Abstracts from the ASA 38th Annual Conference
13 – 16 April 2013
San Antonio, Texas

The merged journal of the American Society of Andrology and the European Academy of Andrology, now including the former International Journal of Andrology and Journal of Andrology
Abstracts from the 38th American Society of Andrology Annual Meeting
13 – 16 April 2013
San Antonio, Texas

Disclaimer: This abstracts book has been produced using author-supplied copy. Editing has been restricted to some corrections of spelling and style where appropriate. No responsibility is assumed for any claims, instructions, methods or drug dosages contained in the abstracts: it is recommended that these are verified independently.
ASA 38th Annual Conference  
April 13 – 16, 2013

XXII North American Testis Workshop  
April 10 – 13, 2013

Andrology Lab Workshop  
April 13 – 14, 2013

ASA Special Symposium  
April 13, 2013

Andrology in Uniform Mini-Symposium  
April 16, 2013

ASA 38th Annual Meeting  
“Andrology at the Heart of Health and Disease”  
April 13 – 16, 2013

Hyatt Regency San Antonio  
San Antonio, Texas

Program Chairs: John K. Amory, MD and Vassilios Papadopoulos, PhD

Location: Regency East 1 – 3

FRIDAY, APRIL 12, 2013
7:00 a.m. – 6:00 p.m.  
Registration
Location: Los Rios Foyer

SATURDAY, APRIL 13, 2013
7:00 a.m. – 8:00 a.m.  
Breakfast
Location: Regency East Foyer

7:00 a.m. – 7:00 p.m.  
Registration
Location: Los Rios Foyer

4:00 p.m. – 9:30 p.m.  
Exhibit Hall Open
Location: Rio Grande Ballroom

8:00 a.m. – 9:00 a.m.  
AUA LECTURE
A Non-Invasive Progenitor Cell Therapy on the Erectile Dysfunction of Diabetic Rats
Tom F. Lue, MD  
University of California-San Francisco
(Introduced by Ajay K. Nangia, MBBS)

9:00 a.m. – 9:15 a.m.  
Distinguished Service Award

9:15 a.m. – 10:45 a.m.  
SYMPOSIUM I – Hypogonadism and Metabolism
Co-chairs: George L. Gerton, PhD  
Christina Wang, MD

11:00 a.m. – 12:30 p.m.  
Poster Session I
Location: Regency West 4 – 6

12:30 p.m. – 2:00 p.m.  
Lunch (on your own)
Riverwalk / Shops at Paseo del Alamo
SUNDAY, APRIL 14, 2013 (continued)

12:30 p.m. – 2:00 p.m.  MENTORING LUNCHEON
SPONSORED BY THE
DIVERSITY AND TRAINEE
AFFAIRS COMMITTEES
Location: Pecan
“Diversity’ in Andrology: Why/
How/What/Who?”
George L. Gerton, PhD
Co-Chair of Trainee Affairs
and Diversity Committees
(not included in registration; tickets
required)

12:30 p.m. – 2:00 p.m.  Editorial Board Luncheon
Location: Medina

2:00 p.m. – 3:30 p.m.  ORAL SESSIONS
Oral Sessions I: New Insights in
Clinical Andrology
Location: Regency East 1 – 3
Moderators: Leslie Lynn Heckert,
PhD
Kansas City, KS
Elizabeth Snyder, PhD
Bar Harbor, ME

Oral Session II: Novel Aspects of
Male Reproductive System
Development and Sperm Function
Location: Live Oak
Moderators: Patricia S. Cuasnicu,
PhD
Buenos Aires
Carolina Jorgez, PhD
Houston, TX

3:30 p.m. – 3:50 p.m.  BREAK
Location: Rio Grande Ballroom

3:50 p.m. – 4:00 p.m.  PRESIDENT’S MERIT AWARD

4:00 p.m. – 4:45 p.m.  LECTURE I
Functional Amyloid in the
Reproductive Tract
Gail A. Cornwall, PhD
Texas Tech University
(Introduced by Barry T. Hinton, PhD)

LECTURE II
Human Gamete Recognition in
Transgenic Mice
Jurrien Dean, MD
NIDDK, NIH
(Introduced by Vassilios
Papadopoulos, PhD)

6:00 p.m. – 8:00 p.m.  TRAINEE FORUM AND MIXER
(All Trainee Travel Awards will be
distributed and celebrated at this
event)
Location: Garden Terrace

MONDAY, APRIL 15, 2013

7:00 a.m. – 8:00 a.m.  BREAKFAST
Location: Rio Grande Ballroom

7:00 a.m. – 3:30 p.m.  EXHIBIT HALL OPEN
Location: Rio Grande Ballroom

7:00 a.m. – 6:00 p.m.  REGISTRATION
Location: Los Rios Foyer

8:00 a.m. – 9:00 a.m.  WOMEN IN ANDROLOGY
LECTURE
DNA Methylation in the Germline
During Development
Jacquetta M. Trasler, MD, PhD
McGill University
(Introduced by Dolores J. Lamb, PhD)

9:00 a.m. – 9:15 a.m.  YOUNG ANDROLOGIST AWARD

9:15 a.m. – 10:45 a.m.  SYMPOSIUM II – TESTOSTERONE
Target Tissues in the Body
Co-chairs: Patricia L. Morris, PhD
J. Lisa Tenover, MD, PhD

Interaction Between Androgen
and RUNX Signaling in Bone and
Prostate Cancer
Baruch Frenkel, DMD, PhD
University of Southern
California

Castrate-Resistant, But Testosterone
Sensitive, Cells in Primary Prostate
Tumors are Stem Cell-Like and
Cancer Repopulating
Gail Risbridger, PhD
Monash University

Testosterone at the Heart of Disease
– The Association Between
Testosterone and Cardiovascular
Events
Molly Shores, MD
VA Puget Sound Health Care
System

10:45 a.m. – 11:00 a.m.  BREAK
Location: Rio Grande Ballroom

11:00 a.m. – 12:30 p.m.  POSTER SESSION II
Location: Regency West 1 & 2

12:30 p.m. – 2:00 p.m.  LUNCH (ON YOUR OWN)
### SCHEDULE AT A GLANCE

**MONDAY, APRIL 15, 2013 (continued)**  
**12:30 p.m. – 2:00 p.m.**  
**WOMEN IN ANDROLOGY LUNCHEON AND DISCUSSION**  
*Location: Pecan*  
*When the Going Gets Tough … Moving Past Burnout*  
*Moderator:* Elizabeth Snyder, PhD  
*Panelists:* Dolores J. Lamb, PhD  
Sophie La Salle, PhD  
Elizabeth Snyder, PhD  
(not included in registration fee; tickets required)

**2:00 p.m. – 3:30 p.m.**  
**SYMPOSIUM III – Hormones and Drugs Regulating Testis Function**  
*Co-chairs:* Keith A. Jarvi, MD  
Kate Loveland, PhD  
*Diverse Role of Prolactin in Male Sexual Behavior and Reproduction*  
Darius A. Paduch, MD, PhD  
Cornell University  
*Endocrine Regulation of Male Fertility by the Skeleton*  
Gerard Karsenty, MD, PhD  
Columbia University  
*Tyrosine Kinase Inhibitors and the Testis*  
Lucio Gnnessi, MD, PhD  
Sapienza University

**3:30 p.m. – 4:00 p.m.**  
**Break**  
*Location: Rio Grande Ballroom*

**4:00 p.m. – 4:45 p.m.**  
**LECTURE III:**  
*Androgen in Health and Disease*  
Shalender Bhasin, MD  
Boston University  
*TALENTED Lecture:*  
Development and Biology of Human Germ Cells: Lessons from Testicular Neoplasms  
Ewa Rajpert-De Meyts, MD, PhD  
Copenhagen University  
(Introduced by Robert E. Brannigan, MD)

**4:45 p.m. – 5:30 p.m.**  
**EAA LECTURE:**  
Environment and Male Reproductive Health: Epidemiologic Evidence and its Interpretation  
Russ Hauser, PhD  
Harvard University  
*Environment and Sperm Aneuploidy*  
Melissa Perry, ScD, MHS  
George Washington University  
*Rethinking the Anti-Oxidant System in Spermatozoa*  
Cristian O’Flaherty, PhD  
McGill University  
*MEETING ADJOURNED*  

**TUESDAY, APRIL 16, 2013**  
**7:00 a.m. – 8:00 a.m.**  
**2014 Program Committee Meeting**  
*Location: Chula Vista Boardroom*

**7:30 a.m. – 8:30 a.m.**  
**Breakfast**  
*Location: Regency East Foyer*

**7:00 a.m. – 12:15 p.m.**  
**Registration**  
*Location: Los Rios Foyer*

**8:00 a.m. – 9:30 a.m.**  
**SYMPOSIUM IV – Infection and Immunity**  
*Co-chairs:* Kirk C. Lo, MD, FRCS, C  
Pablo E. Visconti, PhD  
*HPV Vaccine in Males*  
Anna R. Giuliano, PhD  
Moffitt Cancer Center  
*Sexually Transmitted Infections and Infertility*  
Deborah J. Anderson, PhD  
Harvard University  
*HIV and Other Pathogens in the Male Reproductive Tract*  
Ann A. Kiessling, PhD  
Harvard University

**9:30 a.m. – 9:45 a.m.**  
**Break**  
*Location: Regency East Foyer*

**9:45 a.m. – 10:45 a.m.**  
**INTERNATIONAL LECTURE:**  
Infertile, Fat and Wheezy – RABL2 Function  
Moira K. O’Bryan, BSc, PhD  
Monash University  
(Introduced by Marie-Claude Hofmann, PhD)

**10:45 a.m. – 12:15 p.m.**  
**SYMPOSIUM V – Environment, Metabolism and Fertility**  
*Co-chairs:* Peter Chan, MD  
John H. Richburg, PhD  
*Environment and Male Reproductive Health: Epidemiologic Evidence and its Interpretation*  
Russ Hauser, PhD  
Harvard University  
*Environment and Sperm Aneuploidy*  
Melissa Perry, ScD, MHS  
George Washington University  
*Rethinking the Anti-Oxidant System in Spermatozoa*  
Cristian O’Flaherty, PhD  
McGill University

**5:30 p.m.**  
ASA Business Meeting, Outstanding Trainee Investigator and Trainee Awards

**6:30 p.m.**  
Buses depart from Lobby for Banquet

**7:00 p.m. – 11:00 p.m.**  
**Annual Banquet**  
(Not included in registration fee; tickets required)  
*Location: The Buckhorn Saloon and Museum*

**Disclaimer Statement**  
Statements, opinions and results of studies contained in the program are those of the presenters/authors and do not reflect the policy or position of the ASA. No the ASA provide any warranty as to their accuracy or reliability.

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Andrology, 2013, 1 (Suppl. 2), 3
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule at a Glance</td>
<td>1</td>
</tr>
<tr>
<td>President’s Welcome</td>
<td>5</td>
</tr>
<tr>
<td>Past Presidents</td>
<td>5</td>
</tr>
<tr>
<td>ASA Officers</td>
<td>6</td>
</tr>
<tr>
<td>General Information</td>
<td>7</td>
</tr>
<tr>
<td>Special Events</td>
<td>9</td>
</tr>
<tr>
<td>Message from the Program Co-Chairs</td>
<td>10</td>
</tr>
<tr>
<td>ASA Lecturer Award</td>
<td>11</td>
</tr>
<tr>
<td>Distinguished Andrologist Award</td>
<td>12</td>
</tr>
<tr>
<td>Distinguished Service Award</td>
<td>13</td>
</tr>
<tr>
<td>Young Andrologist Award</td>
<td>14</td>
</tr>
<tr>
<td>President’s Merit Award</td>
<td>15</td>
</tr>
<tr>
<td>Outstanding Trainee Investigator Award</td>
<td>15</td>
</tr>
<tr>
<td>Thanks to Promotional Partner</td>
<td>15</td>
</tr>
<tr>
<td>Thanks to Donors &amp; Sponsors</td>
<td>16</td>
</tr>
<tr>
<td>Course Objectives &amp; CME Credit Information</td>
<td>17</td>
</tr>
<tr>
<td>Schedule of Events</td>
<td>19</td>
</tr>
<tr>
<td>Speaker Abstracts</td>
<td>29</td>
</tr>
<tr>
<td>Poster Session I</td>
<td>38</td>
</tr>
<tr>
<td>Poster Session II</td>
<td>44</td>
</tr>
<tr>
<td>Index of Abstract Authors</td>
<td>51</td>
</tr>
<tr>
<td>Abstracts Full Text</td>
<td>56</td>
</tr>
<tr>
<td>Committee Listing</td>
<td>107</td>
</tr>
</tbody>
</table>
PRESIDENT’S WELCOME

It is my great pleasure to welcome you to the 38th Annual Meeting of the American Society of Andrology. The city of San Antonio, Texas, is rich in culture and history. Founded in 1718 as San Antonio de Béxar, it continues as a window into the Spanish colonial heritage of the American southwest. From early missions to the Alamo to landmark hotels and restaurants, history will be alive all around you. At the same time, San Antonio offers a wealth of arts, entertainment, and of course, the River Walk.

Our meeting may keep you too busy to do much exploring, though. The meeting is always a great opportunity to hear about the latest advances and controversies in your own field and learn what’s new in related areas. This year’s theme is “Andrology at the Heart of Health and Disease.” Reproduction doesn’t exist in isolation. Program Co-Chairs Vassilios Papadopoulos and John Amory and their Committee have organized an intellectual grand tour of how the reproductive system interacts with its surroundings. In some cases, speakers will explore effects of androgens, for example, on somatic systems. In others, they will address how other organ systems affect male reproductive biology. Nine lectures, including five major named lectures, will review advances in topics from systems genomics, basic sperm biology, fertilization, and testis development, to amyloidosis in the reproductive tract, androgen action and therapy, and erectile dysfunction.

Five Symposia convey the breadth of the theme: Hypogonadism and Metabolism, Testosterone Target Tissues in the Body, Hormones and Drugs Regulating Testis Function, Infection and Immunity and Environment, Metabolism and Fertility. Two oral sessions and two poster sessions feature presentations selected from submitted abstracts.

Several extra events frame the ASA main program. The XXII North American Testis Workshop, “The Foundations of Male Fertility,” will precede our Annual Meeting from April 10 – 13. On Saturday, just ahead of the main program, a special symposium, “Innovations in Men’s Health” will feature five clinical-translational sessions. The Andrology Lab Workshop Saturday and Sunday, will focus on “Semen Analysis Quality Control.” Following last year’s example, a mini-symposium, “Andrology in Uniform,” will follow the Annual Meeting on Tuesday afternoon, highlighting some under-researched reproductive health issues of servicemen and veterans.

The Annual Meeting offers many opportunities for career networking and connecting. The Mentoring Luncheon, sponsored by the Trainee Affairs and Diversity Committees, will pose the question, “Diversity in Andrology: Why/How/What/Who?” All are welcome at the Trainee Forum and Mixer, we will present the trainee travel awards and recognize the awardees and their mentors. At the Women in Andrology Luncheon, a panel of women from different career stages will discuss “When the Going Gets Tough…Moving Past Burnout.” Relax and socialize at the Welcome Reception, and don’t miss the Annual Banquet in the 1881 Buckhorn Saloon and Museum, where antlers and rattlesnake rattles were once traded for drinks.

Our annual meeting reflects the strength of our membership – you. With its manageable size and diversity of interests, the meeting is a rich marketplace of ideas, discussions, collaborations and opportunities. Innovation in science comes from bringing concepts and approaches together in new ways. A vibrant and diverse biomedical workforce comes from exposing students and trainees to investigators doing cutting-edge research. Join us in advancing research in basic, translational and clinical andrology through a meeting that is intellectually stimulating and professionally rewarding.

Donna L. Vogel, MD, PhD
President, American Society of Andrology

PAST PRESIDENTS OF THE AMERICAN SOCIETY OF ANDROLOGY

<table>
<thead>
<tr>
<th>Year</th>
<th>President</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975-77</td>
<td>Emil Steinberger*</td>
</tr>
<tr>
<td>1977-78</td>
<td>Don W. Fawcett*</td>
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<td>1978-79</td>
<td>C. Alvin Paulsen*</td>
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<td>1979-80</td>
<td>Nancy J. Alexander</td>
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<td>1980-81</td>
<td>Philip Troen</td>
</tr>
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<td>1981-82</td>
<td>Richard M. Harrison</td>
</tr>
<tr>
<td>1982-83</td>
<td>Richard J. Sherins</td>
</tr>
<tr>
<td>1983-84</td>
<td>Andrzej Bartke</td>
</tr>
<tr>
<td>1984-85</td>
<td>Rudi Ansbacher</td>
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<td>1985-86</td>
<td>Anna Steinberger</td>
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<td>1986-87</td>
<td>William D. Odell</td>
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<tr>
<td>1987-88</td>
<td>Larry L. Ewing*</td>
</tr>
<tr>
<td>1988-89</td>
<td>C. Wayne Bardin</td>
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<tr>
<td>1989-90</td>
<td>Rupert Amann</td>
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<tr>
<td>1990-91</td>
<td>Howard Nankin</td>
</tr>
<tr>
<td>1991-92</td>
<td>David W. Hamilton</td>
</tr>
<tr>
<td>1992-93</td>
<td>Ronald S. Swerdloff</td>
</tr>
<tr>
<td>1993-94</td>
<td>Bernard Robaire</td>
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<tr>
<td>1994-95</td>
<td>Glenn R. Cunningham</td>
</tr>
<tr>
<td>1995-96</td>
<td>Marie-Claire Orgebin-Crist</td>
</tr>
<tr>
<td>1996-97</td>
<td>Arnold M. Belker</td>
</tr>
<tr>
<td>1997-98</td>
<td>Terry T. Turner</td>
</tr>
<tr>
<td>1998-99</td>
<td>Richard V. Clark</td>
</tr>
<tr>
<td>1999-2000</td>
<td>Barry T. Hinton</td>
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<tr>
<td>2000-2001</td>
<td>J. Lisa Tenover</td>
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<tr>
<td>2001-2002</td>
<td>Barry R. Zirkin</td>
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<td>Jon L. Pryor</td>
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<td>2003-2004</td>
<td>Gail S. Prins</td>
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<td>2004-2005</td>
<td>William J. Bremner</td>
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<td>2005-2006</td>
<td>Sally Perreault Darney</td>
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<tr>
<td>2006-2007</td>
<td>Christina Wang</td>
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<tr>
<td>2007-2008</td>
<td>Terry R. Brown</td>
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<tr>
<td>2008-2009</td>
<td>Wayne J.G. Hellstrom</td>
</tr>
<tr>
<td>2009-2010</td>
<td>Dolores J. Lamb</td>
</tr>
<tr>
<td>2010-2011</td>
<td>Paul J. Turek</td>
</tr>
<tr>
<td>2011-2012</td>
<td>Gail A. Cornwall, PhD</td>
</tr>
</tbody>
</table>

*Deceased
OFFICERS

President            Donna L. Vogel, MD, PhD
Vice President       Erwin Goldberg, PhD
Secretary            Patricia L. Morris, PhD
Treasurer            Rex A. Hess, MS, PhD
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Kate Loveland, PhD; Clayton, VIC Australia

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George Gerton, PhD; Philadelphia, PA (Co-Chair)

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Membership Committee
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Nominating Committee
Gail A. Cornwall, PhD; Lubbock, TX

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ANDROLOGY, 2013, 1 (Suppl. 2), 6

NOTICE TO READERS
Every effort has been made to ensure that the information printed here is correct; however, details are subject to change.
GENERAL MEETING INFORMATION

Located in the south-central part of the state, San Antonio is Texas’ second-largest city and serves as an economic and cultural gateway to the American Southwest. During the Texas Revolution, San Antonio was the site of several battles, including the battle of the Alamo in 1836. The memorable phrase “Remember the Alamo” became forever known as the rallying cry of the Texas Revolution against Mexico. During the twentieth century, San Antonio became an important military center for the Army and Air Force through both world wars; a distinction which it has retained to this day.

ATTRACTIONS

Tourism thrives in San Antonio and has become one of the city’s leading industries. The famed RiverWalk (Paseo Del Rio) takes visitors along three miles of cool shady pathways lined with unique retail shops, cafes, restaurants and nightclubs. San Antonio’s most famous attraction is also Texas’ top tourist draw: The Alamo. Located on beautifully landscaped grounds in the heart of the city, the attraction includes a museum containing relics and mementos from the Republic of Texas and narration chronicling the fall of the Alamo. The city is home to the four-time NBA champion San Antonio Spurs and the annual San Antonio Stock Show & Rodeo, one of the largest in the country.

SHOPPING

Historic Market Square, the biggest Mexican market outside Mexico, because it’s a must see. Olmos Park is an upscale neighborhood whose 1920s buildings ooze charm. Just a few miles from downtown, it’s an easy escape to tranquil boutiques. The Vineyard Shopping Center in Stone Oak is on the way to the refreshing, picturesque Texas Hill Country. San Antonio has some great vintage, resale stores and flea markets. Treasure hunting at these stores can yield some unusual finds. If it’s outlet shopping you’re looking for, two nearby major outlets are a destination unto themselves, with hundreds of stores.

DINING/NIGHTLIFE

The residents of San Antonio love to eat and as a result, the city offers some excellent and diverse restaurants and dining opportunities. San Antonio’s many restaurants provide a huge range of cuisine, from Greek, Italian and Thai to Caribbean, Irish and Mexican. When the stars come out over the South Texas Plains, it’s time to head to the nightclubs and dance halls. The Main Plaza, in the heart of downtown, has live music all year long, including two-step to a country-western band at the Cowboys Dance Hall, or soak up Tejano’s Latin rhythms at Graham Central Station. San Antonio is home to the revered Jim Cullum Jazz Band and they play live at The Landing on the River Walk.

WEATHER

San Antonio generally has a temperate climate which makes it ideal for visitors. It lies outside the western edge of the humid subtropical climate zone. The average temperature for April is a high of 80 degrees and a low of 58 degrees.

OUTDOOR RECREATION

San Antonio’s parks and gardens offer an escape from urban living and an array of recreational activities. These include horseback riding, hiking, picnicking, fishing and golf. Brackenridge Park is home to the San Antonio Zoo / Zoological Gardens and Aquarium and the Japanese Tea Gardens, making it a good place to relax after visiting some of San Antonio’s top attractions. San Antonio’s Vietnam War Memorial is an enormous bronze statue dedicated to war veterans and soldiers; and countless green spaces, including San Antonio Botanical Gardens, Brackenridge Park, Friedrich Wilderness Park and the Government Canyon State Natural Area.

ARTS & CULTURE

The banks of the San Antonio River have attracted settlers for nearly 300 years, leaving the city with the best aspects of diverse cultures from all around the world. Some of the best museums and art galleries in San Antonio include the Buckhorn Saloon and Museum – containing a collection of oddities, trophy mounts and a wax museum; San Antonio Children’s Museum – a truly interactive experience, with exciting information and hands-on family exhibits; San Antonio’s Witte Museum – showcasing exhibitions with historic information about South Texas culture and natural science; Steves Homestead Museum – a beautiful 19th-century mansion located next to the San Antonio River; the Marion Koogler McNay Art Museum – housing a fine collection of 19th- and 20th-century masterpieces; and the San Antonio Museum of Art – featuring many exquisite Greek and Roman antiquities, folk art and American paintings.

Registration/Information Desk Hours are as follows:

Friday, April 12, 2013:
7:00 a.m. – 6:00 p.m.

Saturday, April 13, 2013:
7:00 a.m. – 7:00 p.m.

Sunday, April 14, 2013:
7:00 a.m. – 6:00 p.m.

Monday, April 15, 2013:
7:00 a.m. – 6:00 p.m.

Tuesday, April 16, 2013:
7:00 a.m. – 12:15 p.m.

Exhibit Hall Hours are as follows:

Saturday, April 13, 2013:
4:00 p.m. – 9:30 p.m.

Sunday, April 14, 2013:
7:00 a.m. – 4:00 p.m.

Monday, April 15, 2013:
7:00 a.m. – 3:30 p.m.
HOTEL INFORMATION

The American Society of Andrology 2013 Annual Conference will be held at the beautiful Hyatt Regency San Antonio in San Antonio, Texas where special room rates have been arranged for meeting attendees.

Hyatt Regency San Antonio
123 Losoya St.
San Antonio, TX 78205
Phone: (210) 222-1234
Fax: (210) 451-6162
Website: http://sanantonioregency.hyatt.com

Room Rate: $190.00/Double Occupancy
Hotel Deadline: March 15, 2013
Reservations: (800) 233-1234

Room Rate
ASA has negotiated a discounted rate of $190.00 plus tax (currently 16.75%) for a double occupancy room at the Hyatt Regency San Antonio Hotel. Additional charges for multiple room occupancy are:

Triple Occupancy – $215.00
Quadruple Occupancy – $240.00

Hotel Deadline
The deadline to receive the ASA group rate is March 15, 2013. ASA encourages you to make your reservation early, as the hotel and discount block may sellout before this date. After this date, reservations will be accepted based on availability and higher rates may apply.

Reservations
Attendees are responsible for making their reservations by calling the hotel at (800) 233-1234. Please reference the ASA to receive the discounted rate.

Hotel Deposit & Cancellation Policy
A deposit equal to one night’s stay is required to hold a reservation. These deposits are fully refundable if the hotel is notified 48-hours prior to arrival and a cancellation number is obtained.

TRAVEL & TRANSPORTATION

Airport Information
San Antonio International Airport is approximately nine miles from the Hyatt Regency San Antonio or 15 minutes by car.

Taxi Cab Services
Several taxi companies operate at the San Antonio International Airport:

Yellow Cab San Antonio (210) 222-2222
National Cab Company (210) 434-4444
San Antonio Taxi (210) 444-2222

Rental Car Information
Avis Rent-A-Car is the official rental car company for the ASA 2013 Annual Meeting. For reservations, please call (800) 331-1600, and use the code “J901055” to receive the discounted rates.

Shuttle Service
The San Antonio International Airport offers shuttle service to the Hyatt Regency San Antonio. Please call (210) 281-9900 or visit www.goairportshuttle.com for more information.

Parking
The Hyatt Regency San Antonio offers self parking for $6 per hour, overnight for $27 with tax and valet parking for $36 per day. Please note that rates are subject to change.

CHILDCARE SERVICES

Northside Sitters serves the Hyatt Regency San Antonio for on-site, 24 hours, 7 days a week childcare. All sitters are trained in CPR and First Aid and have undergone background checks. For more information, visit their website at www.northsidesittersclub.com.
SPECIAL EVENTS

Laboratory Science Forum Luncheon
“Male Reproductive Anatomy and Spermatogenesis: A Primer at the Speed of Light”
Date: Saturday, April 13, 2013
Time: 11:45 a.m. – 1:15 p.m.
Location: Pecan
In this tag-team presentation, Drs. Rex Hess and David Karabinus will be offering a review of basic male reproductive anatomy, of testicular microanatomy as it relates to spermatogenesis and of spermatogenesis. A great opportunity for a review or a first exposure to the anatomy and the processes our society holds so dear. We look forward to your attending this fast-paced and action packed presentation.
Cost: One ticket included in ALW registration; $35.00 for non-ALW registrations. Please sign up for this event on the registration form.

Welcome Reception
Date: Saturday, April 13, 2013
Time: 7:50 p.m. – 9:30 p.m.
Location: Rio Grande Ballroom
Join us for a welcome reception to connect with friends and colleagues. Admission to the reception is included in your ASA registration fee; however, it is not included if you are only attending the Testis Workshop and/or Special Symposium.
Dress: Business casual or casual attire is appropriate
Cost: One ticket included in ASA registration; $25.00 for additional tickets. Please sign up for this event on the registration form.

Mentoring Luncheon Sponsored by the Diversity and Trainee Affairs Committees
“‘Diversity’ in Andrology: Why/How/What/Who?”
Date: Sunday, April 14, 2013
Time: 12:30 p.m. – 2:00 p.m.
Location: Pecan
What do we mean when we use the term “diversity”? Why should we care about “diversity”? How should we address “diversity” in the field of andrology for the betterment of science, medicine and society? Are we speaking about the andrologist doing the research? Are we referring to the subjects of male reproductive health studies? How should we promote “diversity” beyond a trainee-limited focus? What is the ASA doing to promote “diversity”? Dr. Gerton will frame these questions in terms of the five-year grant from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) recently awarded to the ASA to promote diversity within the society.
Speaker: George L. Gerton, PhD
Cost: $10.00 for trainees, $35.00 for non-trainees. Please sign up for this event on the registration form.

Trainee Forum and Mixer
Date: Sunday, April 14, 2013
Time: 6:00 p.m. – 8:00 p.m.
Location: Garden Terrace
The ASA Trainee Forum and Mixer provides the opportunity for trainee members to meet other trainees, as well as, meet with more established members of the society. This is a relaxed, informal event with appetizers, beer and wine provided. Senior members of the society will be present for an informal “forum and discussion group” setting to answer your questions about relevant topics such as grant writing, searching for a post-doc or job, diverse PhD career paths, succeeding in the clinic or lab, etc.
Cost: Complimentary; all members of the society are welcome. Please sign up for this event on the registration form.

Women in Andrology Luncheon and Discussion
“When the Going Gets Tough … Moving Past Burnout”
Date: Monday, April 15, 2013
Time: 12:30 p.m. – 2:00 p.m.
Location: Pecan
Host: Elizabeth Snyder, PhD
Speakers: Dolores J. Lamb, PhD; Sophie La Salle, PhD; Elizabeth Snyder, PhD
Cost: $25.00 for trainees, $35.00 for non-trainees. Please sign up for this event on the registration form.
How does one recognize, cope with and move past challenges in one’s career and continue to thrive in science? Accomplished andrologists along a continuum of academic positions—from post-doc to chairwoman—will discuss coping strategies for those inevitable career phases that feel like an uphill battle. Time will allow for questions and networking with fellow women in andrology.

Annual Banquet
Date: Monday, April 15, 2013
Time: 7:00 p.m. – 11:00 p.m.
Location: The Buckhorn Saloon & Museum
Cost: $75.00 per person, $35.00 for trainees. Includes dinner and entertainment. Buses depart from lobby at 6:30 p.m. Please sign up for this event on the registration form.
MESSAGE FROM THE PROGRAM CO-CHAIRS

Welcome to beautiful and sunny San Antonio for the 38th Annual Meeting of the American Society of Andrology!

The theme of the ASA meeting this year is “Andrology at the Heart of Health and Disease” and provides an opportunity to discuss some of the most pressing questions in reproductive biology and male health. To lead the discussion of these issues, we are fortunate to have a series of presentations by leaders in our field.

The Emil Steinberger Memorial Lecture, which kicks off our 2013 meeting, will be delivered by Deborah O’Brien, PhD of the University of North Carolina at Chapel Hill. Dr. O’Brien’s talk is entitled “Male Fertility: Systems Genetics and Drug Discovery.” Dr. O’Brien is renowned for her 25+ years of work investigating the genetics of male infertility and sperm biology using biochemical, genetic and cellular approaches. The 2013 AUA lecturer will be Tom Lue, MD of the University of California, San Francisco, who will speak on his work in erectile dysfunction. Dr. Lue is internationally renowned for his expertise in this condition, and is widely recognized to be an engaging and entertaining speaker on this topic.

Following these plenary talks, a series of presentations examining the link between hypogonadism and metabolism will take place, including talks on “Hypogonadism and the Metabolic Syndrome,” by Adrian Dobs, MD, MHS, “Hypogonadism and Advanced Cancer,” by Antonio Viganò, MD from McGill University and “The Natural History of Late Onset Hypogonadism – Implications for Clinical Management,” by Frederick Wu, MD from the Manchester Royal Infirmary.

Several presentations highlighting recent developments in basic science will follow. First, Gail Cornwall, PhD will speak on “Functional Amyloid in the Reproductive Tract,” and Jurrien Dean, MD will present a lecture entitled “Human Gamete Recognition in Transgenic Mice.” There will be a symposium that highlights the effect of testosterone on target tissues in the body featuring talks by Barnach Frenkel, MD, PhD on “Interactions between Androgen and RUNX2 Signaling in Bone and Prostate Cancer,” as well as one by Gail Risbrider, PhD on “Castrate-Resistant, But Testosterone Sensitive, Cells in Primary Prostate Tumors are Cell-Like and Cancer Repopulating,” followed by a presentation by Molly Shores, MD on the “Testosterone at the Heart of Disease – The Association between Testosterone and Cardiovascular Events.” In the third symposium, Darius Paduch, MD, PhD will present on the “Diverse Role of Prolactin in Male Sexual Behavior and Reproduction” and Gerard Karsenty, MD, PhD will speak on the “Endocrine Regulation of Male Fertility by the Skeleton,” and Lucio Gnessi will present on “Tyrosine Kinase Inhibitors and the Testes.”

This year’s Women in Andrology lecture will be given by Dr. Jacqueta Trasler, MD, PhD on the “DNA Methylation in the Germline During Development.”

Following this symposium, Shalender Bhasin, MD, will give a lecture on “Androgens in Health and Disease” and Ewa Rajpert-De Meyts, MD, PhD will give the European Andrology Association Lecture entitled “Development and Biology of Human Germ Cells: Lessons from Testicular Neoplasms.” The final two symposiums will take place on Tuesday are feature presentations on the relationship between infectious diseases and the environment and male health. In the morning, Anna R. Giuliano, PhD will speak on the “HPV Vaccine in Males” and Deborah Anderson, PhD will speak on “Sexually Transmitted Infections and Infertility,” followed by a presentation by Ann A. Kiessling, PhD on “HIV and Other Pathogens in the Male Reproductive Tract.” Moira O’Bryan, PhD will then present the ASA International Lecture on the relationship of obesity and male infertility. The final symposium features presentations from Russ Hauser, PhD on “Environmental and Male Reproductive Health: Epidemiologic Evidence and its Interpretation,” Melissa Perry, ScD, MHS speaking on “Environment and Sperm Aneuploidy” and Dr. Christian O’Flaherty PhD speaking on “Rethinking the Anti-Oxidant System in Spermatozoa.”

An important feature of the annual meeting are the platform and poster sessions, which are drawn from the over 100 abstracts submitted to the meeting. The two concurrent oral sessions will have six speakers each. The first oral session is focused on “New Insights in Clinical Andrology” and the other oral session is entitled “Novel Aspects of Male Reproductive System Development and Sperm Function” and will have a more basic science focus. Two poster sessions—one on Sunday and one on Monday—will round out the meeting. Both the platform and poster sessions permit delegates to share their most recent research, and are particularly exciting for the trainees. Please be sure to come out and see the work of the up-and-comers in the field of andrology.

The ASA annual meeting is significantly enhanced by numerous satellite meetings and supplemental activities. We are extremely grateful to our colleagues who organize these events. The annual meeting this year is preceded by three different events: a Symposium on innovations in men’s health, the annual Andrology Lab Workshop on semen analysis quality control, organized by Steven M. Schrader, PhD and Susan A. Rothmann, PhD, HCLD, and the XXII North American Testis Workshop entitled “The Foundations of Male Fertility” and organized by William Wright, PhD.

Complementing these scientific activities is a selection of events for networking, career development, discussion and socializing. These include: the lab science forum luncheon—while we discuss basic male reproductive anatomy, of testicular microanatomy as it relates to spermatogenesis and of spermatoogenesis—the mentoring luncheon, the trainee forum and mixer, which includes honoring the winners of the Trainee Travel and International Travel awards, and the Women in Andrology Luncheon, which celebrates the contributions of female investigators and clinicians in male reproduction biology and health. We also hope that you’ll have some opportunity to enjoy our meeting site. The climate and scenery of San Antonio should inspire you to enjoy time with your colleagues and friends out and about. In particular, the Alamo in downtown San Antonio is worth a visit.

We thank ASA president Donna L. Vogel, MD, PhD for offering us this special opportunity to chair the organization of the 2013 annual meeting. It has been a distinct honor and pleasure to serve the society in this way. We are grateful for the input and advice from the andrology community and especially from our Program Committee members listed on the following page.

In addition, we offer special thanks for those who were especially helpful with review of abstracts: Thomas Walsh, MD, Bradley Anawalt, MD, Darius Paduch, MD, Ajay Nangia, MBBS, Janice L. Bailey, PhD, Alan Diekman, PhD, Janice P. Evans, PhD, Barry T. Hinton, PhD, Kate Loveland, PhD, Cristian O’Flaherty, PhD and Bernard Robaire, PhD. Last, but not least, none of this would have been possible without the support of the ASA Executive Office and WJ Weiser and Associates. We very much appreciate all the help and support that we received in putting this meeting together, and now sincerely hope that you’ll enjoy the meeting!

Vasilios Papadopoulos, DPharm, PhD
John K. Amory, MD, MPH
EMIL STEINBERGER MEMORIAL LECTURE AWARD

Deborah O’Brien, PhD, is a professor in the department of cell biology & physiology and the department of pediatrics at the University of North Carolina School of Medicine in Chapel Hill. She is also a member of the laboratories for reproductive biology, the curriculum in genetics and molecular biology and the Lineberger Comprehensive Cancer Center at UNC. Dr. O’Brien’s lab investigates molecular and cellular mechanisms that regulate spermatogenesis, sperm motility and fertilization. A major focus of her current research is sperm energy metabolism, particularly the function of glycolytic isozymes with restricted expression in the male germline. Her translational studies examine sperm metabolism in infertile patients and use structure-based drug design to develop selective GAPDHs inhibitors as potential contraceptives. She also investigates male reproductive function in mouse lines that are becoming extinct during the generation of recombinant inbred strains in the Collaborative Cross, with the goal of identifying genetic causes of male infertility. Dr. O’Brien received her BS degree in biology from the University of Dayton and her PhD in physiology from Harvard. She joined the faculty at the University of North Carolina at Chapel Hill after completing postdoctoral studies at Harvard Medical School and the National Institute of Environmental Health Sciences. As an active member of ASA, Dr. O’Brien has served on the Executive Council, the Editorial Board of the Journal of Andrology and multiple committees including chairmanship of the 2004 Program Committee. She has presented her work in several invited lectures at national and international meetings, including the ASA Women in Andrology lectureship. Her service to the reproductive biology community also includes three years as an associate editor of Biology of Reproduction, as well as participation in multiple NIH grant review panels, several committees of the Society for the Study of Reproduction, and the organizing committees for six North American Testis Workshops.

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DISTINGUISHED ANDROLOGIST AWARD

Christina Wang, MD, is this year’s recipient of the American Society of Andrology Distinguished Andrologist Award. Christina received her MD degree in 1974 from University of Hong Kong. She is currently professor of medicine and assistant dean of clinical and translational sciences at the David Geffen School of Medicine at UCLA. She was a former professor of medicine and chief of endocrinology at University of Hong Kong. In 1989, she moved to Los Angeles, CA, as a professor of medicine in residence at Cedars Sinai Medical Center, UCLA School of Medicine. In 1993, she was recruited to Harbor-UCLA Medical Center & LA Biomedical Research Institute, where she developed and outstanding medical and scientific career as director of the General Clinical Research Center and now served as the associate director of the UCLA-Clinical and Translational Science Institute. Christina led a variety of funded basic and clinical research studies and her current research interest include androgen replacement therapy, hormonal male contraceptive development, diet and androgen metabolism, aging in men and environment effects on sperm quality. She has been incredibly productive, authoring more than 310 peer-reviewed publications including review articles, 67 chapters in books including the Cecil’s Textbook of Medicine, Campbell’s Urology and The Leydig Cells, and over 240 abstracts. Christina has demonstrated her outstanding teaching skills with generations of students, residents and fellows. She is a world leader in andrology and devoted her time also working at the World Health Organization (WHO) as chairperson of the task force on methods for the regulation of male fertility and as chair and member of the expert group that edited the last three editions of the WHO laboratory manual on semen analyses. She also served as special consultant for the United Nations (UN) for the UN Family Planning Association to review candidate centers, foster high quality research and monitor progress in developing countries.

Christina is an active member of ASA serving in many ways as council member (1992 – 1995), chair of the post-graduate course (1999) and of the annual meeting program (2005) chair and participating in the Award Committee (1997 – 1998). Then, as vice president (2005 – 2006) and president (2006 – 2007). She also committed her time for the International Society of Andrology serving as secretary (2001 – 2005), member of the Executive Committee (2001 – 2005), of the Program Organizing Committee (1997 – 2005) and as chair of the Program Organizing Committee (2005 – 2009), culminating with her election as the ISA president (2009 – 2013). Christina has contributed with these societies as associate editor of the International Journal of Andrology and served on the editorial board of the Journal of Andrology (1994 – 1997). She is currently on the editorial board of the Journal of Clinical Endocrinology and Metabolism. Christina is an outstanding scientist, leader and spokesperson for andrology; she was invited to give more than 100 lectures worldwide and she has been recognized by her colleagues and institutions with numerous awards including the ASA Distinguished Service award in 2011.

For these, as well as many other accomplishments not listed here, Dr. Wang is this year’s deserving recipient of the Distinguished Andrologist Award.

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DISTINGUISHED ANDROLOGISTS

1975  Roy O. Greep & M.C. Chang
1976  Robert E. Mancini
1977  Robert S. Hotchkiss
1978  Thaddeus Mann
1979  John MacLeod
1980  Alexander Albert
1981  Eugenia Rosemberg
1982  Kristen B.D. Eik-Nes
1983  Mortimer B. Lipsett
1984  Robert H. Foote
1985  Alfred D. Jost
1986  Emil Steinberger
1987  Yves W. Clermont
1988  C. Alvin Paulsen
1989  Marie-Claire Orgebin-Crist
1990  Philip Troen
1991  C. Wayne Bardin
1992  Anna Steinberger
1993  Richard J. Sherins
1994  Rupert P. Amann
1995  J. Michael Bedford
1996  Brian P. Setchell
1997  Ryuzo Yanagimachi
1998  Richard D. Amelia
1999  Bayard T. Storey
2000  Frank S. French
2001  Geoffrey M. H. Waites
2002  David M. de Kretser
2003  Ronald Swerdloff
2004  Mitch Eddy
2005  Norman Hecht
2006  Eberhard (Ebo) Nieschlag
2007  Bernard Robaire
2008  William Bremner
2009  Dolores Lamb
2010  Barry Zirkin
2011  Erwin Goldberg

The Distinguished Andrologist Award is sponsored by the American Society of Andrology.
Distinguished Service Award

The Distinguished Service Award recognizes an individual for their service contributions to the American Society of Andrology. Dr. Rex Hess, professor emeritus, department of comparative biosciences, University of Illinois, is this year’s recipient of the American Society of Andrology Distinguished Service Award. Rex has made many important contributions to the science of andrology, has been actively involved in teaching and supervision and he provided valuable teaching and research tools for the study of spermatogenesis. In addition to these contributions, Rex has had an outstanding career of service and we are thankful to him that he has chosen to focus most of his time in this area on serving the American Society of Andrology.

Over the past thirty years, Rex has been serving our society in different ways and taking active role in key committees. As secretary of the society (1995 – 1998), Rex undertook the major task of digitizing all the minutes of all council meetings since the inception of the society that he has maintained and made available to all appropriate persons. This remarkable resource has turned out to be extremely valuable given the turnover of council members and the frequent return of previously discussed issues. Recently, Rex has accepted the position of treasurer in our society (2011 – 2014). As with all other jobs he has undertaken, he is doing this task with great care and concern for the good of ASA. Rex has also accepted the responsibility of “ASA archivist” and chair the Archives Committee for the past twelve years! He has sought and collected all information about previous meetings and council activities of the society and is developing a comprehensive archive. He also served as chair of the Education Policy Committee (1993 – 1994) and of the Trainee Affairs Committee (2003 – 2005), and as a member of the Minority Affairs Committee (1997), Awards Committee (~1996 – 1998; 2005 – 2007), Nominations Committee (2002 – 2003); Executive Council (2005 – 2008).

Rex has contributed to the journal’s success in many ways. He is one of the longest serving and most active members of the Editorial Board, serving in two periods (1997 – 2003 and 2007 – 2012). Several editors-in-chief can attest the diligence and thoroughness with which Rex reviews manuscripts and thereby contributes to the scientific reputation of our journal. Furthermore, as an active member of the Publications Committee (2000 – present) as a member of the new Journal Oversight Committee for andrology (2012 – present), he helped shepherd the recent transition. Rex’s expertise as a reviewer has been sought by many leading journals. He has served on the editorial board of Domestic Animal Endocrinology, and is currently serving on the editorial boards of Tissue and Cell, Animal Reproduction, Reproductive Biology & Endocrinology, and Biology of Reproduction. His experience in publications was invaluable in presenting issues for the council to consider at the time of making the merger between the Journal of Andrology and the International Journal of Andrology a reality. For his tireless service to our society, the ASA gratefully recognizes Dr. Rex Hess with the 2013 Distinguished Service Award.

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Andrology, 2013, 1 (Suppl. 2), 13

DISTINGUISHED SERVICE AWARD RECIPIENTS

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<tr>
<th>Year</th>
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<tr>
<td>1993</td>
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<td>2011</td>
<td>Terry R. Brown</td>
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Jacques Tremblay, PhD is the recipient of the 2013 American Society of Andrology Young Andrologist Award. Dr. Tremblay is full professor at the department of obstetrics, gynecology, and reproduction, faculty of medicine, Laval University, Quebec, Canada. He earned his PhD in molecular biology from the University of Montréal in 1998 under the supervision of Dr. Jacques Drouin. Then, he pursued postdoctoral studies at the CHUL Research Centre under the supervision of Dr. Robert Viger. Jacques’ postdoc was very productive and innovative and he made significant contributions to the field of male reproduction in that period; a hallmark of his work was the first demonstration of the role of GATA4 as an important target for hormonal signaling in Leydig cells. The hormonal signaling in steroidogenic cells continues to be an active component of his research program as an independent investigator. In 2003, Jacques initiated his lab at Laval University and since then, he has continuously been funded from different agencies including the Canadian Institutes of Health Research and Natural Sciences and Engineering Research Council of Canada. Jacques has demonstrated his qualities as mentor for more than 41 students at the undergraduate and graduate levels. Many of his trainees have received presentation awards for their work from different societies including our ASA. In addition to his research, Jacques also maintains an important teaching activity that includes a course in research ethics that draws upon his expertise and training in law. He is also committed to the scientific community by being member of the editorial boards of Biology of Reproduction and Andrology, and serving actively in the peer-review of the funding agencies in Canada and abroad. He was recently been elected as a member of the Executive Council of ASA, is chair of the Publications and Communications Committee, and a member of the ASA Program and Nominating committees. Jacques also volunteers his time by serving on multiple committees for the Society for the Study of Reproduction. The numerous awards that Jacques has received in his short career confirmed his qualities as a scientist in the field of reproductive biology. There is no doubt that Jacques is developing an outstanding scientific career recognized by peers in Canada and worldwide. For his accomplishments and his scientific and mentor qualities, the ASA is proud to recognize Dr. Jacques Tremblay as this year’s recipient of the Young Andrologist Award.

YOUNG ANDROLOGIST AWARD

YOUNG ANDROLOGIST AWARD RECIPIENTS

1981 L.J.D. Zaneveld
1982 William B. Neaves
1983 Lonnie D. Russell
1984 Bruce D. Schanbacher
1985 Stephen J. Winters
1986 Ilpo T. Huhtaniemi
1987 Larry Johnson
1988 Barry T. Hinton
1989 Luis Rodriguez/Rigau
1990 Patricia M. Saling
1991 Gary R. Klinefelter
1992 Robert Chapin
1993 Wayne J.G. Hellstrom
1994 Christopher DeJonge
1995 Paul S. Cooke
1996 Gail A. Cornwall
1997 William R. Kelce
1998 Stuart E. Ravnik
1999 Matthew P. Hardy
2000 Jacquetta Trasler
2001 Christopher L.R. Barratt
2002 Joanna E. Ellington
2003 Kate Loveland
2004 Janice Bailey
2005 Janice P. Evans
2006 John K. Amory
2007 Moira K. O’Bryan
2008 Michael A. Palladino
2009 Peter Liu
2010 Humphrey Yao
2011 Wei Yang

The Young Andrologist Award is sponsored by the Texas Institute for Reproductive Medicine and Endocrinology, PA

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PRESIDENT’S MERIT AWARD

A special President’s Merit Award is being given to Dr. Marvin Meistrich to recognize his exceptional and longstanding dedication to the American Society of Andrology in support of the Journal of Andrology and its transformation into our new journal, Andrology. As chair of the ASA Publications Committee (2006 – 2011), he not only strengthened the journal, but also facilitated the transition to electronic publishing. Merger of ASA’s journal with the European Academy of Andrology’s International Journal of Andrology had been proposed a number of times but a variety of obstacles had never been overcome. As Publications Committee chair, Marv worked diligently and effectively with the leadership of both societies to make it happen, and established a new Journal Oversight Committee, which he now chairs. This important achievement for both societies would not have been possible without Marv’s talents and effort, which we recognize with this special award. ASA is grateful for Marv’s generous service in continually improving our Journal, and being the driving force behind the birth of Andrology.

Marv is well known to ASA and renowned for his many scientific contributions to the field of andrology as well as his active role in promoting our journal. A professor in the department of experimental radiation oncology, division of radiation oncology, the University of Texas MD Anderson Cancer Center in Houston, Marv has had a distinguished research career. His many publications have provided fundamental new knowledge about spermatogenesis and sperm chromatin structure, which have been translated into clinical applications for the betterment of men’s reproductive health. His laboratory has broken new ground in fertility preservation for cancer patients. Based on the early studies on the impact of radiation on spermatogenesis he went on to characterize mechanisms of testicular recovery and resilience and explore strategies for protecting the testes from damage during radiation therapy. He has published prolifically over the years, with many of his seminal papers appearing in the Journal of Andrology. He has also trained dozens of graduate students, postdoctoral fellows and medical residents, many of whom have remained active in ASA and continue to conduct andrological research.

The American Society of Andrology acknowledges and celebrates Marv’s many contributions to the ASA and honors him with this special ASA President’s Merit Award.

OUTSTANDING TRAINEE INVESTIGATOR AWARD

The Outstanding Trainee Investigator Award is given to the ASA trainee member with the best abstract and research presentation at the annual meeting. The award encourages trainee members to submit and present their best work and contribute to the scientific excellence of the society.

The recipient of the 2013 Outstanding Trainee Investigator Award will be announced during the Annual Business Meeting on Monday, April 15, 2013 at 5:30 p.m.

NEW INVESTIGATOR AWARD RECIPIENTS

1983  Thomas T. Tarter
1984  Peter S. Albertson
1985  Randall S. Zane
1986  Mark A. Hadley
1987  Peter Grosser
1988  Stuart E. Ravnik
1989  Tracy L. Rankin
1990  Donna O. Bunch
1991  Robert Viger
1992  John Kirby
1993  Michael A. Palladino
1994  Linda R. Johnson
1995  Mehdi A. Akhondi
1996  Wei Gu, Daniel B. Rudolph
1997  Loren D. Walensky
1998  Dolores D. Mruk
1999  Jacques J. Mrkuk
2000  Jeffrey J. Lysiak
2001  Alexander T.H. Wu
2002  Ebtesam Attaya
2003  Mustafa Faruk Usta

OUTSTANDING TRAINEE INVESTIGATOR AWARD RECIPIENTS

2004  Darius Paduch
2005  Tara Barton
2006  Liwei Huang
2007  Steve Tardif
2008  Duangporn Jamsai
2009  Catherine Itman
2010  Michael Elliott
2011  Matthew Marcello
2012  Andrew Major

THANK YOU TO OUR 2013 PROMOTIONAL PARTNER

Silver Level Package
Actavis
THANK YOU TO DONORS & SPONSORS

The American Society of Andrology gratefully acknowledges these contributors to the various ASA Endowment or Asset Funds:

Gold Level
(Multiple or single contribution(s) greater than or equal to $10,000)
James Nelson, III, MD
Richard Sherins, MD
Anna Steinberger, PhD
Bayard T. Storey, PhD
Buckeye Urology & Andrology, Inc.
West Michigan Reproductive Institute
Texas Institute for Reproductive Medicine and Endocrinology

Silver Level
(Multiple or single contribution(s) greater than or equal to $5,000)
Christina Wang, MD
Donna L. Vogel, MD, PhD
Gail S. Prins, PhD
J. Lisa Tenover, MD, PhD
Ronald W. Lewis, MD
Susan Ann Rothmann, PhD, HCLD
Women in Andrology

Sustaining
(Multiple or single contribution(s) greater than or equal to $2,000)
Arnold M. Belker, MD
Bernard Robaire, PhD
Dolores J. Lamb, PhD
Douglas T. Carrell, PhD
E. Mitch Eddy, PhD
Erwin Goldberg, PhD
Frank S. French, MD
Glenn R. Cunningham, MD
Joel L. Marmar, MD
Marc Goldstein, MD
Richard D. Amelor, MD
Richard Van Clark, MD, PhD
Rudi Ansbacher, MD
Rupert P. Amann, PhD
Terry T. Turner, PhD
Wayne J.G. Hellstrom, MD
William J. Bremner, MD, PhD

Annual Contributions for 2012 (through 11/29/12)

1000+
Douglas T. Carrell, PhD
Erwin Goldberg, PhD
Robert W. Hudson, MD, PhD
Ronald W. Lewis, MD
Christina Wang, MD

$250 – $999
J. Lisa Tenover, MD, PhD
Ryuzo Yanagimachi, PhD

$100 – $249
Kate Loveland, PhD
Donna L. Vogel, MD, PhD
Richard Van Clark, MD, PhD
Sarah Kimmins, PhD
Jon Lee Pryor, MD
Rex A. Hess, MS, PhD
Sally Perreault Darney, PhD
Mark Sigman, MD
Barry R. Zirkin, PhD
Wylie C. Hembree, MD
Richard J. Sherins, MD
Christopher J. De Jonge, PhD, HCLD
Andrzej Bartke, PhD
Bayard T. Storey, PhD

$50 – $99
Nancy E. Warner, MD
Martine Culty, PhD
Carin V. Hopps, MD

THANK YOU TO OUR:
2013 ASA Exhibitors
(As of 3/15/13)
Actavis
Coloplast Group
Fertility Technologies Resources, Inc.
Irvine Scientific
Lenus Pharma GesmbH
LifeGlobal/IVFonline.com
ORIGIO, Inc.
SCSA Diagnostics, Inc.
Slate Pharmaceuticals
Spectrum Technologies, Inc.

2013 ASA Educational Grant Providers
American Urological Association, Inc.
Amgen, Inc.
Burroughs Wellcome Fund
Eli Lilly and Company

2013 Contributors
Eli Lilly and Company
ORIGIO, Inc.
EDUCATIONAL NEEDS & OBJECTIVES

38th Annual ASA Meeting
“Andrology at the Heart of Health and Disease”

Needs
Male reproductive health is central to male health. Obviously, male reproductive health encompasses fertility and sexual health, but male reproductive function also impacts metabolism, aging, bone and muscle health, and impacts the risk of obesity, sexually transmitted diseases and cancer. As a result, the modern andrologist needs to integrate physiology, endocrinology, genetics, neurobiology, psychology and consideration of lifestyle and environmental exposures to provide optimal patient care. Adequately fostering such a systems approach to understanding normal reproductive function and related pathologies requires interaction between both clinicians and translational scientists.

To address this objective, the 38th Annual Meeting of American Society of Andrology will permit clinicians and basic scientists to exchange ideas and raise new clinically applicable questions that can lead to novel fundamental research directions. Renowned researchers working in the fields of urology, endocrinology, clinical andrology, genetics, reproductive medicine and reproductive biology will present cutting-edge developments in the physiological and molecular foundations of male reproductive function.

Educational Objectives
- Describe genetic and clinical aspects of male infertility including approaches to treatment and effort towards drug discovery
- Describe our current understanding of the pathophysiology of erectile dysfunction and Peyronie’s disease, including current therapies and future potential therapies.
- Describe the relationship of hypogonadism to the metabolic syndrome, and the impact of aging and advanced cancer on the signs and symptoms of hypogonadism.
- Describe the impact of amyloid deposition in the male reproductive tract.
- Identify the role of the acrosome reaction in fertilization.
- Explain current mechanisms of androgen actions in target tissues, including bone, prostate and the brain.
- Describe the process of DNA methylation in the germline during development and how development impacts the onset of testicular diseases.
- Identify the potential roles of hormones and drugs in the regulation of male fertility.
- Describe the relationship between sexually transmitted diseases including HIV and infertility and other diseases, including the role of vaccination for HPV.
- Describe the relationship between environmental exposures, sperm aneuploidy, resistance to reactive oxidative species and fertility and other aspects of male reproductive health.

ASA SPECIAL SYMPOSIUM

Needs
Issues in men’s health are now becoming more commonly addressed as our understanding of the associated conditions continues to grow. Men’s health issues include sexual dysfunction, prostate cancer and benign prostatic enlargement (BPH), premature ejaculation, and cardiovascular disease and metabolic syndrome. We seek to educate clinicians on the more challenging issues such as PSA screening, testosterone replacement therapy and its impact on men’s health, preserving fertility in hypogonadal men, diagnosis and management of premature ejaculation and understanding the association between erectile dysfunction and cardiovascular disease.

Educational Objectives
By the end of the ASA Symposium, attendees should be able to:
- Explain the controversy and challenges of PSA screening.
- Describe how testosterone affects the prostate and how testosterone replacement may improve urinary flow.
- Describe how to treat hypogonadal men who wish to preserve their fertility.
- Identify the cardiovascular and metabolic risks associated with low testosterone and how low testosterone is associated with an increased risk of mortality.
- Explain the results of the Princeton III guidelines.
- Describe how to diagnose and treat men with premature ejaculation.
- Identify the effects of finasteride on sexual function.
ACCREDITATION INFORMATION

Accreditation Statement
This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the American College of Legal Medicine and the American Society of Andrology. The American College of Legal Medicine is accredited by the ACCME to provide continuing medical education for physicians.

The American College of Legal Medicine designates this live activity for a maximum of 20.25 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Conflict Resolution Statement
The American College of Legal Medicine CME Office has reviewed this activity’s speaker and planner disclosures and resolved all identified conflicts of interest, if applicable.

General Disclaimer
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Special Assistance
We encourage participation by all individuals. If you have a disability, advance notification of any special needs will help us better serve you. Call (847) 517-7225 if you require special assistance to fully participate in the meeting.

MARK YOUR CALENDARS

ASA 39th Annual Conference
April 4 – 8, 2014
InterContinental Buckhead Atlanta
Atlanta, GA

Andrology Lab Workshop
April 5 – 6, 2014

Basic Science Workshop
April 5, 2014

ASA Special Symposium
April 5, 2014

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Andrology, 2013, 1 (Suppl. 2), 18
## XXII North American Testis Workshop

**“The Foundations of Male Fertility”**

April 10 – 13, 2013  
Hyatt Regency San Antonio  
San Antonio, Texas

Chair: William Wright, PhD  
Vice-Chair: Jacquetta Trasler, PhD

*Location: Regency East 1 – 3*

### WEDNESDAY, APRIL 10, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>6:00 p.m.</td>
<td>Registration/Information Desk Open</td>
</tr>
<tr>
<td></td>
<td><em>Location: Los Rios Foyer</em></td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td>Welcome</td>
</tr>
<tr>
<td></td>
<td>William Wright, PhD</td>
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<tr>
<td>7:15 p.m.</td>
<td><strong>Keynote Address</strong></td>
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<tr>
<td>8:15 p.m.</td>
<td><strong>Testis Workshop Welcome Reception</strong></td>
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<tr>
<td></td>
<td><em>Location: Regency West 4 – 6</em></td>
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<tr>
<td>11:15 a.m.</td>
<td><strong>Short Talk – #52</strong></td>
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<tr>
<td></td>
<td>Human Spermatogenic Failure</td>
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<td></td>
<td>Purges Deleterious Mutation Load from the Autosomes and Both Sex Chromosomes, Including</td>
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<td>the Gene DMRT1</td>
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<td>Don Conrad, PhD</td>
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<td></td>
<td>Washington University</td>
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<td>School of Medicine</td>
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### THURSDAY, APRIL 11, 2013

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:00 a.m.</td>
<td>Registration/Information Desk Open</td>
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<tr>
<td></td>
<td><em>Location: Los Rios Foyer</em></td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Continental Breakfast</td>
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<td><em>Location: Regency East Foyer</em></td>
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<tr>
<td>8:00 a.m.</td>
<td><strong>Benchmark Lecture</strong></td>
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<td></td>
<td>Making Waves with Retinoic Acid</td>
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<td></td>
<td>Michael D. Griswold, PhD</td>
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<td></td>
<td>Washington State University</td>
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<tr>
<td>11:30 a.m.</td>
<td>Lunch (on your own)</td>
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### SESSION I: REGULATION AND RESTORATION OF FERTILITY IN MEN

Chair: David Page, MD; Whitehead Institute, MIT

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:45 a.m.</td>
<td><strong>Chair and Introduction to Session I</strong></td>
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<tr>
<td></td>
<td>David Page, MD</td>
</tr>
<tr>
<td></td>
<td>Whitehead Institute, MIT</td>
</tr>
<tr>
<td>8:50 a.m.</td>
<td><strong>Retinoic Acid and Spermatogenesis in Man</strong></td>
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<td></td>
<td>John K. Amory, MD</td>
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<td>University of Washington</td>
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</tbody>
</table>

### SESSION II: GENOME INTEGRITY

Chair: Jacquetta Trasler, PhD; McGill University

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>1:00 p.m.</td>
<td><strong>Introduction to Session II</strong></td>
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<tr>
<td></td>
<td>Jacquetta Trasler, PhD</td>
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<tr>
<td></td>
<td>McGill University</td>
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<tr>
<td>1:05 p.m.</td>
<td><strong>Y Chromosome’s Role in Maintenance of Sperm DNA Integrity</strong></td>
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<td>Monika A. Ward, PhD</td>
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<tr>
<td></td>
<td>Institute for Biogenesis Research</td>
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<td>University of Hawaii, Manoa</td>
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</tbody>
</table>

### SCHEDULE OF EVENTS

© 2013 American Society of Andrology and European Academy of Andrology  
Andrology, 2013, 1 (Suppl. 2), 19
SCHEDULE OF EVENTS

2:40 p.m. – 3:15 p.m. Genetic and Genomic Approaches to Understand Testicular Cancer
James Amatruda, MD, PhD
UT Southwestern Medical Center

3:15 p.m. – 3:50 p.m. Controlling the Number and Distribution of Recombination Events in Mouse Meiosis
Scott Keeney, PhD
Memorial Sloan-Kettering Cancer Center

3:50 p.m. – 5:50 p.m. Poster Session I
Location: Regency West 4 – 6

5:50 p.m. Buses leave for Social Event
Location: Hotel Lobby

7:00 p.m. Testis Workshop Social Event
Location: Tejas Steakhouse & Rodeo
(not included in registration fee; tickets required)

FRIDAY, APRIL 12, 2013

7:00 a.m. – 6:00 p.m. Registration/Information Desk Open
Location: Los Rios Foyer

7:00 a.m. – 8:00 a.m. Continental Breakfast
Location: Regency East Foyer

8:00 a.m. – 8:45 a.m. EMBO Young Investigator Lecture
Towards Understanding the Molecular Logic of Paternal Epigenetic Inheritance
Antoine Peters, PhD
Friedrich Miescher Institute for Biomedical Research, Switzerland

8:45 a.m. – 8:50 a.m. Introduction to Session III
Leslie Heckert, PhD
University of Kansas Medical Center

8:50 a.m. – 9:25 a.m. TAF4b Regulates the Balance Between Spermatogonial Stem Cell Renewal and Differation
Richard Freiman, PhD
Brown University

9:25 a.m. – 10:00 a.m. Generations at Risk: The Role of the Sperm Epigenome in Development and Disease
Sarah Kimmins, PhD
McGill University

10:00 a.m. – 10:25 a.m. Break
Location: Regency East Foyer

10:25 a.m. – 11:00 a.m. Regulation of Proliferation and Differation in the Spermatogonial Stem Cell Lineage
Margaret T. Fuller, PhD
Stanford University School of Medicine

11:00 a.m. – 11:15 a.m. Short Talk – #91
Sperm Histones Influence Early Embryonic Gene Expression
Ralph G. Meyer, PhD
University of Pennsylvania

11:15 a.m. – 11:30 a.m. Short Talk – #75
Stage-Specific Expression and Subcellular Localization of Long Interspersed Element Type 1 (LINE-1) Protein During Male Germ Cell Development (Abstract #75)
Wenfeng An, PhD
Washington State University

11:30 a.m. – 1:00 p.m. Lunch (on your own)

SESSION IV: SOMATIC CELLS
Chair: Kate Loveland, PhD; Monash University, Australia

1:00 p.m. – 1:05 p.m. Chair and Introduction to Session IV
Kate Loveland, PhD
Monash University, Australia

1:05 p.m. – 1:40 p.m. Find Me, Eat Me and I’m Full: The Clearance of Apoptotic Germ Cells
Jeffrey J. Lysiak, PhD
University of Virginia

1:40 p.m. – 2:15 p.m. Germ Cell Migration Across Sertoli Cell Tight Junctions
Robert Braun, PhD
The Jackson Laboratories

2:15 p.m. – 2:30 p.m. Short Talk – #40
Sertoli Cells Survive Xenotransplantation by Modulating the Macrophages at the Graft Site to be Regulatory versus Cytotoxic
Payal Mital
Texas Tech University
Health Sciences Center

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Andrology, 2013, 1 (Suppl. 2), 20
SCHEDULE OF EVENTS

2:30 p.m. – 2:55 p.m. Break
2:55 p.m. – 3:30 p.m. The MEK/ERK Cascade Regulates the Expression of All Genes Involved in Testosterone Synthesis in Leydig Cells
Mario Ascoli, PhD
The University of Iowa

3:30 p.m. – 4:05 p.m. Regulatory T Cell Controls Spontaneous and Post-Vasectomy Autoimmune Orchitis
Kenneth S. K. Tung, MD
University of Virginia, Dept of Pathology

4:05 p.m. – 4:20 p.m. Short Talk – #44
MicroRNAs: Novel Androgen Responsive Transacting Factors in the Testis
Subbarayalu Panneerdos, PhD
University of Texas Health Science Center at San Antonio

4:20 p.m. – 4:35 p.m. Short Talk – #71
Genome Wide Mapping of DNA Breaks During Spermiogenesis
Marie-Chantal Gregoire, MSc
Université de Sherbrooke, Canada

4:35 p.m. – 6:35 p.m. Poster Session II
Location: Regency West 4 – 6

SATURDAY, APRIL 13, 2013

7:00 a.m. – 12:00 p.m. Registration/Information Desk Open
Location: Los Rios Foyer

7:00 a.m. – 8:00 a.m. Continental Breakfast
Location: Regency East Foyer

SESSION V: STEM CELLS AND THEIR NICHE
Chair: William Wright, PhD; Johns Hopkins University

8:00 a.m. – 8:05 a.m. Introduction to Session V
William Wright, PhD
Johns Hopkins University

8:05 a.m. – 8:40 a.m. Population Dynamics of the Mouse Spermatogenic Stem Cells
Soshei Yoshida, MD, PhD
National Institute of Basic Biology, Japan

8:40 a.m. – 9:15 a.m. Molecular Regulation of Fate Determination in Male Germline Stem Cells
Jon Oatley, PhD
Washington State University

9:15 a.m. – 9:50 a.m. Stem Cell Renewal in the Drosophila Testis
Ericka Matunis, PhD
Johns Hopkins University School of Medicine

9:50 a.m. – 10:05 a.m. Short Talk – #60
Partial Overlap of SALL4 and PLZF Binding Sites in Spermatogonial Stem Cells Reveals Putative Shared and Distinct Functional Roles
Dawn Lovelace, BS, MS
University of Texas at San Antonio

10:05 a.m. – 10:30 a.m. Break
Location: Regency East Foyer

10:30 a.m. – 11:05 a.m. Translating Spermatogonial Stem Cell Transplantation Toward the Clinic
Kyle Orwig, PhD
University of Pittsburgh

11:05 a.m. – 11:20 a.m. Short Talk – #84
Zinc Finger and TAL-Effectort Nuclease Mediated Gene Targeting in Mouse Spermatogonial Stem Cells
Christina Dann, PhD
Indiana University

11:20 a.m. – 11:35 a.m. Short Talk – #104
Aging is Associated with Altered Gene Expression and a Reduced Number and Quality of Spermatogonial Stem Cells
Catriona Paul, PhD
McGill University

11:35 a.m. – 11:45 a.m. Concluding Remarks & Acknowledgements

11:45 a.m. – 12:00 p.m. Announcement of the 23rd North American Testis Workshop
Adjourn
### SCHEDULE OF EVENTS

**Andrology Lab Workshop**  
*“Semen Analysis Quality Control”*  
April 13 – 14, 2013  
Hyatt Regency San Antonio  
San Antonio, Texas  

Program Chairs: Steven M. Schrader, PhD and Susan A. Rothmann, PhD, HCLD  

*Location: Live Oak*

<table>
<thead>
<tr>
<th>SATURDAY, APRIL 13, 2013</th>
<th>SUNDAY, APRIL 14, 2013</th>
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<tbody>
<tr>
<td><strong>7:00 a.m. – 7:00 p.m.</strong></td>
<td><strong>1:30 p.m. – 2:45 p.m.</strong></td>
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<tr>
<td>Registration/Information Desk Open</td>
<td>Exercise IV – Variation in Sperm Motility</td>
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<tr>
<td><em>Location: Los Rios Foyer</em></td>
<td>2:45 p.m. – 3:15</td>
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<tr>
<td>8:00 a.m. – 8:30 a.m.</td>
<td>Break</td>
</tr>
<tr>
<td>Continental Breakfast</td>
<td>3:15 p.m. – 4:30 p.m.</td>
</tr>
<tr>
<td><em>Location: Live Oak</em></td>
<td>Root Cause Analysis: Morphology as a Case Study</td>
</tr>
</tbody>
</table>
| 8:30 a.m. – 9:00 a.m. | Susan A. Rothmann, PhD, HCLD  
Fertility Solutions, Inc. |
| Introduction to the Workshop | 9:00 a.m. – 10:00 a.m. |
| Steve Schrader, PhD, NIOSH | Exercise V – Sperm Morphology  
LJ Chart Analysis and Root Cause Analysis |
| 9:00 a.m. – 10:00 a.m. | 8:00 a.m. – 8:30 a.m. |
| QC for Semen Analysis: Why, What, When | Continental Breakfast  
*Location: TBD* |
| Susan A. Rothmann, PhD, HCLD  
Fertility Solutions, Inc. | 8:30 a.m. – 9:00 a.m. |
| Exercise II – Construct Levey-Jennings (LJ) Control Charts | I’m in Range, What Do You Mean I’m Not in Control?  
Interpretation of LJ Charts  
Anna Bort  
Fertility Solutions, Inc. |
| 10:00 a.m. – 10:30 a.m. | 9:00 a.m. – 10:00 a.m. |
| Break | Exercise V – Sperm Morphology  
LJ Chart Analysis and Root Cause Analysis |
| 10:30 a.m. – 11:00 a.m. | 10:00 a.m. – 10:30 a.m. |
| QC for Semen Analysis: WHO The Problem with the WHO Manual Approach | Distinguished Andrologist Award /Break |
| 10:30 a.m. – 11:00 a.m. | 10:30 a.m. – 11:00 a.m. |
| Declining Sperm Counts or Changing Methods? The Role of QC in Semen Analysis Predictive Value and Publications Quality Faculty Panel |
| 11:00 a.m. – 11:45 a.m. | 11:00 a.m. – 12:00 p.m. |
| Exercise III – Why Counting Error (Sampling Error) is Not Quality Control | Summary, Closing Remarks & Discussion |
| 11:45 a.m. – 1:15 p.m. |  |
| Lab Science Forum Lunch  
Male Reproductive Anatomy and Spermatogenesis: A Primer at the Speed of Light  
Rex A. Hess, MS, PhD  
University of Illinois |  |

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Andrology, 2013, 1 (Suppl. 2), 22
SCHEDULE OF EVENTS

ASA Special Symposium
“Innovations in Men’s Health”
Saturday, April 13, 2013
Hyatt Regency San Antonio
San Antonio, Texas

Program Chairs: Mohit Khera, MD and
Allen D. Seftel, MD, FACS

Location: Regency East 1 – 3

SATURDAY, APRIL 13, 2013

Prostate Cancer and BPH
Moderator: Wayne J.G. Hellstrom, MD

1:00 p.m. – 1:20 p.m. PSA Screening
Ian M. Thompson, Jr., MD

1:20 p.m. – 1:40 p.m. BPH and Effects of TRT
Culley C. Carson, III, MD

1:40 p.m. – 1:50 p.m. Questions and Answers

Testosterone Replacement Therapy
Moderator: Mohit Khera, MD

1:50 p.m. – 2:10 p.m. Preserving Fertility in the Hypogonadal Male
Edward D. Kim, MD

2:10 p.m. – 2:30 p.m. TRT and Mortality
Alvin M. Matsumoto, MD

2:30 p.m. – 2:40 p.m. Questions and Answers

2:40 p.m. – 2:50 p.m. Break
Location: Regency East Foyer

Cardiovascular Disease and Metabolic Syndrome
Moderator: Andre T. Guay, MD

2:50 p.m. – 3:10 p.m. Princeton III Update
Ajay Nehra, MD

3:10 p.m. – 3:30 p.m. Diagnosis and Treatment of Metabolic Syndrome
Martin Miner, MD

3:30 p.m. – 3:40 p.m. Questions and Answers

Sexual Function
Moderator: Alvin M. Matsumoto, MD

3:40 p.m. – 4:00 p.m. Update on Premature Ejaculation
Wayne J.G. Hellstrom, MD

4:00 p.m. – 4:20 p.m. Finasteride’s Effect on Sexual Function
Abdulmaged M. Traish, PhD

4:20 p.m. – 4:30 p.m. Questions and Answers

Low Testosterone Is a Marker for Poor Health
Moderator: Mohit Khera, MD

4:30 p.m. – 5:00 p.m. Is Low Testosterone Just a Marker of Poor Health? Or Does It Have a More Direct Effect on CV Risk?
Andre T. Guay, MD

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Andrology, 2013, 1 (Suppl. 2), 23
**Mini-Symposium**

“**Andrology in Uniform**”

Tuesday, April 16, 2013

*Immediately after the close of the 2013 ASA*

Hyatt Regency San Antonio
San Antonio, Texas

Program Chair: Donna L. Vogel, MD, PhD

*Location: Live Oak*

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**ASA 38th Annual Meeting**

“**Andrology at the Heart of Health and Disease**”

April 13 – 16, 2013

Hyatt Regency San Antonio
San Antonio, Texas

Program Chairs: John K. Amory, MD and Vassilios Papadopoulos, PhD

*Location: Regency East 1 – 3*

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**TUESDAY, APRIL 16, 2013**

1:00 p.m. – 1:05 p.m.  
**Introduction**  
Donna L. Vogel, MD, PhD

---

**Endocrine-Metabolic Dysfunction in Veterans**

Chair: Donna L. Vogel, MD, PhD

1:05 p.m. – 1:30 p.m.  
**Hormonal Abnormalities Related to TBI, PTSD and Spinal Cord Injury – An Overview**  
Marc R. Blackman, MD

1:30 p.m. – 1:55 p.m.  
**Endocrine Abnormalities During Combat and Training**  
Shalender Bhasin, MD

1:55 p.m. – 2:20 p.m.  
**Consequences of Hypogonadism after Traumatic Brain Injury: Will Intervention During Rehabilitation Make a Difference?**  
Margaret E. Wierman, MD

2:20 p.m. – 2:30 p.m.  
**Break**

---

**Fertility, Sexual Function and Genitourinary Injury**

Chair: Ajay K. Nangia, MBBS

2:30 p.m. – 2:55 p.m.  
**Infertility and Fertility Preservation**  
Ajay K. Nangia, MBBS

2:55 p.m. – 3:20 p.m.  
**Genitourinary Issues in Dismounted Complex Blast Injury**  
Steve W. Waxman, MD, JD, FCLM

3:20 p.m. – 3:45 p.m.  
**Genitourinary war trauma perspectives from the Combat Support Hospital and from Capitol Hill**  
Mark T. Edney, MD

3:45 p.m. – 4:00 p.m.  
**Discussion**

---

FRIDAY, APRIL 12, 2013

7:00 a.m. – 6:00 p.m.  
**Registration**  
Location: Los Rios Foyer

---

SATURDAY, APRIL 13, 2013

7:00 a.m. – 8:00 a.m.  
**Breakfast**  
Location: Regency East Foyer

7:00 a.m. – 7:00 p.m.  
**Registration**  
Location: Los Rios Foyer

4:00 p.m. – 9:30 p.m.  
**Exhibit Hall Open**  
Location: Rio Grande Ballroom

6:00 p.m. – 6:10 p.m.  
**Welcome and Opening Remarks**

6:10 p.m. – 6:30 p.m.  
**Updates from NICHD & NIEHS**  
Stuart B. Moss, PhD  
NICHD

Thaddeus T. Schug, PhD  
NIEHS

6:30 p.m. – 6:50 p.m.  
**Distinguished Andrologist Award**

6:50 p.m. – 7:50 p.m.  
**EMIL STEINBERGER MEMORIAL LECTURE**  
Male Fertility: Systems Genetics and Drug Discovery  
Deborah A. O’Brien, PhD  
University of North Carolina at Chapel Hill  
(Introduced by Donna L. Vogel, MD, PhD)

7:50 p.m. – 9:30 p.m.  
**Welcome Reception**  
Location: Rio Grande Ballroom

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Andrology, 2013, 1 (Suppl. 2), 24
SUNDAY, APRIL 14, 2013

6:30 a.m. – 8:00 a.m. Past President’s Breakfast
Location: Medina

7:00 a.m. – 8:00 a.m. Breakfast
Location: Rio Grande Ballroom

7:00 a.m. – 4:00 p.m. Exhibit Hall Open
Location: Rio Grande Ballroom

7:00 a.m. – 6:00 p.m. Registration
Location: Los Rios Foyer

8:00 a.m. – 9:00 a.m. AUA LECTURE
A Non-Invasive Progenitor Cell Therapy on the Erectile Dysfunction of Diabetic Rats
Tom F. Lue, MD
University of California-San Francisco
(Introduced by Ajay K. Nangia, MBBS)

9:00 a.m. – 9:15 a.m. Distinguished Service Award

9:15 a.m. – 10:45 a.m. SYMPOSIUM I – Hypogonadism and Metabolism
Co-chairs: George L. Gerton, PhD
Christina Wang, MD

Hypogonadism and Metabolic Syndrome
Adrian S. Dobs, MD, MHS
Johns Hopkins University

Hypogonadism and Advanced Cancer
Antonio Vigano, MD
McGill University

The Natural History of Late Onset Hypogonadism – Implications for Clinical Management
Frederick C.W. Wu, MD
Manchester Royal Infirmary

10:45 a.m. – 11:00 a.m. Break
Location: Rio Grande Ballroom

11:00 a.m. – 12:30 p.m. Poster Session I
Location: Regency West 4 – 6

12:30 p.m. – 2:00 p.m. MENTORING LUNCHEON
SPONSORED BY THE DIVERSITY AND TRAINEE AFFAIRS COMMITTEES
Location: Pecan
“‘Diversity’ in Andrology: Why/How/What/Who?”
George L. Gerton, PhD
Co-Chair of Trainee Affairs and Diversity Committees
(not included in registration; tickets required)

12:30 p.m. – 2:00 p.m. Editorial Board Luncheon
Location: Medina

2:00 p.m. – 3:30 p.m. Oral Sessions I: New Insights in Clinical Andrology
Location: Regency East 1 – 3
Moderators: Leslie Lynn Heckert, PhD
Kansas City, KS
Elizabeth Snyder, PhD
Bar Harbor, ME

2:00 p.m. – Abstract #1
THE EFFECT OF CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) ON THE HYPOTHALAMO-PITUITARY-GONADAL AXIS IS MODIFIED BY AGE IN MEN WITH OBSTRUCTIVE SLEEP APNEA (OSA): A RANDOMISED SHAM-CONTROLLED 12 WEEK STUDY
Camilla Hoyos, BAppSc (Hons), MPH, PhD¹, Daniel Keenan², Johannes Veldhuis³ and Peter Liu, MBBS (Hons), PhD⁴
¹NHMRC Centre for Integrated Research and Understanding of Sleep (CIRUS), Woolcock Institute of Medical Research, and University of Sydney; ²Department of Statistics, University of Virginia; ³Department of Medicine, Endocrine Research Unit, Mayo School of Graduate Medical Education, Clinical Translational Science Centre, Mayo Clinic; ⁴Division of Endocrinology, Department of Medicine, David Geffen School of Medicine at UCLA, Harbor-UCLA Medical Centre and Los Angeles Biomedical Research Institute
(Presented By: Peter Liu, MBBS (Hons), PhD)

2:15 p.m. – Abstract #2
ASSOCIATION BETWEEN ENDOGENOUS TESTOSTERONE (T), PROSTATE SYMPTOMS, AND PROSTATE-SPECIFIC ANTIGEN (PSA) LEVELS IN HYPOGONADAL MEN
Andre Araujo, PhD¹, Teresa Curto, MSW, MPH¹, Frans Debruyne, MD, PhD², Adrian Dobs, MD, MHS², Clauss Roehrborn, MD², Fritz Schroder, MD³, Frederick Wu, MB, ChB, MD, FRCP⁴ and Raymond Rosen, PhD¹
¹New England Research Institutes, Inc.; ²Andros Men’s Health Institutes; ³Jons Hopkins University; ⁴UT Southwestern Medical Center; ⁵Erasmus Medical Center; ⁶Central Manchester University Hospitals NHS Foundation Trust
(Presented By: Andre Araujo, PhD)
2:30 p.m. – Abstract #3
PROTEOMIC PROFILING OF THE SPERM HEADS FROM INFERTILE MEN REVEALS DECREASED EXPRESSION OF FIVE MEMBERS OF THE CHAPERONIN CONTAINING TCP-1 COMPLEX
Elsa Kichine, PhD¹, Barbara Hales, PhD⁰, Bernard Robaire, PhD¹ and Chan Peter, MD²
¹McGill University; ²McGill University Health Centre
(Presented By: Elsa Kichine, PhD)

2:45 p.m. – Abstract #4
A PATERNAL INFLUENCE ON THE EMBRYONIC CAPACITY FOR IMPLANTATION OBSERVED IN A SURROGATE MOTHERHOOD PROGRAM
Ioannis Giakoumakis, MD, Diamantis Daphnis, MD, PhD, Pavlos Sidonis, Resident, Evlalia Vlachopoulou, Biologist, Dimitrios Baltogiannis, Assistant Professor, MD, PhD and Nikolaos Sofikitis, Professor of Urology, MD, PhD
Mediterranean Fertility Center & Genetic Services
(Presented By: Ioannis Giakoumakis, MD)

3:00 p.m. – Abstract #5
SPERM SUPPRESSION AND CONTRACEPTIVE PROTECTION PROVIDED BY NORDESTHISTERONE ENANTATE (NET-EN) COMBINED WITH TESTOSTERONE UNDECANOATE (TU) IN HEALTHY MEN
Doug Colvard, PhD
CONRAD, Eastern Virginia Medical School
(Presented By: Doug Colvard, PhD)

3:15 p.m. – Abstract #6
COMPARISON OF INFRAPUBIC VERSUS TRANSCROTAL APPROACHES FOR INFLATABLE PENILE PROSTHESIS PLACEMENT: A MULTI-INSTITUTION REPORT
Landon Trost, MD¹, Aaron Boonjindaisup, MD², Ahmet Gokce, MD² and Wayne Hellstrom, MD, FACS²
¹Mayo Clinic; ²Tulane University School of Medicine, New Orleans, LA
(Presented By: Landon Trost, MD)

3:30 p.m. – 4:45 p.m.
LECTURE I
Gail A. Cornwall, PhD
Texas Tech University
(Introduced by Barry T. Hinton, PhD)

2:15 p.m. – Abstract #8
E2F1: A MULTI REGULATOR OF TESTICULAR DESCENT AND FERTILITY
Carolina Jorgez, PhD¹, Venkata Vangapandi, MS¹, Aysegul Sahin, BS¹, Jill Rosenfeld, MS², Larry Lipshultz, MD and Dolores Lamb, PhD¹
¹Baylor College of Medicine; ²Signature Genomics
(Presented By: Carolina Jorgez, PhD)

2:30 p.m. – Abstract #9
GENOMIC DISORDERS ASSOCIATED WITH GENITAL ANOMALIES AND MIDLINE FUSION DEFECTS
Shaye Lewis, PhD¹, Josephine Addai, BS¹, Aysegul Sahin, BS¹, Patience Wildenfels, MD¹, Jill Rosenfeld, PhD² and Dolores Lamb, PhD¹
¹Baylor College of Medicine; ²Signature Genomics Laboratories Perkin Elmer
(Presented By: Shaye Lewis PhD)

2:45 p.m. – Abstract #10
WNT SIGNALLING IN THE ADULT HUMAN TESTIS
Genevieve Kerr, Helen Abud¹, Julia Young¹, Katja Horvay¹, Ewa Rajpert-De Meyts² and Kate Loveland¹
¹Monash University; ²Rigshospitalet
(Presented By: Genevieve Kerr)

3:00 p.m. – Abstract #11
ROLE OF WSX-1 IN THE CYTOPROTECTIVE ACTION OF THE MITOCHONDRIAL PEPTIDE, HUMANIN, ON MALE GERM CELLS
Yue Jia, MD, PhD¹, Yan-He Lue, MD¹, Prasanth Surampudi, MD¹, Peter Liu, MD, PhD¹, Ronald S. Swerdloff, MD¹, Kuk-Wha Lee, MD, MD, PhD², Pinchas Cohen, MD and Christina Wang, MD¹
¹Los Angeles Biomedical Research Institute and Harbor-UCLA Medical Center; ²Mattel Children’s Hospital, David Geffen School of Medicine at UCLA; ³David Geffen School of Medicine at UCLA & USC Davis School of Gerontology, Ethel Percy Andrus Gerontology Center
(Presented By: Yue Jia, MD, PhD)

3:15 p.m. – Abstract #12
INSULIN AS AN IMPORTANT PROSURVIVAL FACTOR FOR HUMAN SPERMATOZOA
R. John Aitken, PhD, ScD¹, Saeed Shokri, PhD², Dwi A. Pujianto PhD³, Benjamin J. Curry, PhD⁴, Sarah J Whiting, PhD⁴ and Lois Salamonsen, PhD⁵
¹University of Newcastle, NSW; ²Zanjan University of Medical Sciences, Iran; ³University of Indonesia, Indonesia; ⁴University of Newcastle, Australia; ⁵Prince Henry’s Research Institute, Australia
(Presented By: R. John Aitken, PhD, ScD)
SCHEDULE OF EVENTS

LECTURE II
4:45 p.m. – 5:30 p.m. Human Gamete Recognition in Transgenic Mice
Jurrien Dean, MD
NIDDK, NIH
(Introduced by Vassilios Papadopoulos, PhD)

6:00 p.m. – 8:00 p.m. Trainee Forum and Mixer
(All Trainee Travel Awards will be distributed and celebrated at this event)
Location: Garden Terrace

MONDAY, APRIL 15, 2013
7:00 a.m. – 8:00 a.m. Breakfast
Location: Rio Grande Ballroom
7:00 a.m. – 3:30 p.m. Exhibit Hall Open
Location: Rio Grande Ballroom
7:00 a.m. – 6:00 p.m. Registration
Location: Los Rios Foyer

8:00 a.m. – 9:00 a.m. WOMEN IN ANDROLOGY LECTURE
DNA Methylation in the Germline During Development
Jacquetta M. Trasler, MD, PhD
McGill University
(Introduced by Dolores J. Lamb, PhD)

9:00 a.m. – 9:15 a.m. Young Andrologist Award

9:15 a.m. – 10:45 a.m. SYMPOSIUM II – Testosterone Target Tissues in the Body
Co-chairs: Patricia L. Morris, PhD
J. Lisa Tenover, MD, PhD
Interaction Between Androgen and RUNX Signaling in Bone and Prostate Cancer
Baruch Frenkel, DMD, PhD
University of Southern California
Castrate-Resistant, But Testosterone Sensitive, Cells in Primary Prostate Tumors are Stem Cell-Like and Cancer Repopulating
Gail Risbridger, PhD
Monash University

10:45 a.m. – 11:00 a.m. Break
Location: Rio Grande Ballroom

11:00 a.m. – 12:30 p.m. Poster Session II
Location: Regency West 4 – 6

12:30 p.m. – 2:00 p.m. WOMEN IN ANDROLOGY LUNCHEON AND DISCUSSION
Location: Live Oak
When the Going Gets Tough … Moving Past Burnout
Moderator: Elizabeth Snyder, PhD
Panelists: Dolores J. Lamb, PhD
Sophie La Salle, PhD
Elizabeth Snyder, PhD
(Not included in registration fee; tickets required)

2:00 p.m. – 3:30 p.m. SYMPOSIUM III – Hormones and Drugs Regulating Testis Function
Co-chairs: Keith A. Jarvi, MD
Kate Loveland, PhD
Diverse Role of Prolactin in Male Sexual Behavior and Reproduction
Darius A. Paduch, MD, PhD
Cornell University
Endocrine Regulation of Male Fertility by the Skeleton
Gerard Karsenty, MD, PhD
Columbia University
Tyrosine Kinase Inhibitors and the Testis
Lucio Gnessi, MD, PhD
Sapienza University

3:30 p.m. – 4:00 p.m. Refreshment Break
Location: Rio Grande Ballroom

4:00 p.m. – 4:45 p.m. LECTURE III:
Androgen in Health and Disease
Shalender Bhasin, MD
Boston University
(Introduced by Robert E. Brannigan, MD)
SCHEDULE OF EVENTS

4:45 p.m. – 5:30 p.m. | EAA LECTURE:  
Development and Biology of  
Human Germ Cells: Lessons  
from Testicular Neoplasms  
Ewa Rajpert-De Meyts, MD, PhD  
Copenhagen University  
(Introduced by Douglas T. Carrell, PhD)

9:30 a.m. – 9:45 a.m. | Break  
Location: Regency East Foyer

5:30 p.m. | ASA Business Meeting,  
Outstanding Trainee Investigator  
and Trainee Awards

6:30 p.m. | Buses Depart from Hotel Lobby

7:00 p.m. – 11:00 p.m. | Annual Banquet  
(Not included in registration fee;  
tickets required)  
Location: The Buckhorn Saloon  
and Museum

7:00 a.m. – 8:00 a.m. | 2014 Program Committee Meeting  
Location: Chula Vista Boardroom

7:00 a.m. – 8:00 a.m. | Breakfast  
Location: Regency East Foyer

7:30 a.m. – 12:15 p.m. | Registration  
Location: Los Rios Foyer

8:00 a.m. – 9:30 a.m. | SYMPOSIUM IV – Infection and Immunity  
Co-chairs: Kirk C. Lo, MD, FRCSC  
Pablo E. Visconti, PhD  
HPV Vaccine in Males  
Anna R. Giuliano, PhD  
Moffitt Cancer Center  
Sexually Transmitted Infections and Infertility  
Deborah J. Anderson, PhD  
Harvard University

10:45 a.m. – 12:15 p.m. | SYMPOSIUM V – Environment, Metabolism and Fertility  
Co-chairs: Peter Chan, MD  
John H. Richburg, PhD  
Environment and Male Reproductive Health: Epidemiologic Evidence and its Interpretation  
Russ Hauser, PhD  
Harvard University  
Environment and Sperm Aneuploidy  
Melissa Perry, ScD, MHS  
George Washington University  
Rethinking the Anti-Oxidant System in Spermatozoa  
Cristian O’Flaherty, PhD  
McGill University

MEETING ADJOURNED

Disclaimer Statement  
Statements, opinions and results of studies contained in the program are those of the presenters/authors and do not reflect the policy or position of the ASA nor does the ASA provide any warranty as to their accuracy or reliability.
Low-energy shockwave therapy

Introduction and Objectives:
Low-energy shockwave therapy (LESWT) has been shown to improve erectile function in patients suffering from diabetes mellitus (DM)-associated erectile dysfunction (ED). However, the underlying mechanism for this therapeutic effect is unknown. The objective is to investigate whether LESWT can ameliorate DM-associated ED in a rat model, and examine the associated changes in the erectile tissues.

Materials and Methods:
Newborn male rats were intraperitoneally injected with 5-ethyl-2-deoxyuridine (EdU, 50mg/kg) for the purpose of tracking endogenous progenitor cells. Eight weeks later, 8 of these rats were randomly chosen to serve as normal control (N group). The remaining rats were injected intraperitoneally with 60 mg/kg of streptozocin (STZ) to induce the development of DM. Eight of these rats were randomly chosen to serve as DM control (DM group) while another 8 rats were subject to shockwave treatment (DM+SW group). Each rat in the DM+SE group received 300 shocks at energy level of 0.1mJ/mm² and frequency of 120/min. This procedure was repeated three times a week for two weeks. Another two weeks later, all 24 rats were evaluated for erectile function by intracavernous pressure (ICP) as response to electrostimulation of cavernous nerves. Afterward, their penile tissues were examined by histology, followed by image and statistical analyses.

Main Outcome Measures:
Erectile function was assessed by ICP. Neuronal nitric oxide synthase (nNOS)-positive nerves and the endothelium were examined by immunofluorescence (IF) staining. Smooth muscle and progenitor cells were examined by phalloidin and EdU staining, respectively. The histological images were then quantitatively analyzed with image analysis programs.

Results:
STZ treatment caused a significant decrease in erectile function and in the number of nNOS-positive nerves and in endothelial and smooth muscle contents. These DM-associated deficits were all partially but significantly reversed by LESWT. Progenitor cells (EdU⁺ cells) were significantly more numerous in DM+SW than in DM rats.

Conclusion:
LESWT can partially ameliorate DM-associated ED by promoting regeneration of nNOS-positive nerves, endothelium, and smooth muscle in the penis. These beneficial effects appear to be mediated by recruitment of endogenous progenitor cells.

Funding: Partial support received from NIDDK.

SYMPOSIUM I – Hypogonadism and Metabolism
HYPOGONADISM AND METABOLIC SYNDROME
Adrian Dobs, MD, MHS, Professor of Medicine and Oncology, The Johns Hopkins University School of Medicine

Male hypogonadism is associated with multiple metabolic disturbances, including insulin resistance, glucose intolerance and hyperlipidemia. The mechanisms that contribute to these clinical observations are unclear, but may be mediated through visceral adiposity, abdominal obesity and a pro-inflammatory state. In addition, there may be a direct effect of testosterone on insulin action that may explain several of the acute effects. Interestingly, hypogonadism may be a cause, as well as a result of these physiologic changes. Treatment should first address lifestyle modification and weight loss. Testosterone replacement therapy may have an additional role to modify body composition and improve metabolic abnormalities.
SYMPOSIUM I – Hypogonadism and Metabolism

HYPOGONADISM AND ADVANCED CANCER
Antonio Vigano MD, MSc.
McGill Nutrition and Performance Laboratory, McGill University Health Centre, Montreal, QC, Canada

Background: Male hypogonadism is commonly diagnosed on the basis of subphysiological concentrations of androgen hormones, and it has been associated with a variety of symptoms (i.e. fatigue, depression, sleep disturbances, and reduced sexual desire) and signs (i.e. decreased muscle strength, physical performance and bone mass). Androgen deficiency might be an important contributory cause of similar and frequent clinical features of advanced cancer.

Objective: To review systematically the literature on the clinical association of male hypogonadism in advanced cancer.

Methods: We searched PubMed, Medline, and Embase for publications on the relation between male hypogonadism and functional status, nutritional status, body composition, symptoms, and quality of life in patients with advanced cancer.

Results: Of 382 publications identified, seven original articles were included. Only physical endurance was found definitely associated with severe androgen deficiency. Possible associations between male hypogonadism and weight loss, low albumin, low-body cell mass index, low-peripheral fat and muscle mass, higher inflammation, higher pain, higher opioid consumption, worse scores for anxiety, depression, and emotional and functional well-being, could not be confirmed through well designed studies.

Conclusions: There is paucity of epidemiological data on the clinical association of male hypogonadism with nutritional and functional problems in advanced cancer patients. A clearer epidemiology of cancer-related deficiency of androgen as well as prospective clinical trials are needed to determine if testosterone replacement therapy can effectively improve the quality of life in advanced cancer patients.

SYMPOSIUM I – Hypogonadism and Metabolism

THE NATURAL HISTORY OF LATE ONSET HYPOGONADISM – IMPLICATIONS FOR CLINICAL MANAGEMENT
F.C.W. Wu, MD
University of Manchester, United Kingdom

Serum testosterone (T) levels gradually decline with age in men. However, the clinical significance of this remains unclear. The concept of ‘late-onset hypogonadism’ (LOH), as a geriatric syndrome, defined by clinical and biochemical criteria, remains controversial. To improve the specificity of the syndrome, we have recently proposed the minimum criteria for LOH which entailed the presence of three sexual symptoms (decreased sexual interest and morning erections, and erectile dysfunction) in combination with total T below 11 nmol/L and free T below 220 pmol/L. Using these criteria, we have reported associations between LOH and a variety of end organ deficits suggestive of androgen deficiency. However, the clinical significance and the natural history of LOH remain largely undefined.

This lecture will present new longitudinal data from the European Male Ageing Study (EMAS) on the natural history of LOH with respect to: predictors of changes in testosterone, all-cause and cardiovascular mortality, the changes in phenotypic and biochemical features and predictors of incident and persistent cases of this syndrome. The overlapping contribution of low testosterone and sexual symptoms will be discussed. These results suggest that LOH is a manifestation of obesity, insulin resistance and poor general/cardiovascular health associated with reversible functional hypothalamic hypogonadism. Clinical management should be expectant with interim rather than permanent hormone replacement to improve symptoms and maintain androgen-dependent functions appropriate to age and individual.

In addition to symptomatic management with testosterone replacement in men with persistently low T, it is important to consider cardiovascular and other disease risk assessments, as well as weight management in the obese. LOH identifies an important window of opportunity for preventative management in a defined group of men with poor cardiometabolic health and a greatly increased risk of dying.

LECTURE I

FUNCTIONAL AMYLOID IN THE REPRODUCTIVE TRACT
Sandra Whelly, Benoit Guyonnet, Trupti Kale, Amy Nilles, Mary Catherine Hastert1, and Gail A. Cornwall
Texas Tech University Health Sciences Center and 1 Texas Tech University Imaging Center, Lubbock, TX

Objectives: Amyloids are aggregated proteins characterized by a higher ordered cross β-sheet fibrillar structure and are typically associated with neurodegenerative diseases including Alzheimer’s, Huntington’s and Lou Gehrig’s disease. Within the past few years, work from my lab as well as that from others has contributed to a paradigm shift in the field of protein aggregation. Specifically, these studies have demonstrated that not all protein aggregates/amyloids cause disease but rather in some organs including the skin and those in the reproductive tract amyloid structures are part of normal cellular processes and carry out biological functions. In particular, within the epididymis we have shown that the cystatin CRES contributes to the formation of an amyloid structure that surrounds the maturing spermatozoa in the absence of any pathology. The goals of our studies were to: 1) examine the mechanism of how functional amyloids are formed in the epididymis in the absence of pathology, 2) the consequences of abnormal epididymal amyloid on sperm function; and 3) determine the presence of amyloid within the sperm acrosome.

Methods: Classic approaches to study amyloid were used including immunofluorescence and dot blot analysis using conformation-dependent antibodies and fluorogenic reagents such as Thioflavin S and Congo Red which bind to the cross-β-sheet structure present in amyloid. Negative stain electron microscopy and X-ray diffraction were also carried out to examine amyloid structures.

Results: In addition to CRES three other CRES subgroup family members, CRES2, CRES3, and cystatin E2, form amyloid in vitro and in vivo within the epididymal lumen yet exhibit unique aggregation properties suggesting these proteins, along with CRES, may have integrated functions. In support, CRES gene knockout mice exhibit reduced levels of CRES2, CRES3 and cystatin E2. Further, localization studies show that CRES and the CRES subgroup members are all present within a film-like amyloid structure that is present within the luminal environment. Studies are currently ongoing to determine whether one subgroup protein may control the aggregation properties of the others, allowing these proteins to dictate when and where amyloid forms. Using a cell culture model we have also determined that a proportion of CRES localizes to the epididymal cell nuclei suggesting an additional level of regulation. To determine the consequences of abnormal epididymal amyloid on sperm function, we study the L68Q mouse model overexpressing...
ZP2. This proteolytic destruction prevents sperm binding and provides from the egg cortical granules and cleaves the N-terminal domain of unable to fuse with mouse eggs. Following mouse fertilization, ovasta-binding to the 'humanized' zona pellucida, human sperm penetrate the site of gamete recognition is located in an N-terminal domain. After supports human sperm binding to transgenic zonae pellucidae and the transgenic mice. All four mouse lines are fertile, but only human ZP2 individual human zona proteins replace endogenous mouse proteins in mouse eggs, we also have established gain-of-function assays in which eliminating the function of either protein in these loss-of-function assays. 

Conclusion: Functional amyloid is present within the normal mouse epididymal lumen and within the sperm acrosome suggesting important roles in sperm maturation and fertilization. Further understanding of how these amyloid structures form in the absence of pathology as well as how these structures are reversed will not only provide important insight into normal reproductive events but also could have broad implications for the development of new therapies for neurodegenerative diseases.

Funding: Supported by NIH HD56182 (to G.A.C.)

**SUNDAY, APRIL 14, 2013**

**4:45 p.m. – 5:30 p.m.**

**LECTURE II**

**HUMAN GAMETE RECOGNITION IN TRANSGENIC MICE**

Jurrien Dean, MD

Laboratory of Cellular and Developmental Biology, NIDDK, National Institutes of Health, Bethesda, MD

For successful development, mammalian eggs must be fertilized by a single sperm. Failure of gamete recognition or absence of an effective post-fertilization block to polyspermy severely compromises reproductive fitness. The zona pellucida surrounding ovulated eggs plays a pivotal role in these biological imperatives and is essential for passage of the early embryo through the oviduct. The mouse and human zona pellucidae are composed of three (ZP1, ZP2, ZP3) and four (ZP1, ZP2, ZP3, ZP4) proteins, respectively. Mouse lines have been established that lack each of the three proteins. Zp1 null females are fertile and thus, this protein cannot be essential for gamete recognition. However, Zp2 and Zp3 null females do not form a zona matrix, rendering indeterminate the function of either protein in these loss-of-function assays. Taking advantage of the observation that human sperm will not bind to mouse eggs, we also have established gain-of-function assays in which individual human zona proteins replace endogenous mouse proteins in transgenic mice. All four mouse lines are fertile, but only human ZP2 supports human sperm binding to transgenic zonae pellucidae and the site of gamete recognition is located in an N-terminal domain. After binding to the ‘humanized’ zona pellucida, human sperm penetrate the zona matrix and accumulation in the perivitelline space where they are unable to fuse with mouse eggs. Following mouse fertilization, ovastacin, a metalloendoprotease conserved in mouse and human, is released from the egg cortical granules and cleaves the N-terminal domain of ZP2. This proteolytic destruction prevents sperm binding and provides a definitive block to polyspermy. Taken together, these experimental re-
Objective: We previously reported that the androgen receptor (AR) and RUNX2 physically interact. Here we set out to investigate how this interaction impacts cellular and molecular functions of AR and RUNX2 in prostate cancer (PCa) and bone cells, respectively.

Methods: Primary osteoblast cultures were prepared from newborn mouse calvariae. To assess their osteoclastogenic activity, these osteoblasts were co-cultured with murine splenic cells followed by enumeration of differentiated osteoclasts based on TRAP staining. C4-2B cells were used as the main PCa cell model. Cells were engineered with lentiviral vectors to facilitate doxycycline (dox)-mediated conditional expression of RUNX2 or silencing of SNAI2. Interactions between androgen and RUNX2 signaling were investigated by treating cells with dox and/or dihydrotestosterone (DHT; 10 nM). Global mRNA expression was profiled using the Illumina Beadchip platform. Global transcription factor occupancy was mapped by ChIP-seq. Expression pattern of selected genes and transcription factor occupancy at selected loci were validated by qPCR analyses of cDNA and chromatin immunoprecipitates, respectively. Cell invasiveness was assessed using BD chambers with Matrigel-coated inserts.

Results: RUNX2- and AR-driven gene expression generally antagonized each other in both reporter assays and mRNA analysis of respective target genes. Forced induction of RUNX2 in osteoblasts led to stimulated osteoclastogenesis from co-cultured splenocytes, and this stimulation was ablated in the presence of DHT. DHT treatment continued to antagonize RUNX2-mediated osteoblast-driven osteoclastogenesis when the pre-osteoclasts were derived from tfm mice (bearing dysfunctional AR), indicating that AR signaling in osteoblasts, not osteoclasts, was responsible for the restricted osteoclastogenesis. Whereas the androgen response of the RUNX2 gene network in osteoblasts remains to be fully deciphered, we have completed a detailed genome-wide study of the reciprocal RUNX2 response of the AR gene network in PCa cells. The results show that RUNX2 modulates androgen-mediated stimulation of target genes in a locus-dependent manner. Approximately 90% of androgen-stimulated genes were less responsive to DHT after induction of RUNX2 (by dox). Among these was NKX3.1, illustrating the ability of RUNX2 to act as an oncogene by attenuating androgen receptor-driven transcription of tumor suppressor genes. Interestingly, however, expression of the remaining 10% of androgen-stimulated genes was higher in the presence of both DHT and dox (RUNX2) as compared to DHT alone. High throughput sequencing of the respective chromatin immunoprecipitates (ChIP-seq) and confirmatory ChIP-qPCR assays demonstrated that the differential influence of RUNX2 on the androgen response was attributable to locus-specific organization of RUNX2-occupancy with respect to AR-occupied sites. For example, each of AR and RUNX2 alone stimulated expression SNAI2 by less than 50-fold, but together they stimulated SNAI2 expression by over 1000-fold, presumably through the rare co-occupancy of an enhancer located 4-kb upstream of the SNAI2 transcription start site. Furthermore, consistent with the pivotal role of SNAI2 in cancer metastasis, AR and RUNX2 synergistically activated PCa cell invasiveness and this synergism was lost upon SNAI2 silencing. Thus, the emerging role of RUNX2 in prostate carcinogenesis is attributable to (i) antagonism of the androgen response of tumor suppressor genes (e.g., NKX3.1) and (ii) augmentation of the androgen response of pro-metastatic genes (e.g., SNAI2).

Conclusion: The well-established bone protective role of androgens is attributable in part to the modulation of the bone master regulator RUNX2 by activated AR. Reciprocally, the emerging oncogenic role of RUNX2 in PCa is attributable in part to the locus-dependent modulation of the androgen response.

Funding: Funding provided by NH&MRC Australia and PCFA.
Objectives: Prolactin (PRL) is a polypeptide hormone that is predominantly synthesized in and secreted from lactotroph cells of the anterior pituitary gland. Although it is best known as the hormone that elicits lactation in mammals and takes its name from this function it is present in all vertebrates and plays role in both sexes. Prolactin has 300 different biological actions in metabolism, behavior, immunoregulation, osmoregulation, and sexual response. Our group has been interested in neuro regulation of orgasmic response in men and my presentation will focus on our role of prolactin signaling in male sexual behavior. PRL release and production is regulated by complex interplay between autoregulation and serotonin (5HT), oxytocin, dopamine (DA), GABA-signaling, and modulatory effects of estradiol.

Methods: 50 healthy male patients without erectile or ejaculatory dysfunction were evaluated in an IRB-approved protocol. PRL, dopamine, serotonin, adrenaline, and nor-adrenaline were measured in peripheral blood at baseline and 15 minutes following ejaculation and orgasm.

Results: Mean cohort age was 37.7+-16.7 years. Pre-ejaculation, prolactin and inhibin B were higher in men <40 years vs. older men (p<.04, p<.0002). Pre-ejaculation prolactin correlated inversely with BCM length at rest (p<.05). Pre-ejaculation inhibin B correlated inversely with BU diameter before stimulation (p<.03), BU minimum diameter during ejaculation (p<.05), and BCM length at rest and during ejaculation (p<.006, p<.012). Pre-ejaculation inhibin B correlated positively with BCM contractions (p<.03). Estradiol change post-ejaculation was negatively correlated with BU diameter at baseline (p<.02) and maximum diameter during ejaculation (p<.04). Post-ejaculation prolactin was significantly increased (p<.0001) and change was positively correlated with BU maximum diameter prior to ejaculation (p<.03). Post-ejaculation inhibin B change was negatively associated with ejaculation force (p<.04). Oxytocin was not changed in this group of normal men.

Conclusion: Although estradiol, prolactin and inhibin B interact with HPG axis, direct effects may occur via receptors for these hormones in reproductive tissues and central nervous system. Prolactin increased following ejaculation, and positively correlated with BU diameter during stimulation – a proxy for arousal. Estradiol and serotonin had negative effect on indicators of arousal consistent with their predicted roles as suppressors of sexual response in men. Increase in PRL level from baseline (delta) correlated with sensation of orgasm. Our data indicate that changes in PRL during acute phase of sexual response can be measured in peripheral blood. PRL may be a novel marker to aid in diagnosis of disorders of arousal, orgasm, and ejaculation in men. Further studies are underway to uncover how polymorphisms in genes involved in PRL, DA, 5HT, and sex steroids modulate one’s response to sexual cues and affect sexual behavior in men.
Tyrosine-kinase inhibitors (TKIs) are a group of drugs that inhibit the enzymes responsible for the activation of signal transduction cascades. TKIs are typically used as anti-cancer drugs. It is estimated that about 30% of the current effort of the pharmaceutical industry is devoted to the development of protein kinase inhibitors, especially TKIs. Imatinib was the first TKI developed against chronic myelogenous leukemia (CML). Imatinib inhibits several tyrosine kinases associated with disease. These enzymes include Bcr-Abl in patients with CML, c-kit in patients with gastrointestinal stromal tumors, and platelet-derived growth factor receptor (PDGFR) in patients with certain myeloproliferative disorders and dermatofibrosarcoma protuberans. Most patients appear to tolerate imatinib well, although clinical consequences presumably of PDGFR and c-kit inhibition have been reported. c-kit and PDGFRs are important signal transduction modulators in testis organogenesis, Leydig cell differentiation, steroidogenesis, and spermatogenesis. Accordingly, different studies document several cases of circulating testosterone reduction and gynecomastia in male patients treated with imatinib or other multitargeted tyrosine kinase inhibitors, such as sunitinib and dasatinib, and hypothesize a mechanism by which the drugs reduce testosterone production through the block of PDGFR and c-kit in the testis. Animal studies have shown that spermatogenesis is impaired in adult rats, dogs and monkeys treated with imatinib and that treatment before puberty may have more deleterious effects than exposure in mature animals. These observations raise concern that men taking this drug may have reduced sperm count, and recent publications described the development of oligozoospermia in boys after exposure to imatinib. The survival rate among individuals with cancer has improved over the past several years, and as a consequence the quality of life after cancer is coming to the forefront in this patient population, including the preservation of fertility. Clinical interventions with TKIs should pay attention to putative testicular side effects, a consequence of the disruption of physiological processes that depend on TKIs targets involved in testicular function.
The majority of testicular cancers are derived from germ cells and these tumours (TGCT) may occur in males of all ages, and each age-related type has a different pathogenesis. The most common TGCT of young adults (seminoma or non-seminoma) are derived from intratubular germ cell neoplasia, also known as carcinoma in situ testis (CIS). CIS cells display characteristics of developmentally arrested fetal gonocytes, with some features of more mature germ cells. Studies of CIS cells contributed to the characterisation of the gene expression profile of human gonocytes (including embryonic pluripotency factors) and germ cell maturation and meiosis regulation in pre- and post-natal testes. Germ cells are under control of somatic niche, and a developmental disruption of this cross-communication, which is most pronounced in genetic disorders of sex differentiation, leads to the maturation arrest and later neoplastic transformation. Subtle signs of gonadal dysgenesis, are also commonly found in men with a history of genital malformations and/or fertility problems, leading to the concept of testicular dysgenesis syndrome (TDS). The aetiology of the increasingly common TGCT and milder TDS phenotypes remains unknown, but likely involves predominantly environmental/lifestyle factors, which are modulated by genomic variation and epigenetic factors, thus explaining the individual- and population-level differences in the prevalence.

A rare type of TGCT which occurs in older men, spermatocytic seminoma, is caused by gain-of-function mutations of at least two genes (FGFR3, HRAS). Their identification revealed novel pathways involved in the control of proliferation and/or survival of post-pubertal spermatogonia.

Funding provided by the Danish Cancer Society, the Lundbeck Foundation, and the Andersen Foundation.

**TUESDAY, APRIL 16, 2013**

8:00 a.m. – 9:30 a.m.

**SYMPOSIUM IV – Infection and Immunity**

**HPV VACCINE IN MALES**

Anna R. Giuliano, PhD
Director, Center for Infection Research in Cancer, Moffitt Cancer Center, Tampa, FL

HPV infection causes a significant burden of cancerous and non-cancerous lesions in men. These include cancers of the penis, anal canal, and oropharynx, and genital warts. The proportion of cancers caused by HPV in men varies by anatomic site with this highest etiological fraction observed for anal cancers (~90%), cancers of the oropharynx (up to 70%), followed by the penis (~50%). To date, there are no reliable screening tools available to detect these cancers early when they are most amenable to treatment or to detect precancerous lesions for treatment and ultimate prevention of invasive tumors. The HPV types most strongly associated with cancers in men are HPV types 16 and 18, and HPV 6 and 11 cause ~90% of genital warts in both men and women. Recent reports indicate that the incidence of anal and HPV related oro-pharyngeal cancers are increasing among men, and in some countries in Europe, penile cancer, and its precursor lesions are also increasing.

HPV infection in the general male population is very common at the external genitals (~50%), less common at the anal canal (~12%), and uncommon in oral gargle rinses (~5%) of healthy men. While it remains unclear the rate and proportion of HPV infections that progress to cancer in men at any anatomic site, there is strong evidence that vaccination against HPV infection in men results in a robust antibody response and this response is associated with a decreased incidence of new HPV infections at the external genital skin and anal canal. In addition, the 4-valent HPV vaccine has been shown to significantly reduce the incidence of external genital lesions associated with the 4 vaccine types, as well as anal cancer precursor lesions. Based on this evidence the 4 valent vaccine has been licensed for the prevention of genital warts and anal cancer in males ages 9 – 26 years and the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP) has provided guidance for the routine vaccination of boys ages 9 – 22 years with catch up to age 26 years for men who have sex with men. Future research is needed to assess whether HPV vaccination will reduce oral infections and oropharyngeal and penile cancer incidence.

**TUESDAY, APRIL 16, 2013**

8:00 a.m. – 9:30 a.m.

**SYMPOSIUM IV – Infection and Immunity**

**SEXUALLY TRANSMITTED INFECTIONS AND INFERTILITY**

Deborah J. Anderson, PhD
Boston University School of Medicine
Boston, Massachusetts

The objective of this presentation is to review global STI surveillance estimates, the pathogenesis of male genital tract infections and their effects on male fertility. According to WHO estimates, 448 million new infections of curable STIs (primarily Chlamydia trachomatis, Neisseria gonorrhoea, Treponema pallidum, Trichomonas vaginalis) occur each year. In the United States, the annual number of cases of these common STIs exceeds 10 million. STIs are the main preventable cause of infertility. Chronic infections with gonorrhoea and possibly chlamydia in men cause urethral strictures and epidyimo-orchitis, which can cause infertility. Trichomonias infection can persist for years and cause nongonorrheal urethritis and chronic prostatitis which may also adversely affect fertility. Several organisms and inflammatory mediators produced during infections may affect sperm motility and function. Untreated HIV infection causes a dramatic decrease in motile sperm counts during advanced stages of disease progression, and certain antiretroviral drugs may affect sperm mitochondria function and motility. Other viral STIs may affect accessory gland function. Finally, men transmit STIs to their female partners where they can affect fertility and pregnancy outcome.

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Andrology, 2013, 1 (Suppl. 2), 35
INFERTILE, FAT AND WHEEZY – RABL2 FUNCTION

Jennifer Lo and Moira O’Bryan

Department of Anatomy and Developmental Biology, Monash University, Melbourne, Victoria 3800, Australia

Through the use of random mouse mutagenesis we have identified the small GTPase RAB-like 2 (RABL2) as a critical regulator of male fertility (Lo et al, PLoS Genetics 2012). RABL2 expression is highly enriched within haploid germ cells. Rabl2 is however, notably expressed in other tissues containing motile cilia. Similar to many other GTPases, we have shown the RABL2 cycles between a GTP-bound active form and a GDP-bound inactive form. In the active form RABL2 binds to a group of effector proteins that it delivers into the growing sperm tail compartment. RABL2 dysfunction, as exemplified in the Mot mouse line, results in male sterility characterized by a ~50% reduction in sperm output, sperm tails are shortened by 17% and have a severely compromised ability for progressive motility. Within germ cells RABL2 is associated with several components of the intra-flagellar transport (IFT) system. These data suggest a fundamental role for RABL2 in germ cell development, including a specific role in protein transport and sperm flagellar development.

Consistent with a role for RABL2 in motile cilia broadly, Mot mutant animals develop late onset congestive lung disease. Aspects of the pathology are similar to that observed in human primary ciliary dyskinesia. Other aspects are however, more consistent with alveolar protein secretory defects. This, and the observation that Mot mutant animals develop early onset steatosis (fatty liver disease), suggests a more fundamental role for RABL2 in protein transport. Within hepatocytes, RABL2 is associated with microtubules. Mot mutant animals have normal food intake, but decreased activity that ultimately leads to adult onset weight gain, glucose resistance and insulin insensitivity. Mutant hepatocytes show a pro-lipogenic phenotype as evidence for oxidative gene expression and the incorporation of oleic acid into fatty acids.

Collectively, these data identify RABL2 as an essential regulator of germ cell development, but also a regulator of health more broadly.


ENVIRONMENT AND MALE REPRODUCTIVE HEALTH: EPIDEMIOLOGIC EVIDENCE AND ITS INTERPRETATION

Russ Hauser, MD, ScD, MPH

Harvard School of Public Health, Harvard Medical School

Although progress has been made in the past several decades on understanding the potential impact of environmental exposures on male fertility, many environmental exposures have not been well studied. Furthermore, there is a gap in the translation to the clinic of scientific information on potential risk from exposures to environmental contaminants and adverse effects on male reproduction. There are hundreds of occupational and environmental chemicals with documented widespread human exposure. For only a small portion is there sufficient animal and/or human data to make firm conclusions on their impact on male fertility. This talk will present an overview on several classes of environmental chemicals for which there is sufficient or limited human data to make conclusions. I will discuss the sources and routes of human exposure to these classes of chemicals and briefly summarize the state of the literature on their potential health risk to male fertility. This talk will also provide insights regarding the interpretation of the
Epidemiologic literature, in particular its strengths and limitations. It will conclude with suggestions for how to close the gap on our understanding of potential male reproductive health risks from environmental exposures.

**TUESDAY, APRIL 16, 2013**
**10:45 a.m. – 12:15 p.m.**

**SYMPOSIUM V – Environment, Metabolism and Fertility**
**ENVIRONMENT AND SPERM ANEUPLOIDY**
Melissa J. Perry, George Washington University School of Public Health and Health Services, Washington DC

**Objectives:** Chromosomal abnormalities contribute substantially to reproductive problems, yet environmental risk factors have not been well investigated. We evaluated associations between PCBs, DDE and pyrethroid pesticide exposure with human sperm sex-chromosome disomy.

**Methods:** We conducted a cross-sectional study of 192 men from subfertile couples. Multiprobe fluorescence in situ hybridization (FISH) for chromosomes X, Y, and 18 was used to determine XX, YY, XY, and total sex chromosome disomy in sperm, using a semi-automated scoring method. Serum was analyzed for concentrations of 57 PCB congeners and p,p’-DDE and urine was analyzed for metabolites of contemporary use pyrethroid pesticides (TDCCA, CDCCA, and 3PBA). Poisson regression models were used to calculate incidence rate ratios (IRRs) for disomy by exposure quartiles controlling for potential confounders and semen parameters.

**Results:** The median percent disomy was 0.3 for XX and YY, 0.9 for XY, and 1.6 for total sex chromosome disomy. After adjustment, total sex chromosome disomy IRR for the highest vs. lowest quartile of serum DDE exposure was 1.27 (95% CI: 1.22-1.33). IRRs showed significantly increasing trends for increasing quartiles of p,p’-DDE in XX, XY, and total sex chromosome disomy. There was a significant increase in IRRs of YY, XY, and total sex chromosome disomy for increasing quartiles of the Σ-prevalent PCBs (118, 138, 156, and 180) and Σ-estrogenic PCBs (44, 49, 52, 101, 187, 174, 177, 157/201). There was also an increase in XY and total sex chromosome disomy for increasing quartiles of Σ-dioxin-like PCBs (95/66, 74, 77/110, 105/141, 118, 156, 167, 128, 138, 170). For XX disomy, however, IRRs decreased significantly with increasing quartiles for all PCB summary measures examined (Σ-prevalent, Σ-estrogenic, and Σ-dioxin-like). The pyrethroid metabolite TDCCA was significantly associated with increased IRRs for all three disomic conditions.

**Conclusions:** Our findings suggest DDE may be associated with increased XX, XY and total sex chromosome disomy, PCB exposures may be associated with increased YY, XY and total sex chromosome disomy, but decreased XX disomy, and the pyrethroid metabolite TDCCA may be associated increased total sex chromosome disomy. These findings require confirmation in further studies.

**Funding:** Funding provided by the National Institute of Environmental Health Sciences RO1ES017457.

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**SYMPOSIUM V – Environment, Metabolism and Fertility**
**RETHINKING THE ANTI-OXIDANT SYSTEM IN SPERMATOZOA**
Cristian O’Flaherty, DVM, PhD
Urology Department, McGill University and the Research Institute-McGill University Health Centre, Montréal, QC, Canada

Excessive levels of reactive oxygen species (such as superoxide anion, hydrogen peroxide (H₂O₂), nitric oxide and peroxynitrite (ONOO⁻)) in spermatozoa are associated with infertility. The infertile population has been increasing over the past few decades. ROS-mediated damage to sperm is a significant contributing factor in more than 30% of infertile men. Oxidative stress in spermatozoa targets all cell components affecting sperm motility, mitochondrial activity and DNA. Human spermatozoa posses limited antioxidant protection and are extremely vulnerable to oxidative stress. They have undetectable levels of catalase and limited amounts of glutathione peroxidase or superoxide dismutase. Peroxiredoxins (PRDXs) are SH-dependent, selenium- and heme-free peroxidases, highly expressed in virtually all living species. They can reduce both organic and inorganic hydroperoxides, and ONOO⁻: PRDXs are direct targets for H₂O₂ due to SH in their active site and therefore, readily oxidized and inactivated in cells exposed to low H₂O₂ levels. We recently characterized PRDXs and determined their importance in the sperm antioxidant system. The six PRDXs isoforms are differentially localized, but present in all, sub-cellular compartments of human spermatozoa (nucleus, acrosome, cytoplasm, midpiece and flagellum) and react with ROS. Sperm PRDX6 was low in 67% and 39% varicocele and idiopathic infertile patients, respectively. Sperm PRDX1 was only low in 42% of varicocele patients. Moreover, these isoforms are highly oxidized in their spermatozoa compared to healthy men. The oxidation ratio of PRDX1 and PRDX6 correlated with low sperm motility and high sperm lipid peroxidation and sperm DNA damage (measured by SCSA™) and multiple linear regression analysis showed that sperm lipid peroxidation, sperm DNA damage and progressive motility depend on the thiol-oxidation ratio of PRDX6, strengthening the importance of sperm PRDXs against oxidative stress. In conclusion, these data emphasize the importance of PRDXs in sperm function and offer a possible cause for men infertility. PRDXs may control ROS action locally in different sperm compartments and thus playing a central role as antioxidant enzymes and as modulators of ROS signaling.

**Funding:** CIHR, FRSQ and FQRNT.
POSTER SESSION I

Sunday, April 14, 2013
11:00 a.m. – 12:30 p.m.
Location: Regency West 4 – 6

ANDROGENS / ENDOCRINOLOGY

Poster# 13  EFFECTS OF LONG-TERM TREATMENT WITH TESTOSTERONE UNDECANOATE INJECTIONS IN 850 HYPOGONADAL MEN ON WAIST CIRCUMFERENCE, BODY WEIGHT AND BMI
Farid Saad, DVM, PhD¹, Aksam Yassin, MD, PhD², Ahmad Haider, MD, PhD³ and Michael Zitzmann, MD, PhD⁴
¹Bayer Pharma AG; ²Institute of Urology and Andrology, Norderstedt, Germany; ³Private Urology Practice, Bremerhaven, Germany; ⁴University of Muenster, Centre of Reproductive Medicine and Andrology
(Presented By: Farid Saad, DVM, PhD)

Poster# 14  ORAL ENCLOMIPHENE CITRATE LOWERS IGF-1 IN MEN WITH SECONDARY HYPOGONADISM WHILE RAISING TESTOSTERONE, LH AND FSH: IMPLICATIONS FOR CANCER PREVENTION
Ronald Wiehle, PhD and Gergory Fontenot, PhD
Repros Therapeutics
(Presented By: Ronald Wiehle, PhD)

Poster# 15  DIFFERENTIAL EFFECTS OF COX-2 (AN INFLAMMATORY MEDIATOR) IN NORMAL AND CANCEROUS PROSTATE EPITHELIAL CELLS
Sharika Hagan, PhD, Prithiviraj Elumalai, Kamatchi Anbazhagan, Manish Ranjan, Asim Abdel Mageed, PhD and Suresh Sikka, PhD
Tulane University School of Medicine, New Orleans, LA
(Presented By: Sharika Hagan, PhD)

Poster# 16  ADRENALECTOMY AND DEXAMETHASONE TREATMENT INDUCED CHANGES IN TESTICULAR MORPHOLOGY AND SPERM PARAMETERS IN ADULT RATS
Erick Silva, PhD¹, Vanessa Vendramini, PhD¹, Adriana Restelli, PhD¹, Ricardo Bertolla, PhD¹, Wilmas Kempinas, PhD² and Maria Christina Avellar, PhD¹
¹Universidade Federal de São Paulo; ²Universidade Estadual Paulista
(Presented By: Erick Silva, PhD)

Poster# 17  DRUG LIGAND-INDUCED ACTIVATION OF TRANSLOCATOR PROTEIN (TSPO) STIMULATES STEROID PRODUCTION BY LEYDIG CELLS FROM THE TESTES OF AGED BROWN NORWAY RATS
Jin Yong Chung, PhD, Haolin Chen, PhD, Andrew Midzak, PhD, Vassilios Papadospoulos, PhD and Barry Zirkin, PhD
(Presented By: Jin Yong Chung, PhD)

ENVIRONMENT / TOXICOLOGY

Poster# 18  EFFECT OF ROSMARINIC ACID ON LEYDIG CELLS APOPTOSIS AFTER EXPOSED WITH ELECTROMAGNETIC FIELDS (EMF) IN RATS
Arash Khaki, DVM, PhD
Women’s Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
(Presented By: Arash Khaki, DVM, PhD)

Poster# 19  EFFECT OF CARNITINE ON THE SPERMATOGONIUM POPULATION AND SPERMATIC PARAMETERS OF RATS TREATED WITH ETOPOSIDE IN THE PREPUBERTAL PHASE
Fátima Okada, MSc, Taiza Stumpp, Postdoctorate and Sandra Miraglia, PhD and Habilitation
Federal University of Sao Paulo
(Presented By: Sandra Miraglia, PhD and Habilitation)

Poster# 20  CARNITINE PARTIALLY PROTECTS THE TESTIS AGAINST THE LATE DAMAGE PRODUCED BY DOXORUBICIN ADMINISTRATION TO PREPUBERTAL RATS
Regina Cabral, PhD, Student, Vanessa Vendramini, Co-Advisor, Fátima Okada, Collaborator, Taiza Stumpp, Collaborator and Sandra Miraglia, Advisor
Federal University of São Paulo/Brazil
(Presented By: Regina Cabral PhD, Student)
POSTER SESSION I

Poster# 21  EFFECTS OF ORAL ADMINISTRATION OF THE FEMALE CONTRACEPTIVE ETHINYL ESTRADIOL (EE) ON PENILE DEVELOPMENT
Lilian Okumu¹, Willie Bidot¹, Tim Braden², Liz Simon¹ and Hari Goyal¹
¹Department of Biomedical Sciences, College of Veterinary Medicine, Nursing and Allied Health, Tuskegee University, Tuskegee, Alabama; ²Department of Anatomy, Physiology and Pharmacology, College of Veterinary Medicine, Auburn University, Auburn, Alabama
(Presented By: Lilian Okumu)

Poster# 22  THE EFFECT OF CYCLOPHOSPHAMIDE ON HUMAN FETAL TESTIS XENOTRANSPLANTS: HISTOLOGY, GENE EXPRESSION PATTERNS AND BIOLOGICAL PATHWAYS
Mary Samplaski, MD¹, Yingchun Zhu, MD¹, Huayun Hou, BS², Gary Bader, PhD², Bharati Bapat, PhD², Keith Jarvi, MD¹, Colin Mc Kerlie, DVM, PhD² and Kirk Lo, MD¹
¹Mount Sinai Hospital; ²University of Toronto
(Presented By: Mary Samplaski MD)

EPIDIDYMIS / VAS DEFERENS / SEMINAL VESICLES

Poster# 23  ANALYSIS OF PHOSPHOPEPTIDE CHANGES AS SPERMATOZOA ACQUIRE FUNCTIONAL COMPETENCE IN THE EPIDIDYMIS DEMONSTRATES CHANGES IN THE POST-TRANSLATIONAL MODIFICATION OF IZUMO1
Mark Baker, PhD and John Aitken, PhD
University of Newcastle
(Presented By: Mark Baker, PhD)

Poster# 24  CHARACTERIZATION OF FERTILITY IN RNASE9 KNOCKOUT MICE
Andrew Westmuckett, PhD¹, Oana Herlea-Pana, PhD¹, Edward Nguyen, BS², Antonio Alvau, BS², Ana Maria Salicioni, PhD² and Kevin Moore, MD¹
¹Oklahoma Medical Research Foundation; ²University of Oklahoma Health Sciences Center; ³University of Massachusetts, Amherst
(Presented By: Andrew Westmuckett, PhD)

Poster# 25  APOPTOSIS AND NF-KB OVEREXPRESSISON IN THE SMOOTH MUSCLE CELLS OF RAT VAS DEFERENS FOLLOWING H2 RECEPTORS ANTAGONIST TREATMENT
Estela Sasso-Cerri, PhD¹,², Juliana Koshimizu Pharmaceutical³,², Flávia Luciana Beltrame, PhD, Student², José Paulo de Pizzol, Jr., Graduation Student¹,², Breno Henrique Caneguim, PhD, Professor¹,² and Paulo Sérgio Cerri, PhD, Professor¹,²
¹Department of Morphology, Dental School of São Paulo State University; ²Brazil; ³Stiefel Laboratories Intl.; ⁴Federal University of São Paulo (UNIFESP)
(Presented By: Estela Sasso-Cerri, PhD)

FERTILIZATION / GERM CELL DIFFERENTIATION / REPRODUCTIVE DEVELOPMENT

Poster# 26  CHARACTERIZATION OF SPACA7, A NOVEL ACROSOMAL PROTEIN INVOLVED IN FERTILIZATION
Edward Nguyen, BS¹, Andrew Westmuckett, PhD² and Kevin Moore, MD²
¹University of Oklahoma Health Sciences Center; ²Oklahoma Medical Research Foundation
(Presented By: Edward Nguyen BS)

Poster# 27  QUANTIFICATION OF DNA BREAKS IN HIGHLY-PURIFIED POPULATION OF MOUSE SPERMATIDS
Julien Massonneau MSc (ongoing), Marie-Chantal Grégoire, Olivier Simard and Guylain Boissonneault PhD
Département de biochimie, Faculté de médecine et des sciences de la santé, Université de Sherbrooke, Sherbrooke, Québec, Canada
(Presented By: Julien Massonneau MSc (ongoing))

GENETICS

Poster# 28  FREQUENCY OF Y CHROMOSOME MICRODELETIONS AMONG INFERTILE MALES IN ARMENIA
Ruben Burnazyan, PhD, Nora Nalbandyan, PhD and Tamara Sargsyan, Prof
(Presented By: Ruben Burnazyan, PhD)
POSTER SESSION I

Poster# 29  
NOVEL METHYLATION-SPECIFIC QUANTITATIVE PCR TEST FOR THE DIAGNOSIS OF KLINEFELTER SYNDROME  
Akanksha Mehta, MD, Anna Mielnik, Peter Schlegel, MD and Darius Paduch, MD, PhD  
Weill Cornell Medical College  
(Presented By: Akanksha Mehta, MD)

INFERTILITY / ART / MALE CONTRACEPTION

Poster# 30  
EFFECTS OF PDE5 INHIBITORS ON SPERM MOTILITY, SPERM MEMBRANE PERMEABILITY, AND SPERM DNA STRUCTURE  
Evlalia Vlachopoulou, BS¹, Stavros Gratsias, MD¹, Athanasios Lazaridis, MD¹, Maria Ovrenovits, MD, PhD¹, Dimitrios Giannakis, MD, PhD¹, Dimitrios Baltogiannis, MD, PhD¹, Georgios Vartholomatos, BS, PhD², Leandros Lazaros, BS, PhD³, Ioannis Georgiou, BS, PhD³ and Nikolaos Sofikitis, MD, PhD³  
¹Department of Urology Ioannina University; ²Department of Molecular Biology; ³Department of Obstructive and Gynecology Ioannina University  
(Presented By: Evlalia Vlachopoulou BS)

Poster# 31  
EFFECT OF OMEGA-3, FATTY ACIDS ON OVARIAN TISSUE IN POLY CYSTIC OVARIAN (PCO) RATS  
Elaheh Ouladsahebmadarek, MD, Arash Khaki, DVM, PhD, Laya Farzadi, MD and Amir Afshin Khaki, PhD  
Women’s Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.  
(Presented By: Arash Khaki DVM PhD)

Poster# 32  
RECOVERY OF SPERM IN THE URINES FOLLOWING MASTURBATION IN 407 NON AZOOSPERMIC MALE PARTNERS OF INFERTILE COUPLES WITH HYPOSPERMIA ON A PREVIOUS SPERM ANALYSIS: PRELIMINARY DESCRIPTIVE RESULTS  
Roger Mieusset, PhD, MD, Marie Walschaerts, PhD and Thierry Almont  
Male Sterility Center  
(Presented By: Roger Mieusset, PhD, MD)

Poster# 33  
SUCCESSFUL TESTICULAR SPERM RETRIEVAL IN KLINEFELTER ADOLESCENTS TREATED WITH AT LEAST ONE YEAR OF TOPICAL TESTOSTERONE AND AROMATASE INHIBITOR  
Akanksha Mehta, MD, Alexander Bolyakov, MCSc, Jordan Roosma, Peter Schlegel, MD and Darius Paduch, MD, PhD  
Weill Cornell Medical College  
(Presented By: Akanksha Mehta, MD)

Poster# 34  
EFFECTS OF LOW DOSES OF SILDENAFIL ON SEMEN QUALITY  
Sotirios Koukos, MD, MD, Stavros Gratsias, MD, MD, Athanasios Lazaridis, MD, Stavros Tsampalas, MD, PhD, Evlalia Vlachopoulou, BS, Diamantis Daphnis, BS, PhD, Grigoris Daligkaros, MD, Konstantinos Zotos, MD, Georgios Semini, MD, Sotirios Stavrou, MD, Dimitrios Baltogiannis, MD, PhD, Ioannis Giakoumakis, MD, Dimitrios Giannakis, MD, PhD and Nikolaos Sofikitis, MD, PhD  
¹Department of Urology, School of Medicine; ²Mediterranean Fertility Center & Genetic Services  
(Presented By: Sotirios Koukos, MD)

Poster# 35  
FUNCTION OF HEN1 IN THE STABILIZATION OF PIRNAS DURING MAMMALIAN SPERMATOGENESIS AND MALE FERTILITY  
Shu Ly Lim, PhD, Duangporn Jamsai, PhD, Francesco E. Marino Master and Moira O’Bryan, PhD  
Monash University  
(Presented By: Shu Ly Lim, PhD)

Poster# 36  
OXIDATIVE STRESS AND SPERM DNA DAMAGE: ROLE IN MALE INFERTILITY AND IMPACT OF LIFESTYLE AND OCCUPATIONAL FACTORS  
Monis Bilal Shamsi, MSc, Tarannum Hasan, MSc, Dinesh Kumar, MBBS, MD (Pursuing) and Rima Dada, MD, PhD  
¹Laboratory for Molecular Reproduction and Genetics, Department of Anatomy, All India Institute of Medical Sciences; ²Laboratory for Molecular Reproduction and Genetics, Department of Anatomy, All India Institute of Medical Sciences, New Delhi, India  
(Presented By: Monis Bilal Shamsi, MSc)

Poster# 37  
ELECTROEJACULATION IN PSYCHOGENIC ANEJACULATION – A SINGLE-CENTER EXPERIENCE  
Timo F.W. Soeterik, Bsc, Paul W. Veenboer, MD and M.T.W.Tycho Lock, MD  
University Medical Center Utrecht, Department of Urology  
(Presented By: Timo F.W. Soeterik, Bsc)
MALE SEXUAL FUNCTION

Poster# 38  THE RELATION OF CIRCUMCISION TO DISTAL PENILE SENSITIVITY
Joon Yong Kim and P.B.M. Kim
Philip and Paul Medical Institution
(Presented By: Joon Yong Kim)

Poster# 39  VALIDITY AND RELIABILITY OF A SMARTPHONE APPLICATION FOR THE ASSESSMENT OF PENILE DEFORMITY IN PEYRONIE’S DISEASE
Ryan Hsi, MD¹, James Hotaling, MD, MS¹, Andrea Hartzler, PhD² and Thomas Walsh, MD, MS¹
¹Department of Urology, University of Washington, Seattle, WA; ²Department of Global Health, University of Washington, Seattle, WA
(Presented By: Ryan Hsi, MD)

Poster# 40  INFLUENCE OF SCHWANN CELL DEGENERATIVE CHANGE IN DORSAL NERVE OF PENIS ON ERECTILE DYSFUNCTION IN AGING
Prakash Seppan, PhD¹, Suresh Sekar, PhD², Prithviraj Elumai, PhD³, Venkata lakshmi Nagella, MSc⁴, Karthik Ganesh Mohanraj, MSc⁴, Ganesh Lakshmanan, MSc⁴, Anuradha Mohanraj, MSc⁴ and Dinesh Premavathy, MSc⁴
¹Department of Anatomy, University of Madras, India; ²Department of Anatomy, Sathyabama University, India
(Presented By: Prakash Seppan, PhD)

Poster# 41  SHOCK WAVE THERAPY IN PATIENTS WITH PEYRONIE’S DISEASE – OUR EXPERIENCE
Libor Zamecnik¹, Dana Dolezalova², Vladimir Voboril², Yvona Pichlikova², Monika Zakovecova², Otakar Capoun², Zuzana Valova², Roman Sobotka², Petr Macek² and Tomas Hanus²
¹Dept. of Urology, 1st Medical Faculty, Charles University, General Teaching Hospital, TH Klinika, Prague, Czech Republic; ²Dept. of Urology, 1st Medical Faculty, Charles University, General Teaching Hospital, Prague, Czech Republic
(Presented By: Libor Zamecnik)

Poster# 42  LONG-TERM CONTINUOUS TREATMENT WITH AVANAFIL PROMOTES RECOVERY OF ERECTILE FUNCTION IN A RAT MODEL OF POSTPROSTATECTOMY INDUCED ERECTILE DYSFUNCTION
Ahmet Gokce, MD, George Lasker, Sree Harsha Mandava, Zakaria Abd Elmageed, PhD, Landon Trost, MD, Philip Kadowitz, Suresh Sikka, PhD and Wayne Hellstrom, MD, FACS
Tulane University School of Medicine, New Orleans, LA
(Presented By: Ahmet Gokce, MD)

Poster# 43  BOTULINUM TOXIN RESULTS IN DECREASED PROLIFERATION AND APOPTOSIS IN THE RAT BULBOUS SPONGIOSUM
Sree Harsha Mandava, Zakaria Abd Elmageed, PhD, George Lasker, Ahmet Gokce, MD, Landon Trost, MD, Philip Kadowitz, Wayne Hellstrom, MD, FACS and Suresh Sikka, PhD
Tulane University School of Medicine, New Orleans, LA
(Presented By: Sree Harsha Mandava)

OTHER

Poster# 44  HUMAN PROSTASOMES EXPRESS GLYCOLYTIC ENZYMES WITH CAPACITY FOR ATP PRODUCTION
Göran Ronquist, Bo Ek¹, Anneli Stavreus-Evers², Anders Larsson² and Gunnar Ronquist³
¹Department of Analytical Chemistry, Science for Life Laboratory, Uppsala University, SE-751 24 Uppsala, Sweden; ²Department of Women’s and Children’s Health, Uppsala University, Uppsala, Sweden; ³Department of Medical Sciences, Clinical Chemistry, University Hospital, SE-751 85 Uppsala, Sweden
(Presented By: Göran Ronquist)

PROSTATE / TESTIS CANCER / CLINICAL UROLOGY

Poster# 45  THE APPLICATION OF SCANNING ELECTRON MICROSCOPY AND X-RAY ENERGY DISPERSIVE MICROANALYSIS TO THE STUDY OF THE HUMAN TESTIS
Shirley Siew, MD, PhD
Michigan State University
(Presented By: Shirley Siew, MD, PhD)
Poster# 46  INCIDENCE OF PROSTATE CANCER IN HYPOGONADAL MEN ON LONG-TERM TREATMENT WITH TESTOSTERONE UNDECANOATE INJECTIONS
Farid Saad, DVM, PhD¹, Aksam Yassin, MD, PhD², Ahmad Haider, MD, PhD³ and Michael Zitzmann, MD, PhD⁴
¹Bayer Pharma AG; ²Institute of Urology and Andrology, Norderstedt, Germany; ³Private Urology Practice, Bremerhaven, Germany; ⁴University of Muenster, Centre of Reproductive Medicine and Andrology
(Presented By: Farid Saad, DVM, PhD)

Poster# 47  WHERE SHOULD INTRATESTICULAR RESISTIVE INDEX BE MEASURED?
Etai Goldenberg, MD¹, Joel Hillelsohn, BS², Siobhan Hartigan, BS³ and Bruce Gilbert, MD, PhD⁴
¹Smith Institute for Urology, Hofstra North Shore LIJ School of Medicine; ²Albert Einstein School of Medicine; ³George Washington University School of Medicine & Health Sciences
(Presented By: Etai Goldenberg, MD)

Poster# 48  IN SEARCH OF DE NOVO STEROID BIOSYNTHESIS IN HUMAN PROSTATE CELL LINES AND BIOPSIES
Monica Sakai, DVM, PhD¹, Daniel Martinez-Arguelles, MD, PhD², Vassilios Papadopoulos, DPharm, PhD²³
¹The Research Institute of the McGill University Health Center and the Department of Medicine, McGill University, Canada; ²MUHC – McGill; ³The Research Institute of the McGill University Health Center and the Department of Medicine, Biochemistry and Pharmacology & Therapeutics, McGill University, Canada
(Presented By: Monica Sakai, DVM, PhD)

SPERM FUNCTION / SEMEN ANALYSIS

Poster# 49  COMPREHENSIVE GENOMIC AND PROTEOMIC PROFILING OF SPERM IN COUPLES UNDERGOING IVF TREATMENT
Luke Simon, PhD, Tyson Meyer, Lihua Liu, MD, Drew Duttschi, MD, Benjamin Emery, PhD, Shaoqin Ge, PhD, Kenneth Aston, PhD, Timothy Jenkins, BSc and Douglas Carrell, PhD, HCLD
University of Utah
(Presented By: Luke Simon, PhD)

Poster# 50  INVESTIGATION ON THE VARIATION OF SEMEN PARAMETERS IN SEQUENTIALLY COLLECTED HUMAN SEMEN SPECIMENS FOR INTRAUTERINE INSEMINATION
Amjad Hossain, PhD and John Phelps, MD
Associate Professor, Department of Ob/Gyn, University of Texas Medical Branch at Galveston
(Presented By: Amjad Hossain, PhD)

Poster# 51  CHARACTERIZATION OF SUMOYLATED PROTEINS IN HUMAN SPERM
Sara Marchiani, PhD¹, Beatrice Ricci, Student¹, Lara Tamburrino, PhD¹, Monica Muratori, PhD¹, Marta Cambi, PhD, Student¹, Daniele Nosì, PhD², Gianni Forti, Professor¹ and Elisabetta Baldi, Professor¹
¹Dept. Clinical Physiopathology, University of Florence; ²Department of Anatomy, Histology and Forensic Medicine, University of Florence
(Presented By: Sara Marchiani, PhD)

Poster# 52  CATSPER CALCIUM CHANNELS IN HUMAN SPERMATOZOA AND THEIR ROLE IN RESPONSIVENESS TO PROGESTERONE (P)
Lara Tamburrino, PhD, Sara Marchiani, PhD, Marta Cambi, PhD, Student, Monica Muratori, PhD, Gianni Forti, Professor and Elisabetta Baldi, Professor
Department of Clinical Physiopathology, University of Florence
(Presented By: Lara Tamburrino, PhD)

Poster# 53  REITERATING THE ESSENTIALITY OF CAPACITATION FOR FERTILIZATION VIA SPERM METABOLISM: ROLE OF PYRUVATE DEHYDROGENASE COMPLEX AND ITS E3 SUBUNIT, DIHYDROLIPAMIDE DEHYDROGENASE
Durgesh K. Singh, MSc¹, Panneerdoss S., PhD², Kameshwari D.B., MSc¹, Archana B. Siva, PhD¹ and Shivaji Sisinthy, PhD¹
¹Centre for Cellular and Molecular Biology (CSIR), India; ²Greehey Children Cancer Research Institute (GCCRI), University of Texas Health Science Center, San Antonio, Texas
(Presented By: Durgesh K. Singh, MSc)
Poster# 54  
MICRONUTRIENT SUPPLEMENTATION INTAKE FOR 3 MONTH SIGNIFICANTLY INCREASES SPERM-HYALURONAN BINDING ASSAY VALUE COMPARED TO CONTROL GROUP  
Erik Huber, FEBU, Florian Bodner Cand med¹, Markus Lipovac², Alexander Schütz³ and Martin Imhof Univ-Doz Prim²  
¹Medical University of Vienna; ²Department for Obstetrics and Gynecology, Landesklinikum Weinviertel, Korneuburg, Niederösterreich, Austria; ³Adebar Wunschkinderklinik, Wiener Neustadt, Niederösterreich, Austria  
(Presented By: Erik Huber, FEBU)

Poster# 55  
IMMUNOREACTIVE SPERM ANTIGENS RECOGNIZED BY ANTISPERM ANTIBODIES OBTAINED FROM POLISH AND CZECH INFERTILE POPULATIONS – PROTEOMIC ANALYSIS  
Karolina Nowicka-Bauer, MSc¹, Marzena Kamieniczna, MD¹, Jan Cibulka, PhD², Zdenka Ulcova-Gallova, MD² and Maciej Kurpisz, MD, PhD³  
¹Institute of Human Genetics Pol. Acad. Sci., Poznan, Poland; ²Department of Gynecology and Obstetrics, Charles University and Faculty Hospital, Pilsen, Czech Republic; ³Institute of Human Genetics Pol. Acad. Sci.  
(Presented By: Maciej Kurpisz, MD, PhD)

Poster# 56  
MOVED TO POSTER 102.5

SPERMATOGENESIS / STEROIDOGENESIS / TESTIS BIOLOGY

Poster# 57  
HYPOXIA VS GONADOTROPINS IN THE REGULATION OF TESTICULAR MA-10 CELL FUNCTIONS  
Anand Kumar, MD, Lata Rani, PhD and Bodhana Dhole, MSc  
Department of Reproductive Biology, All India Institute of Medical Sciences  
(Presented By: Anand Kumar, MD)

Poster# 58  
MITOCHONDRIAL MATRIX CONFIGURATION AND CYTOCHROME C RELEASE DURING TESTICULAR GERM CELL APOPTOSIS IN AGED RAT  
Sekar Suresh, PhD¹, Govindaraj Sumathy, PhD¹, Seppan Prakash, PhD² and Sanmugam Samantham, MSc²  
¹Sathyabama University; ²University of Madras  
(Presented By: Sekar Suresh, PhD)

Poster# 59  
UPREGULATION OF MIWI2 BY HYPOXIA IS ESSENTIAL FOR SPERMATOGENESIS  
Yung-Ming Lin¹, Ching-Yi Lin, Master² and Chun-Wun Lu, PhD³  
¹Department of Urology, National Cheng Kung University Medical College and Hospital; ²Dept of Urology, College of Medicine, NCKU, Taiwan  
(Presented By: Yung-Ming Lin)

Poster# 60  
DEEP SEQUENCING IDENTIFIES ALTERED MIRNA, PIRNA AND ENDO-SIRNA PROFILES IN PATIENTS WITH DIFFERENT TYPES OF NON-OBSTRUCTIVE AZOOSPERMIA  
Hui Tian¹ and Fei Sun²  
¹School of Life Sciences, University of Science and Technology of China, Hefei, China; ²School of Life Sciences, University of Science and Technology of China  
(Presented By: Fei Sun)
**POSTER SESSION II**

Monday, April 15, 2013  
11:00 a.m. – 12:30 p.m.  
*Location: Regency West 4 – 6*

**ANDROGENS / ENDOCRINOLOGY**

Poster #61  
**COMPARISON OF CELL TYPES IN THE RAT LEYDIG CELL LINEAGE AFTER ETHANE DIMETHANESULFONATE TREATMENT**  
Jingjing Guo, MD¹, Hongyu Zhou, MS², Bing-Bing Chen, MD³, Zhi-Jian Su, PhD³, Gui-Min Wang, PhD³, Claire Q.F. Wang, PhD³, Qingquan Lian, PhD³, Yunfei Xu, MD⁴, and Renshan Ge, PhD⁴  
¹Institute of Reproductive Biomedicine; ²Department of Pharmacology, School of Pharmacy, Wenzhou Medical College; ³Institutes of Life and Health Engineering, Jinan University; ⁴The Second Affiliated Hospital of Wenzhou Medical College; ⁵Department of Urology, the Affiliated 10th People’s Hospital of Tongji University  
(Presented By: Jingjing Guo, MD)

Poster #62  
**IDENTIFICATION OF MIRNAS OF RAT STEM, PROGENITOR, IMMATURE AND ADULT LEYDIG CELLS**  
Ren-Shan Ge, MD¹, Yufei Zhang, MS², Jingjing Guo, MD³, Kaiming Yuan, PhD³, Zhi-Jian Su, MD³, Yanhui Chu, PhD³ and Qingquan Lian, MD³  
¹Wenzhou Medical College; ²Mudanjiang Medical University; ³Jinan University  
(Presented By: Ren-Shan Ge, MD)

Poster #63  
**THE MOST USEFUL INDICATOR FOR A DIAGNOSIS AS TESTOSTERONE DEFICIENCY SYNDROME IS BIOAVAILABLE TESTOSTERONE USING LC MS/MS IN JAPANESE POPULATION**  
Eitetsu Koh, PhD, MD, Masaki Taya, MD, Masashi Iijima, MD and Mikio Namiki, PhD, MD  
Department of Integrative Cancer Therapy and Urology, Kanazawa University Graduate School of Medical Science, Kanazawa, Japan  
(Presented By: Eitetsu Koh, PhD, MD)

Poster #64  
**EVIDENCE OF OXIDATIVE STRESS IN MIDDLE AGE MALES WITH OSTEOPOROSIS: STUDIES OF OXIDIZED AND REDUCED COENZYME Q10**  
Antonio Mancini, MD¹, Sebastiano Raimondo, MD², Francesco Ciro Tamburrelli, MD², Roberto Festa, MD², Chantal Di Segni, Trainee², Mariasara Persano, MD², Luca Tiano, BD³, Alfredo Pontecorvi, MD³ and Gian Paolo Littarru, MD³  
¹Department of Internal Medicine, Division of Endocrinology, Catholic University of the Sacred Heart; ²Department of Internal Medicine, Division of Endocrinology, Catholic University of the Sacred Heart, Rome, Italy; ³Department of Spine Surgery, Catholic University of the Sacred Heart, Rome, Italy; ⁴Department of Molecular Pathology, Polytechnic University of the Marche, Ancona, Italy; ⁵Institute of Biochemistry, Polytechnic University of the Marche, Ancona, Italy  
(Presented By: Antonio Mancini, MD)

Poster #65  
**THE INSL3 GENE IS A DIRECT TARGET FOR THE NUCLEAR RECEPTOR COUP-TFII IN MA-10 LEYDIG CELLS**  
Raifish Mendoza, MSc, Etienne Camiré, Catherine Brousseau, MSc and Jacques J. Tremblay, PhD  
Université Laval-Centre de recherche du CHUQ  
(Presented By: Raifish Mendoza, MSc)

**ENVIRONMENT / TOXICOLOGY**

Poster #66  
**SPERM MRNAS ARE MOLECULAR MARKERS OF MINIMAL TESTICULAR INJURY IN RATS**  
Linnea Anderson, MSc¹, Edward Dere, PhD², Susan Hall, BS¹ and Kim Boekelheide, MD, PhD²  
¹Brown University; ²Brown University, Rhode Island Hospital  
(Presented By: Linnea Anderson, MSc)

Poster #67  
**ALUMINIUM CHLORIDE INDUCED ALTERATIONS IN THE TESTIS AND SPERMATOZOA OF RATS AND ITS POSSIBLE AMELIORATION BY VITAMIN –E**  
Ramalingam Venugopal, PhD³, Panneerdoss Subbarayalu, PhD³ and Suryavathi Viswanadhapalli, PhD³  
³Department of Zoology, K.M. Centre for Post Graduate Studies; ³Greehey Children’s Cancer Research Institute, University of Texas Health Science Center, San Antonio, Texas; ³Department of Medicine/Nephrology, University of Texas Health Science Center, San Antonio, Texas  
(Presented By: Ramalingam Venugopal, PhD)
ACUTE SENSITIVITY OF THE PREPUBERTAL MOUSE TESTIS TO DI-N-BUTYL PHTHALATE IDENTIFIES A HIERARCHY OF EFFECTS IN THE DEVELOPING TESTIS
Catherine Itman, PhD, Sarah Moody, Bachelor of Biomedical Science and Kate Loveland, PhD
Monash University
(Presented By: Catherine Itman, PhD)

FINASTERIDE 1 MG/DAILY DECREASES SPERMATOGENESIS, IMPAIRS SPERM MATURITY, DECREASES TESTOSTERONE AND INCREASES LH LEVELS IN YOUNG MEN IN REPRODUCTIVE AGE: INITIAL REPORT.
Jorge Hallak MD, PhD, Medical Assistant¹,², Juliana Pariz MSci³,⁴, Andressa Ferrette Graduate Student⁵,⁶ and Patricia Pieri PhD⁷,⁸,⁹
¹Reproductive Toxicology Unit – Department of Pathology; ²University of Sao Paulo Medical School. Androscience – High Complexity Andrology Laboratory; ³Referral Laboratory for Andrology, Cryopreservation and Men`s Reproductive Health, SP-Brazil, Section of A; ⁴Androscience – High Complexity Andrology Laboratory; ⁵Referral Laboratory for Andrology, Cryopreservation and Men`s Reproductive Health, SP-Brazil, Section of Andrology, Division of Urology, Department of Surgery, University of Sao Paulo Medical School; ⁶Section of Andrology, Division of Urology, Department of Surgery, University of Sao Paulo Medical School, Reproductive Toxicology Unit – Department of Pathology; ⁷University of Sao Paulo Medical School; ⁸Molecular and Cellular Biology Laboratory, Department of Neurology, University of Sao Paulo Medical School, SP, Brazil. Androscience – High Complexity Andrology Laboratory; ⁹Referral Laboratory for Andrology, Cryopreservation and Men`s Reproductive Health, SP-Brazil
(Presented By: Jorge Hallak MD, PhD, Medical Assistant)

MARIJUANA CONSUMPTION AFFECTS THE MALE REPRODUCTIVE HEALTH
Andressa Ferrette, Post-Graduate Student¹,², Juliana Pariz, MSci³,⁴, Patricia Pieri, PhD⁶,⁹ and Jorge Hallak MD, PhD, Medical Assistant³,⁴,⁷
¹Section of Andrology, Division of Urology, Department of Surgery, University of Sao Paulo Medical School. Reproductive Toxicology Unit – Department of Pathology; ²University of Sao Paulo Medical School; ³Reproductive Toxicology Unit – Department of Pathology; ⁴University of Sao Paulo Medical School. Androscience – High Complexity Andrology Laboratory; ⁵Referral Laboratory for Andrology, Cryopreservation and Men`s Reproductive Health, SP-Brazil.; ⁶Molecular and Cellular Biology Laboratory, Department of Neurology, University of Sao Paulo Medical School, SP, Brazil. Androscience – High Complexity Andrology Laboratory; ⁷Referral Laboratory for Andrology, Cryopreservation and Men`s Reproductive Health, SP-Brazil, Section of Andrology, Division of Urology, Department of Surgery, University of Sao Paulo Medical School
(Presented By: Andressa Ferrette Pos-Graduate Student)

EPIDIDYMAL EPITHELIAL STRUCTURES IN WILD RODENTS FROM BRAZILIAN ATLANTIC FOREST
Mariana Neves, PhD¹, Tatiana Menezes, Graduate Student¹, Eric Hill² and Sylvie Breton, PhD³
¹Federal University of Viçosa; ²Harvard Medical School
(Presented By: Mariana Neves, PhD)

TRANSURETHRAL SEMINAL VESICULOSCOPY USING A 6F VESICULOSCOPE FOR EJACULATORY DUCT OBSTRUCTION: INITIAL EXPERIENCE
Zhiyong Liu, Haifeng Wang, MD and Yinghao Sun, MD
Changhai Hospital
(Presented By: Zhiyong Liu)

INITIAL CHARACTERIZATION OF G PROTEIN-COUPLED RECEPTOR 56 (GPR56) IN MAMMALIAN SPERMATOGENIC CELLS AND SPERM
Kethelyne Beauvais, Amy Northrop, Casey Barber and James Foster, PhD
Randolph-Macon College
(Presented By: Kethelyne Beauvais)

EFFICIENT TRANSFECTION OF DNA INTO PRIMARILY CULTURED RAT SERTOLI CELLS BY ELECTROPORATION
Fuping Li, Yamaguchi Kohei, Okada Keisuke, Matsushita Kei, Enatsu Noritoshi, Chiba Koji and Fujisawa Masato
(Presented By: Fuping Li)
THE ROLE OF PARCIAL AZFC MICRODELETIONS ON THE SEX-RATIO OF CHILDREN BORN TO FERTILE MEN OF JAPANESE ORIGIN IN BRASIL: REGULATION OF SECONDARY SEX-RATIO MAY ALSO BE INFLUENCED BY GENETIC FACTORS
Patricia Pieri, PhD¹,², Sueli Oba-Shinjo, PhD³, Brian Melo, Post-Graduate Student³, Suely Marie, MD, PhD, Professor⁴ and Jorge Hallak, MD, PhD, Medical Assistant⁵,⁶
¹Molecular and Cellular Biology Laboratory, Department of Neurology, University of Sao Paulo Medical School, SP, Brazil; ²Androscience – High Complexity Andrology Laboratory; ³Referral Laboratory for Andrology, Cryopreservation and Men’s Reproductive Health; ⁴Molecular and Cellular Biology Laboratory, Department of Neurology, University of Sao Paulo Medical School; ⁵Reproductive Toxicology Unit – Department of Pathology; ⁶University of Sao Paulo Medical School, Androscience – High Complexity Andrology Laboratory; ⁷Referral Laboratory for Andrology, Cryopreservation and Men’s Reproductive Health, SP-Brazil, Section of Andrology, Division of Urology, Department of Surgery, University of Sao Paulo Medical School
(Presented By: Patricia Pieri, PhD)

GENOMIC DISORDERS ASSOCIATED WITH GENITAL ANOMALIES AND MIDLINE FUSION DEFECTS
Shaye Lewis, PhD¹, Josephine Addai, BS¹, Aysegul Sahin, BS¹, Patience Wildenfels, MD¹, Jill Rosenfeld, PhD² and Dolores Lamb, PhD¹
¹Baylor College of Medicine; ²Signature Genomics Laboratories Perkin Elmer
(Presented By: Shaye Lewis PhD)

OXIDATIVE STRESS AND SPERM DNA DAMAGE: AFFECT ON EARLY EVENTS OF CONCEPTION, INDICES OF EMBRYO GROWTH AND EMBRYO QUALITY IN COUPLES OPTING FOR IVF
Monis Bilal Shamsi, MSc¹ and Rima Dada, MD, PhD²
¹Laboratory for Molecular Reproduction and Genetics, Department of Anatomy, All India Institute of Medical Sciences; ²Laboratory for Molecular Reproduction and Genetics, Department of Anatomy, All India Institute of Medical Sciences, New Delhi, India
(Presented By: Monis Bilal Shamsi, MSc)

INTRACYTOPLASMIC MORPHOLOGICALLY SELECTED SPERM INJECTION OUTCOMES: THE ROLE OF SPERM PREPARATION TECHNIQUES
Jorge Hallak, MD, PhD¹, Amanda Setti, BSc², Rita de Cássia Figueira, MSc³, Livia Vingris, BSc³, Assumpto Iaconelli, Jr., MD⁴ and Edson Borges, Jr., MD, PhD⁴
¹Androscience Center for Male Infertility; ²Instituto Sapientiae – Centro de Estudos e Pesquisa em Reprodução Humana Assistida; ³Fertility – Centro de Fertilização Assistida
(Presented By: Jorge Hallak, MD, PhD)

ANTI-INFLAMMATORY TREATMENT FOR ASTHENOZOOSPERMIA FOLLOWING MICROSURGICAL VASECTOMY REVERSAL
Amy Perkins, MS¹, Matthew Marks, BS¹, Peter Burrows, MD² and Sheldon Marks, MD²
¹Arizona Andrology Laboratory & Cryobank; ²International Center for Vasectomy Reversal
(Presented By: Amy Perkins, MS)

INVESTIGATING THE CYTOTOXIC EFFECTS OF NOVEL COMPOUNDS AS POTENTIAL SPERMICIDES
Charmiane M. Henderson, BS, Elisa B. Busada, Neil T. Sullivan, BS and Jennifer J. Venditti, PhD, MS, BS
Bloomsburg University
(Presented By: Jennifer J. Venditti, PhD, MS, BS)

FUNCTIONAL DISTRIBUTION OF HUMAN SEMEN ALPHA-L-FUCOSIDASE AS A PREDICTOR OF FERTILITY
Neil T. Sullivan, BS and Jennifer J. Venditti, PhD, MS, BS
Bloomsburg University
(Presented By: Neil T. Sullivan, BS)

EFFECTS OF HORMONAL STIMULATION OF TESTICULAR FUNCTION ON SPERM PARAMETERS
Anastasios Sylakos, MD, Panagiotis Georgopoulos, MD, Stavros Gratsias, MD, Evalia Vlachopoulou, BS, Panagiota Tsounapi, BS, Fotios Dimitriadis, MD, PhD, Dimitrios Giannakis, MD, PhD, Georgios Seminis, MD, Athanasios Lazaridis, MD, Achilleas Papageorgiou, MD and Nikolaos Sofikitis, MD, PhD
Ioannina University Department of Urology
(Presented By: Anastasios Sylakos, MD)
INVESTIGATION OF MALE INFERTILITY USING QUANTITATIVE COMPARATIVE PROTEOMICS
Christine Légaré, MSc, Frédéric Fournier, PhD, Arnaud Droit, PhD, Francine Cloutier, BSc, Roland R. Tremblay, MD and Robert Sullivan, PhD
Laval University
(Presented By: Christine Légaré, MSc)

RESTORATION OF FERTILITY IN A STERILE MUTANT MOUSE MODEL BY ELEVATION OF TESTICULAR TEMPERATURE
Paul B. Comish, BS, MPH¹, Lai Yi Liang, BS¹, Yasuhiro Yamauchi, PhD², Connie C. Weng, MD, PhD¹, Gunapala Shetty, PhD¹, Monika A. Ward, PhD² and Marvin Meistrich, PhD¹
¹Univ. Texas MD Anderson Cancer Center, Houston, TX; ²Univ. Hawaii School of Medicine, Honolulu, HI
(Presented By: Marvin Meistrich, PhD)

ADIPOSE TISSUE–DERIVED STEM CELL THERAPY FOR PREVENTION AND TREATMENT OF ERECTILE DYSFUNCTION IN A RAT MODEL OF PEYRONIE’S DISEASE
Ahmet Gokce, MD, Zakaria Abd Elmageed, PhD, George Lasker, Sree Harsha Mandava, MD, MHSA, Landon Trost, MD, Philip Kadowitz, Asim Abel Mageed, PhD, Suresh Sikka, PhD and Wayne Hellstrom, MD, FACS
Tulane University School of Medicine, New Orleans, LA
(Presented By: Ahmet Gokce, MD)

DHEA AND DHEA-S IN NORMAL MALE EJACULATORY FUNCTION
Matthew Wosnitzer, MD, Ali Dabaja, MD, Alexander Bolyakov, MSc, Peter Schlegel, MD and Darius Paduch, MD, PhD
Department of Urology, Weill Cornell Medical College, New York, NY
(Presented By: Matthew Wosnitzer, MD)

THE ROLE OF SEROTONIN, DOPAMINE, EPINEPHRINE, AND NOREPINEPHRINE IN NORMAL MALE EJACULATION
Matthew Wosnitzer, MD, Ali Dabaja, MD, Alexander Bolyakov, MSc and Darius Paduch, MD, PhD
Department of Urology, Weill Cornell Medical College, New York, NY
(Presented By: Matthew Wosnitzer, MD)

THE ROLE OF OXYTOCIN IN NORMAL MALE EJACULATORY FUNCTION
Matthew Wosnitzer, MD, Ali Dabaja, MD, Alexander Bolyakov, MSc and Darius Paduch, MD, PhD
Department of Urology, Weill Cornell Medical College, New York, NY
(Presented By: Matthew Wosnitzer, MD)

DOES INCREASED AGE HAVE NEGATIVE IMPACT ON ORGASM?
Ali Dabaja, MD, Matthew Wosnitzer, MD, Alexander Bolyakov, MSc and Darius Paduch, MD, PhD
Department of Urology, Weill Cornell Medical College, New York, NY
(Presented By: Ali Dabaja, MD)

THE RELATION OF THE CONSTRUCTIVE BAND TO THE PENILE CIRCUMFERENCE
Joon Yong Kim and P.B.M. Kim Mr
Philip and Paul Medical Institute
(Presented By: Joon Yong Kim)

INVESTIGATION OF GALECTIN-3 BINDING LIGANDS IN HUMAN SEMINAL PLASMA USING A PROTEOMIC APPROACH
Matthew Kovak, MS, Sarika Saraswati, PhD and Alan Diekman, PhD
Department of Biochemistry and Molecular Biology College of Medicine University of Arkansas for Medical Sciences
(Presented By: Matthew Kovak, MS)
POSTER SESSION II

PROSTATE / TESTIS CANCER / CLINICAL UROLOGY

Poster# 92  ROLE OF THE ATP-DEPENDENT LON PROTEASE IN PROSTATE CANCER CELL DEATH
Venkatesh Sundararajan, MPharm, PhD and Carolyn Suzuki, PhD
New Jersey Medical School, UMDNJ
(Presented By: Venkatesh Sundararajan, MPharm, PhD)

Poster# 93  DIFFERENTIAL UPREGULATION OF GLYCOLYTIC ENZYMES IS AN UNDERLYING FACTOR IN LEUKOCYTOSPERMIA RESPONDING TO ANTIBIOTIC THERAPY
Sruti Chandra, PhD, Zakaria Abd Elmageed, PhD, Asim Abdel-Mageed, PhD, Wayne Hellstrom, MD, FACS and Suresh Sikka, PhD
Tulane University School of Medicine, New Orleans, LA
(Presented By: Sruti Chandra, PhD)

Poster# 94  A NEW WAY FOR THE TREATMENT OF BLADDER INVASIVE ADENOSQUAMOUS CARCINOMA OF THE PROSTATE: RADICAL CYSTOPROSTATECTOMY
Haifeng Wang, Xu Gao, MD and Yinghao Sun, MD
Changhai Hospital
(Presented By: Haifeng Wang)

SPERM FUNCTION / SEMEN ANALYSIS

Poster# 95  INCREASE OF SPERM DNA FRAGMENTATION WITH AGE IN CLINICAL PATIENTS
Don Evenson, PhD, HCLD, Jennifer Christianson, AAS and Kay Kasperson, BS
SCSA Diagnostics
(Presented By: Don Evenson, PhD, HCLD)

Poster# 96  THE EFFECT OF TYROSINE KINASE INHIBITORS ON MALE REPRODUCTIVE HEALTH AND SPERM FUNCTION
James Smith, MD, MS¹, Olga Syritsyna, PhD², Nam Tran, MD, PhD¹, Mitchell Rosen, MD¹, Liza Jalalian, BS¹ and Polina Lishko, PhD³
¹UCSF; ²UC Berkeley
(Presented By: James Smith, MD, MS)

Poster# 97  THE PROTEOME OF HUMAN SPERM TAIL PROVIDE NEW CLUES TO UNDERSTAND ENDOGENOUS METABOLISM
Alexandra Amaral, PhD¹, Judit Castillo, MSc², Josep Maria Estanyol, PhD³, José Luís Ballescà, MD, PhD⁴, João Ramalho-Santos, PhD⁵ and Rafael Oliva, PhD⁶
¹University of Barcelona; ²University of Barcelona, Spain; ³IDIBAPS, Barcelona, Spain; ⁴Barcelona Clinic Hospital, Spain; ⁵CNC, University of Coimbra, Portugal; ⁶University of Barcelona, IDIAPS and Clinic Hospital, Barcelona, Spain
(Presented By: Alexandra Amaral, PhD)

Poster# 98  EXPRESSION, BIOCHEMICAL AND FUNCTIONAL CHARACTERIZATION OF RECOMBINANT MURINE BINDER OF SPERM PROTEIN HOMOLOG 2 (REC-BSPH2)
Geneviève Plante, BSc and Puttaswamy Manjunath, PhD
University of Montreal
(Presented By: Geneviève Plante, BSc)

Poster# 99  SPECIAL RESEARCH METHODS FOR PROVING AZOOSPERMIA: COMPARISON BETWEEN CYTOSPIN AND ULTRACENTRIFUGATION TECHNIQUE
Rosa Alice Monteiro, BSc¹, JULIANA PARIZ, MSc²³, PATRICIA PIERI, PhD²⁴⁵ and Jorge Hallak, MD, PhD, Medical Assistant⁶,⁷,⁸
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(Presented By: Patricia Pieri, PhD)
ENHANCEMENT OF SPERM IDENTIFICATION BY OBSERVATION OF RESUSPENDED PELLETS IN MICRO DROPS SUPPLEMENTED WITH PENTOXYFILLINE: ASSESSMENT OF SPECIMENS PREVIOUSLY CLASSIFIED AS AZOOSPERMIC (NON-OBSTRUCTIVE)
Juan Correa-Perez, PhD¹, Samuel Marynick, MD¹ and Pedro Beauchamp, MD²
¹Texas Center for Reproductive Health; ²Puerto Rico Fertility Center
(Presented By: Juan Correa-Perez, PhD)

THE STUDY ON THE CARNITINE CONCENTRATION IN THE SEMEN PLASMA OF THE NORMAL SPERM MOTILITY AND ASTHENOZOOSPERMIA IVF-ET MALE POPULATION ACCORDING TO THE NEW 5TH WHO MANUAL SEMEN PARAMETER REFERENCE VALUES
Pei-Yan Liang, PhD, Jing Cai, Bachelor, Hongjie Liu, Yong Zeng, Bachelor and Jin-Ming Liang, Bachelor
ART Center, Shenzhen Zhongshan Urology Hospital
(Presented By: Hongjie Liu)

RELATIONSHIP BETWEEN THE TOTAL NORMAL FORMS AND PROGRESSIVE MOTILITY SPERM NUMBER (TNPS) AND THE OUTCOME OF IN VITRO FERTILIZATION (IVF)
Jing Cai, Bachelor¹, Biao Yin, Master¹, Hongjie Liu, Master, Ming Zhao, Bachelor², Qi Lin, Bachelor¹, Tonghua Wu, Bachelor², Xiaodong Hu, Bachelor³ and Yong Zeng, Bachelor⁴
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(Presented By: Hongjie Liu, Master)

PRECONCEPTION SEMEN QUALITY AND TIME-TO-PREGNANCY, LIFE STUDY
Steven Schrader¹, Rajeswhari Sundaram², Enrique Schisterman², Anne Sweeney³, Zhen Chen², Sungduk Kim², José Maisog², Terry Turner¹, Michael Breitenstein¹ and Germaine Buck Louis²
¹CDC/NIOSH; ²NIH/NICHD; ³Texas A&M
(Presented By: Steven Schrader)

LATE REPRODUCTIVE ANALYSIS OF MALE RAT OFFSPRING EXPOSED TO NICOTINE DURING PREGNANCY AND LACTATION
Mayra Miranda Rodrigues, Master’s Student, Camila Cicconi Paccola, Collaborator, Samara Urban, Collaborator and Sandra Maria Miraglia, Advisor
Federal University of São Paulo – UNIFESP – São Paulo/Brazil
(Presented By: Mayra Miranda Rodrigues, Master’s Student)

THE EFFECTS OF ANTIOXIDANTS ADMINISTRATION IN THE UNILATERALLY CRYPTORCHIDIZED RAT MODEL
Panagiota Tsounapi, BS¹, Motoaki Saito, MD, PhD², Nikolaos Sofikitis, MD, PhD, DMSci³, Fotios Dimitriadis, MD, PhD, FEBU³, Shogo Shimizu, MS², Tadahiro Isoyama, MD, PhD³, Takehiro Sejima, MD, PhD³, Shuhei Tomita, MD, PhD⁴ and Atsushi Takenaka, MD, PhD⁴
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(Presented By: Panagiota Tsounapi BS)

ROLE OF WSX-1 IN THE CYTOPROTECTIVE ACTION OF THE MITOCHONDRIAL PEPTIDE, HUMANIN, ON MALE GERM CELLS
Yue Jia, MD, PhD¹, Yan-He Lue, MD², Prasanth Surampudi, MD³, Peter Liu, MD, PhD⁴, Ronald S. Swerdloff, MD⁴, Kuk-Wha Lee, MD, PhD⁴, Pinchas Cohen, MD⁴ and Christina Wang, MD⁴
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(Presented By: Yue Jia, MD, PhD)
IDENTIFICATION OF A NOVEL TESTICULAR MESENCHYMAL STEM CELL POPULATION REQUIRED FOR THE EXPANSION OF HUMAN SPERMATOGONIAL STEM CELLS
Pamela Yango, BS¹, James F. Smith, MD, MS¹, Eran Altman, MD¹, Andrea Poelzl, MA¹, Polina V. Lishko, PhD² and Nam D. Tran, MD, PhD¹
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(Presented By: Pamela Yango, BS)

THE CYTOPROTECTIVE EFFECT OF HUMANIN IN MALE GERM CELLS IS INDEPENDENT OF TESTOSTERONE SYNTHESIS
Prasanth Surampudi, MD, Yan-He Lue, MD, Yue Jia, MD, PhD, Vince Atienza, BS, Peter Liu, MD, PhD, Ronald Swerdloff, MD and Christina Wang, MD
Harbor UCLA/LaBioMed
(Presented By: Prasanth Surampudi, MD)
# INDEX OF ABSTRACT AUTHORS

A

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abd Elmageed, Z.</td>
<td>42, 85, 43, 93</td>
</tr>
<tr>
<td>Abdel Mageed, A.</td>
<td>85, 15</td>
</tr>
<tr>
<td>Abdel-Mageed, A.</td>
<td>93</td>
</tr>
<tr>
<td>Abud, H.</td>
<td>10</td>
</tr>
<tr>
<td>Addai, J.</td>
<td>9, 76</td>
</tr>
<tr>
<td>Aitken, J.</td>
<td>23</td>
</tr>
<tr>
<td>Aitken, R.</td>
<td>12</td>
</tr>
<tr>
<td>Almont, T.</td>
<td>32</td>
</tr>
<tr>
<td>Altman, E.</td>
<td>106</td>
</tr>
<tr>
<td>Alvau, A.</td>
<td>24</td>
</tr>
<tr>
<td>Amaral, A.</td>
<td>97</td>
</tr>
<tr>
<td>Anbazhagan, K.</td>
<td>15</td>
</tr>
<tr>
<td>Anderson, L.</td>
<td>66</td>
</tr>
<tr>
<td>Araujo, A.</td>
<td>2</td>
</tr>
<tr>
<td>Aston, K.</td>
<td>49</td>
</tr>
<tr>
<td>Atienza, V.</td>
<td>107</td>
</tr>
<tr>
<td>Avellar, M.</td>
<td>16</td>
</tr>
</tbody>
</table>

B

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bader, G.</td>
<td>22</td>
</tr>
<tr>
<td>Baker, M.</td>
<td>23</td>
</tr>
<tr>
<td>Baldi, E.</td>
<td>51, 52</td>
</tr>
<tr>
<td>Ballescà, J.</td>
<td>97</td>
</tr>
<tr>
<td>Baltogiannis, D.</td>
<td>4, 30, 34</td>
</tr>
<tr>
<td>Bapat, B.</td>
<td>22</td>
</tr>
<tr>
<td>Barber, C.</td>
<td>73</td>
</tr>
<tr>
<td>Beauchamp, P.</td>
<td>100</td>
</tr>
<tr>
<td>Beauvais, K.</td>
<td>73</td>
</tr>
<tr>
<td>Beltrame, F.</td>
<td>25</td>
</tr>
<tr>
<td>Bertolla, R.</td>
<td>16</td>
</tr>
<tr>
<td>Bidot, W.</td>
<td>21</td>
</tr>
<tr>
<td>Bodner, F.</td>
<td>54</td>
</tr>
<tr>
<td>Boekelheide, K.</td>
<td>66</td>
</tr>
<tr>
<td>Boissonneault, G.</td>
<td>27</td>
</tr>
<tr>
<td>Bolyakov, A.</td>
<td>33, 86, 87, 88, 89</td>
</tr>
<tr>
<td>Boonjindaisup, A.</td>
<td>6</td>
</tr>
<tr>
<td>Borges Jr., E.</td>
<td>78</td>
</tr>
<tr>
<td>Braden, T.</td>
<td>21</td>
</tr>
<tr>
<td>Breitenstein, M.</td>
<td>102.5</td>
</tr>
<tr>
<td>Breton, S.</td>
<td>71</td>
</tr>
<tr>
<td>Brousseau, C.</td>
<td>65</td>
</tr>
<tr>
<td>Burnazyan, R.</td>
<td>28</td>
</tr>
<tr>
<td>Burrows, P.</td>
<td>79</td>
</tr>
<tr>
<td>Busada, E.</td>
<td>80</td>
</tr>
</tbody>
</table>

C

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabral, R.</td>
<td>20</td>
</tr>
<tr>
<td>Cai, J.</td>
<td>101, 102</td>
</tr>
<tr>
<td>Cambi, M.</td>
<td>51, 52</td>
</tr>
</tbody>
</table>

D

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dahaja, A.</td>
<td>86, 87, 88, 89</td>
</tr>
<tr>
<td>Dada, R.</td>
<td>36, 77</td>
</tr>
<tr>
<td>Daligkaros, G.</td>
<td>34</td>
</tr>
<tr>
<td>Daphnis, D.</td>
<td>4, 34</td>
</tr>
<tr>
<td>DB, K.</td>
<td>53</td>
</tr>
<tr>
<td>de Pizzol Jr., J.</td>
<td>25</td>
</tr>
<tr>
<td>Debruyne, F.</td>
<td>2</td>
</tr>
<tr>
<td>Dere, E.</td>
<td>66</td>
</tr>
<tr>
<td>Dhole, B.</td>
<td>57</td>
</tr>
<tr>
<td>Di Segni, C.</td>
<td>64</td>
</tr>
<tr>
<td>Dimitriadi, F.</td>
<td>82, 104</td>
</tr>
<tr>
<td>Dobs, A.</td>
<td>2</td>
</tr>
<tr>
<td>Dolezalova, D.</td>
<td>41</td>
</tr>
<tr>
<td>Droit, A.</td>
<td>83</td>
</tr>
<tr>
<td>Durtschi, D.</td>
<td>49</td>
</tr>
</tbody>
</table>

E

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ek, B.</td>
<td>44</td>
</tr>
<tr>
<td>Elumai, P.</td>
<td>40</td>
</tr>
<tr>
<td>Elumalai, P.</td>
<td>15</td>
</tr>
<tr>
<td>Emery, B.</td>
<td>49</td>
</tr>
<tr>
<td>Estanyol, J.</td>
<td>97</td>
</tr>
<tr>
<td>Evenson, D.</td>
<td>95</td>
</tr>
</tbody>
</table>
### INDEX OF ABSTRACT AUTHORS

#### F
- Farzadi, L. 31
- Ferrette, A. 69, 70
- Festa, R. 64
- Figueira, R. 78
- Fontenot, G. 14
- Forti, G. 51, 52
- Foster, J. 73
- Fournier, F. 83

#### G
- Gao, X. 94
- Ge, R. 61, 62
- Ge, S. 49
- Georgiou, I. 30
- Georgopoulos, P. 82
- Giakoumakis, I. 4, 34
- Giannakis, D. 30, 34, 82
- Gilbert, B. 47
- Gokce, A. 42, 85, 6, 43
- Goldenberg, E. 47
- Goyal, H. 21
- Gratsias, S. 30, 34, 82
- Grégoire, M. 27
- Guo, J. 61, 62

#### H
- Hagan, S. 15
- Haider, A. 13, 46
- Hales, B. 3
- Hall, S. 66
- Hallak, J. 78, 75, 99, 69, 70
- Hanus, T. 41
- Hartigan, S. 47
- Hartzler, A. 39
- Hasan, T. 36
- Hellström, W. 42, 85, 6, 43, 93
- Henderson, C. 80
- Herlea-Pana, O. 24
- Hill, E. 71
- Hillelsohn, J. 47
- Hinton, B. 7
- Honda, M. 104
- Horvay, K. 10
- Hossain, A. 50
- Hotaling, J. 39
- Hou, H. 22
- Hoyos, C. 1
- Hsi, R. 39
- Hu, X. 102
- Huber, E. 54

#### I
- Iaconelli Jr., A. 78
- Iijima, M. 63
- Imhof, M. 54
- Isoyama, T. 104
- Itman, C. 68

#### J
- Jack, J. 7
- Jalalalian, L. 96
- Jamsai, D. 35
- Jarvi, K. 22
- Jenkins, T. 49
- Jia, Y. 11, 105, 107
- Jorgez, C. 8

#### K
- Kadovitz, P. 42, 85, 43
- Kamieniczna, M. 55
- Kasper, K. 95
- Keenan, D. 1
- Kei, M. 74
- Keisuke, O. 74
- Kempinas, W. 16
- Kerr, G. 10
- Khaki, A. 18, 31, 31
- Kichine, E. 3
- Kim, J. 90, 38
- Kim, P. 90, 38
- Kim, S. 102.5
- Koh, E. 63
- Kohei, Y. 74
- Koji, C. 74
- Koshimizu, J. 25
- Koukos, S. 34
- Kovak, M. 91
- Kumar, A. 57
- Kumar, D. 36
- Kurpisz, M. 55

#### L
- Lakshmanan, G. 40
- Lamb, D. 8, 9, 76
- Larsson, A. 44
- Lasker, G. 42, 85, 43
- Lazaridis, A. 30, 34, 82
- Lazaros, L. 30
- Lee, K. 11, 105
- Légaret, C. 83
- Lewis, S. 9, 76
- Li, F. 74
- Lian, Q. 61, 62
- Liang, J. 101
# INDEX OF ABSTRACT AUTHORS

<table>
<thead>
<tr>
<th>Author</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liang, L.</td>
<td>84</td>
</tr>
<tr>
<td>Liang, P.</td>
<td>101</td>
</tr>
<tr>
<td>Lim, S.</td>
<td>35</td>
</tr>
<tr>
<td>Lin, C.</td>
<td>59</td>
</tr>
<tr>
<td>Lin, Q.</td>
<td>102</td>
</tr>
<tr>
<td>Lin, Y.</td>
<td>59</td>
</tr>
<tr>
<td>Lipovac, M.</td>
<td>54</td>
</tr>
<tr>
<td>Lipshultz, L.</td>
<td>8</td>
</tr>
<tr>
<td>Lishko, P.</td>
<td>96, 106</td>
</tr>
<tr>
<td>Littarru, G.</td>
<td>64</td>
</tr>
<tr>
<td>Liu, H.</td>
<td>101, 102</td>
</tr>
<tr>
<td>Liu, L.</td>
<td>49</td>
</tr>
<tr>
<td>Liu, P.</td>
<td>1, 11, 105, 107</td>
</tr>
<tr>
<td>Liu, Z.</td>
<td>72</td>
</tr>
<tr>
<td>Lo, K.</td>
<td>22</td>
</tr>
<tr>
<td>Lock, M.</td>
<td>37</td>
</tr>
<tr>
<td>Louis, G.</td>
<td>102.5</td>
</tr>
<tr>
<td>Loveland, K.</td>
<td>10, 68</td>
</tr>
<tr>
<td>Lu, C.</td>
<td>59</td>
</tr>
<tr>
<td>Lu, X.</td>
<td>7</td>
</tr>
<tr>
<td>Lue, Y.</td>
<td>11, 105, 107</td>
</tr>
<tr>
<td>Macek, P.</td>
<td>41</td>
</tr>
<tr>
<td>Maisog, J.</td>
<td>102.5</td>
</tr>
<tr>
<td>Mancini, A.</td>
<td>64</td>
</tr>
<tr>
<td>Mandava, S.</td>
<td>42, 85, 43</td>
</tr>
<tr>
<td>Manjunath, P.</td>
<td>98</td>
</tr>
<tr>
<td>Marchiani, S.</td>
<td>51, 52</td>
</tr>
<tr>
<td>Maria Miraglia, S.</td>
<td>103</td>
</tr>
<tr>
<td>Marie, S.</td>
<td>75</td>
</tr>
<tr>
<td>Marino, F.</td>
<td>35</td>
</tr>
<tr>
<td>Marks, M.</td>
<td>79</td>
</tr>
<tr>
<td>Marks, S.</td>
<td>79</td>
</tr>
<tr>
<td>Martinez-Arguelles, D.</td>
<td>48</td>
</tr>
<tr>
<td>Marynick, S.</td>
<td>100</td>
</tr>
<tr>
<td>Masato, F.</td>
<td>74</td>
</tr>
<tr>
<td>Massonneau, J.</td>
<td>27</td>
</tr>
<tr>
<td>McKerfie, C.</td>
<td>22</td>
</tr>
<tr>
<td>Mehta, A.</td>
<td>29, 33</td>
</tr>
<tr>
<td>Meistrich, M.</td>
<td>84</td>
</tr>
<tr>
<td>Melo, B.</td>
<td>75</td>
</tr>
<tr>
<td>Mendoza, R.</td>
<td>65</td>
</tr>
<tr>
<td>Menezes, T.</td>
<td>71</td>
</tr>
<tr>
<td>Meyer, T.</td>
<td>49</td>
</tr>
<tr>
<td>Midzak, A.</td>
<td>17</td>
</tr>
<tr>
<td>Mielenik, A.</td>
<td>29</td>
</tr>
<tr>
<td>Mieusset, r.</td>
<td>32</td>
</tr>
<tr>
<td>Miraglia, S.</td>
<td>19, 20</td>
</tr>
<tr>
<td>Miranda Rodrigues, M.</td>
<td>103</td>
</tr>
<tr>
<td>Mohanraj, A.</td>
<td>40</td>
</tr>
<tr>
<td>Mohanraj, K.</td>
<td>40</td>
</tr>
<tr>
<td>Monteiro, R.</td>
<td>99</td>
</tr>
<tr>
<td>Moody, S.</td>
<td>68</td>
</tr>
<tr>
<td>Moore, K.</td>
<td>24, 26</td>
</tr>
</tbody>
</table>

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Andrology, 2013, 1 (Suppl. 2), 53
### INDEX OF ABSTRACT AUTHORS

**R**

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raimondo, S.</td>
<td>64</td>
</tr>
<tr>
<td>Rajpert-DeMeyts, E.</td>
<td>10</td>
</tr>
<tr>
<td>Ramalho-Santos, J.</td>
<td>97</td>
</tr>
<tr>
<td>Rani, L.</td>
<td>57</td>
</tr>
<tr>
<td>Raimondo, S.</td>
<td>64</td>
</tr>
<tr>
<td>Rajpert-DeMeyts, E.</td>
<td>10</td>
</tr>
<tr>
<td>Ramalho-Santos, J.</td>
<td>97</td>
</tr>
<tr>
<td>Rani, L.</td>
<td>57</td>
</tr>
<tr>
<td>Ranjan, M.</td>
<td>15</td>
</tr>
<tr>
<td>Restelli, A.</td>
<td>16</td>
</tr>
<tr>
<td>Ricci, B.</td>
<td>51</td>
</tr>
<tr>
<td>Robaire, B.</td>
<td>3</td>
</tr>
<tr>
<td>Roehrborn, C.</td>
<td>2</td>
</tr>
<tr>
<td>Ronquist, G.</td>
<td>44, 44</td>
</tr>
<tr>
<td>Roosma, J.</td>
<td>33</td>
</tr>
<tr>
<td>Rosen, M.</td>
<td>96</td>
</tr>
<tr>
<td>Rosen, R.</td>
<td>2</td>
</tr>
<tr>
<td>Rosenfeld, J.</td>
<td>8, 9, 76</td>
</tr>
</tbody>
</table>

**S**

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>S, P.</td>
<td>53</td>
</tr>
<tr>
<td>Saad, F.</td>
<td>13, 46</td>
</tr>
<tr>
<td>Sahin, A.</td>
<td>8, 9, 76</td>
</tr>
<tr>
<td>Saito, M.</td>
<td>104</td>
</tr>
<tr>
<td>Sakai, M.</td>
<td>48</td>
</tr>
<tr>
<td>Salamonson, L.</td>
<td>12</td>
</tr>
<tr>
<td>Salicioni, A.</td>
<td>24</td>
</tr>
<tr>
<td>Samantham, S.</td>
<td>58</td>
</tr>
<tr>
<td>Samplaski, M.</td>
<td>22</td>
</tr>
<tr>
<td>Saraswati, S.</td>
<td>91</td>
</tr>
<tr>
<td>Sargsyan, T.</td>
<td>28</td>
</tr>
<tr>
<td>Sasso-Cerri, E.</td>
<td>25</td>
</tr>
<tr>
<td>Schisterman, E.</td>
<td>102.5</td>
</tr>
<tr>
<td>Schlegel, P.</td>
<td>29, 33, 86</td>
</tr>
<tr>
<td>Schrader, S.</td>
<td>102.5</td>
</tr>
<tr>
<td>Schroder, F.</td>
<td>2</td>
</tr>
<tr>
<td>Schütz, A.</td>
<td>54</td>
</tr>
<tr>
<td>Sejima, T.</td>
<td>104</td>
</tr>
<tr>
<td>Sekar, S.</td>
<td>40</td>
</tr>
<tr>
<td>Semini, G.</td>
<td>34</td>
</tr>
<tr>
<td>Seminis, G.</td>
<td>82</td>
</tr>
<tr>
<td>Seppan, P.</td>
<td>40</td>
</tr>
<tr>
<td>Setti, A.</td>
<td>78</td>
</tr>
<tr>
<td>Shamsi, M.</td>
<td>36, 77</td>
</tr>
<tr>
<td>Shetty, G.</td>
<td>84</td>
</tr>
<tr>
<td>Shimizu, S.</td>
<td>104</td>
</tr>
<tr>
<td>Shokri, S.</td>
<td>12</td>
</tr>
<tr>
<td>Sideris, P.</td>
<td>4</td>
</tr>
<tr>
<td>Siew, S.</td>
<td>45</td>
</tr>
<tr>
<td>Sikka, S.</td>
<td>42, 85, 43, 93, 15</td>
</tr>
<tr>
<td>Silva, E.</td>
<td>16</td>
</tr>
<tr>
<td>Simard, O.</td>
<td>27</td>
</tr>
<tr>
<td>Simon, L.</td>
<td>49, 21</td>
</tr>
<tr>
<td>Singh, D.</td>
<td>53</td>
</tr>
<tr>
<td>Sisinthy, S.</td>
<td>53</td>
</tr>
<tr>
<td>Siva, A.</td>
<td>53</td>
</tr>
</tbody>
</table>

**T**

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takenaka, A.</td>
<td>104</td>
</tr>
<tr>
<td>Tamburrelli, F.</td>
<td>64</td>
</tr>
<tr>
<td>Tamburino, L.</td>
<td>51, 52</td>
</tr>
<tr>
<td>Taya, M.</td>
<td>63</td>
</tr>
<tr>
<td>Tian, H.</td>
<td>60</td>
</tr>
<tr>
<td>Tiano, L.</td>
<td>64</td>
</tr>
<tr>
<td>Tomita, S.</td>
<td>104</td>
</tr>
<tr>
<td>Tran, N.</td>
<td>96, 106</td>
</tr>
<tr>
<td>Tremblay, J.</td>
<td>65</td>
</tr>
<tr>
<td>Tremblay, R.</td>
<td>83</td>
</tr>
<tr>
<td>Trost, L.</td>
<td>42, 85, 6, 43</td>
</tr>
<tr>
<td>Tsampalas, S.</td>
<td>34</td>
</tr>
<tr>
<td>Tsounapi, P.</td>
<td>82, 104</td>
</tr>
<tr>
<td>Turner, T.</td>
<td>102.5</td>
</tr>
</tbody>
</table>

**U**

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ulcova-Gallova, Z.</td>
<td>55</td>
</tr>
<tr>
<td>Urban, S.</td>
<td>103</td>
</tr>
</tbody>
</table>

**V**

<table>
<thead>
<tr>
<th>Author</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valova, Z.</td>
<td>41</td>
</tr>
<tr>
<td>Vangapandu, V.</td>
<td>8</td>
</tr>
<tr>
<td>Vartholomatos, G.</td>
<td>30</td>
</tr>
<tr>
<td>Veenboer, P.</td>
<td>37</td>
</tr>
<tr>
<td>Veldhuis, J.</td>
<td>1</td>
</tr>
<tr>
<td>Venditti, J.</td>
<td>80, 81</td>
</tr>
<tr>
<td>Vendramini, V.</td>
<td>20, 16</td>
</tr>
<tr>
<td>Venugopal, R.</td>
<td>67</td>
</tr>
</tbody>
</table>
INDEX OF ABSTRACT AUTHORS

Vingris, L. 78
Viswanadhapalli, S. 67
Vlachopoulou, E. 4, 30, 34, 82
Voboril, V. 41

W
Walschaerts, M. 32
Walsh, T. 39
Wang, C. 61, 11, 105, 107
Wang, G. 61
Wang, H. 94, 72
Ward, M. 84
Washington, A. 7
Weng, C. 84
Westmuckett, A. 24, 26
Whiting, S. 12
Wiehle, R. 14
Wildenfels, P. 9, 76
Williams, M. 7
Wosnitzer, M. 86, 87, 88, 89
Wu, F. 2
Wu, T. 102

X
Xu, B. 7
Xu, Y. 61

Y
Yamauchi, Y. 84
Yang, L. 7
Yango, P. 106
Yassin, A. 13, 46
Yin, B. 102
Young, J. 10
Yuan, K. 62

Z
Zamecnik, L. 41
Zeng, Y. 101, 102
Zhang, Y. 62
Zhao, M. 102
Zhao, M. 102
Zhou, H. 61
Zhu, Y. 22
Zirkin, B. 17
Zitzmann, M. 13, 46
Zitzmann, M. 13, 46
Zitos, K. 34
THE EFFECT OF CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) ON THE HYPOTHALAMO-PITUITARY-GONADAL AXIS IS MODIFIED BY AGE IN MEN WITH OBSTRUCTIVE SLEEP APNEA (OSA): A RANDOMISED SHAM-CONTROLLED 12 WEEK STUDY

Camilla Hoyos, BAppSc (Hons), MPH, PhD¹, Daniel Keenan², Johannes Veldhuis³ and Peter Liu, MBBS (Hons), PhD⁴

¹NHMRC Centre for Integrated Research and Understanding of Sleep (CIRUS), Woolcock Institute of Medical Research, and University of Sydney; ²Department of Statistics, University of Virginia; ³Department of Medicine, Endocrine Research Unit, Mayo School of Graduate Medical Education, Clinical Translational Science Centre, Mayo Clinic; ⁴Division of Endocrinology, Department of Medicine, David Geffen School of Medicine at UCLA, Harbor-UCLA Medical Centre and Los Angeles Biomedical Research Institute

Introduction: OSA is a common condition characterised by intermittent hypoxia, which disrupts sleep and gonadal function. The effect of OSA and CPAP on frequently sampled nocturnal luteinizing hormone (LH) and testosterone (T) secretion has not been studied in a randomised sham-controlled study.

Methods: 18 CPAP naive men with moderate to severe OSA (age=49±12y, apnea hypopnea index (AHI)=40±18 events/h, BMI=31±5 kg/m²) were randomised in a 12-week double blind sham-controlled parallel group study, to receive either active (n=11) or sham (n=7) CPAP. At week 12 LH and T was measured every 10 min from 10PM until 6AM (49 samples) while sleep architecture was simultaneously assessed. LH and T secretion were determined by mathematical deconvolution. Data are mean±SD.

Results: CPAP reversed OSA by 33 events/h compared with sham (p<0.0001), as expected. Total (35.4±10.2 versus 26.4±6.4 IU/L, p=0.03) and basal (18.1±5.5 vs 13.3±3.6 IU/L, p=0.04) LH secretion were significantly higher in active compared to sham CPAP users, respectively. Pulsatile LH secretion (p=0.20), mass of LH secreted per pulse (p=0.22), pulse frequency (p=0.83), LH regularity (p=0.19) and mean LH concentration (p=0.075) were not different between groups. Age modified the effect of CPAP on basal secretion (interaction term p=0.03), pulse frequency (p=0.002), average mass per pulse (p=0.04) and LH regularity (p=0.004). T secretory parameters were all increased by about 20%, but not significantly.

Conclusion: Twelve weeks of CPAP increases basal, and hence total, LH secretion, and alters LH pulse frequency and regularity in an age-dependent fashion. The mechanistic bases for this age interaction are not known.

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ABSTRACTS

Sunday, April 14, 2013
2:00 p.m. - 3:30 p.m.

Concurrent Oral Session I
New Insights in Clinical Andrology
Location: Coronado Ballroom
Session Chairs:
Leslie Lynn Heckert, PhD
Elizabeth Snyder, PhD

ASSOCIATION BETWEEN ENDOGENOUS TESTOSTERONE (T), PROSTATE SYMPTOMS, AND PROSTATE-SPECIFIC ANTIGEN (PSA) LEVELS IN HYPOGONADAL MEN

Andre Araujo, PhD¹, Teresa Curto, MSW, MPH¹, Frans Debruyne, MD, PhD¹, Adrian Dobs, MD, MHS¹, Claus Roehrborn, MD¹, Fritz Schroder, MD², Frederick Wu, MB, ChB, MD, FRCP³ and Raymond Rosen, PhD⁴

¹New England Research Institutes, Inc.; ²Andros Men’s Health Institutes; ³Jons Hopkins University; ⁴UT Southwestern Medical Center; ⁵Erasmus Medical Center; ⁶Central Manchester University Hospitals NHS Foundation Trust

(Presented By: Andre Araujo, PhD)

Introduction: Hypogonadism (HG) and lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH) are common in the aging male. While T is required for normal development and function of the male urogenital tract and prostate, epidemiologic data are in conflict regarding the association between T and LUTS/BPH. Our objective was to examine the relations between endogenous T, LUTS/BPH, and PSA in a registry of men with HG.

Methods: RHYME is a multi-center registry of 999 men with clinically-diagnosed HG (naive to androgen treatment) from 25 sites in 6 EU countries (DE/ES/IT/NL/SE/UK). Overall LUTS and voiding and storage symptoms were assessed by the American Urological Association Symptom Index. Clinical BPH, BPH medication use [5-alpha-reductase inhibitors (5ARIs) and alpha-blockers (AB)] were assessed via medical record. PSA (immunometric assay) and T (mass spectrometry) were measured centrally. Differences in geometric mean T in relation to LUTS, clinical BPH, and PSA were assessed via multivariable linear regression models controlling for age, BMI, HG duration, smoking, exercise, self-rated health, number of comorbidities, blood draw time, country, and 5ARI/AB use.

Results: Mean age, T and PSA were 59y, 9.5±1.6nmol/L, and 0.73±2.8ng/mL. Prevalence of clinical BPH was 18.0%, LUTS 40.0%, with 8.8% reporting severe LUTS, 31.6% voiding LUTS, and 49.3% storage symptoms. Mean age LUTS were not associated with T. Clinical BPH was not associated (p<.001) with higher T in a multivariable model. In contrast, higher PSA was associated (p<.001) higher in men with (0.87ng/mL) vs. without (0.67ng/mL) LUTS, with similar findings for voiding/storage LUTS. In unadjusted or adjusted models, overall, voiding, and storage LUTS, clinical BPH and PSA significantly increased with age (all p<.001), whereas T was not associated with age (p=.06). Mean PSA was significantly (p<.001) higher in men with (0.87ng/mL) vs. without (0.67ng/mL) LUTS, with similar findings for voiding/storage LUTS. In unadjusted or adjusted models, overall, voiding, and storage LUTS were not associated with T. Clinical BPH was not associated with T once confounders were controlled. In contrast, higher PSA was associated (p<.001) with higher T in a multivariable model.

Conclusion: Prevalence of LUTS, clinical BPH and PSA elevation (≥1.5ng/mL) are relatively high in hypogonadal men. Differences in endogenous T among these men is not related to patient-reported prostate symptoms or clinical BPH, while PSA is strongly and consistently associated with endogenous T. Future analyses from RHYME will be critical to understanding the impact of T therapy prostate symptoms in hypogonadal men.

Funding: Funded by Bayer Pharma AG.
Introduction and Objectives: The fertilization ability of spermatozoa depends on many biological processes, including the ability to undergo the acrosome reaction and capacitation. Since spermatozoa are transcriptionally silent, these processes depend on the post-translational modification of proteins and surface remodeling events that modify the sperm head surface architecture. The objective of this study was to use a proteomic approach to compare the sperm head protein profile of fertile and infertile men with idiopathic infertility (n=6/group) to identify potential biomarkers for male fertility.

Methods: Three sperm samples obtained at three different time points, at 6 – 8 weeks apart, were provided by each subject for a total of 36 samples from the 12 men. Proteomic analysis of the sperm head fraction resulted in detection of 567 proteins. After the application of a cut-off, established by technical triplicate analysis for consistency of each sample, 124 proteins remained. The expression levels of the detected proteins were compared between groups using spectral counting methods.

Results: Interestingly, the expression of several families of proteins was decreased in the infertile men; these included proteasome subunits such as proteasome subunit alpha type-7 (3.7 fold), acrosome proteins such as acrosome binding protein (4.7 fold), elongation factors, and calcium transduction proteins. Most strikingly, the expression of five members of the chaperonin containing TCP-1 complex was markedly decreased; this included TCP-1 subunit gamma CCT3 (4.7 fold).

Conclusion: To our knowledge, this is the first study that links the de-recreased expression of TCP-1 complex subunits with infertility in men. These findings give new insight into proteins that may regulate human fertility and identify potential protein targets for use in enriching spermatozoa that have greater fertilizing potential in samples from infertile men before IVF/ICSI cycles.

Funding: Supported by the Canadian Institutes of Health Research.

Introduction: We evaluated the influence of semen quality on the outcome of a surrogate motherhood program (SMP).

Methods: Thirty two couples (group A) with normal semen parameters (i.e., sperm concentration, % motile sperms, and % morphologically normal sperms) of semen analysis participated in our SMP. Another group of 28 couples (group B) with an abnormal value in at least one semen parameter was also included in this SMP-study. All female partners underwent ovarian stimulation and semen samples were collected from the male partners. These women asked to participate in our SMP because of a history of hysterectomy or the presence of malignant hypertension, sickle cell anemia, chronic renal failure or liver insufficiency (among others). ICSI techniques were performed in all mature oocytes of each couple of groups A and B. Every surrogate woman underwent transfer of two embryos generated from each couple of groups A or B. Thus 32 surrogate women received embryos from the group A and 28 surrogate women received embryos from the group B. In addition, 31 couples (group C) with normal semen parameters participated in our SMP-study asking additionally for donor oocytes. Another group of 26 couples (group D) with an abnormal value in at least one parameter of semen analysis was also included in this SMP-study asking additionally for donor oocytes.

Results: The % fertilized oocytes (at 18 hours post–ICSI), the % cleaved oocytes (at 36 hours post-ICSI), and the % 8 – 12-cell stage embryos (at 72 hours post-ICSI) were significantly lower (P<0.05; Chi square test) in group B than in group A and in group D than in group C. The proportion of [the pregnant surrogate women] to [the total number of the surrogate women who underwent embryo transfer] was significantly lower in group B (8/28) than in group A (14/32) (P<0.05; Chi square test) and in group D (8/26) than in group C (14/31).

Conclusion: Couples requesting to participate in an SMP with at least one abnormal semen parameter have worse prognosis to achieve pregnancy suggesting that paternal factors affect detrimentally the outcome of SMP. Paternal factors affecting the last events of the fertilization process (such as oocyte activating factor, reproducing element of the centrosome, among others) and early embryonic development or embryonic capacity for implantation (i.e. paternal DNA fragmentation, sperm nuclear proteins, paternal chromosomal aberrations, among others) may be the connective links between decreased semen quality and less optimal outcome in an SMP.
SPERM SUPPRESSION AND CONTRACEPTIVE PROTECTION PROVIDED BY NORETHISTERONE ENANTATE (NET-EN) COMBINED WITH TESTOSTERONE UNDECANOATE (TU) IN HEALTHY MEN
Doug Colvard, PhD
CONRAD, Eastern Virginia Medical School
(Presented By: Doug Colvard, PhD)

Introduction and Objectives: This Phase II study was designed to evaluate whether the combination of a long-acting progestin, norethisterone enantate (NET-EN), and a long-acting androgen, testosterone undecanoate (TU), represents a safe, effective, reversible, and acceptable regimen for male fertility regulation. The trial is a collaboration between CONRAD, WHO and investigators at 10 sites in 7 countries. The primary objectives were to determine the rate of suppression of spermatogenesis and level of contraceptive protection provided by the two injection regimen. Secondary objectives being evaluated include maintenance of suppression, reversibility of the regimen, effects on hormone levels, safety, and acceptability of the method to the study participants and their partners.

Methods: Participants were enrolled between July 2008 and September 2010 and received IM injections of 1000 mg TU and 200 mg NET-EN every 2 months during the Suppression Phase (up to 26 weeks) and Contraceptive Efficacy Phase (up to 56 weeks). Men were transitioned from Suppression to Efficacy once sperm concentrations reached ≤1M/ml. A central laboratory is performing hormone analyses.

Results: The study was designed to enroll 400 couples with at least 227 couples completing Efficacy. 321 couples were enrolled; 260 entered Efficacy and 111 were able to complete all phases of the trial, in part due to the early termination of the study injections. Interim data indicated that the regimen suppressed sperm production effectively, in that only 6 of the 61 discontinuations during Suppression were due to failure to suppress. The nature of the side effects were not unexpected and did not occur uniformly across all sites; however, a higher than expected rate of side effects began to occur, particularly related to mood changes, pain at the injection site and increased libido, some of which were more severe than anticipated. Although the study status and safety data was regularly reviewed by the study DSMB, injections were discontinued in April 2011 after a separate WHO review panel assessed that the risks of side effects outweighed the benefits of continuing the trial. All men still active at that time were transitioned into Recovery. As of October 2012, spermatogenesis in only two men had not fully recovered. Data analysis began in 4Q 2012.

Conclusion: Available results for sperm suppression, contraceptive efficacy, adverse events, changes in key physical findings and hormone levels, recovery, and other preliminary data will be presented.

COMPARISON OF INFRAPUBIC VERSUS TRANSCROTAL APPROACHES FOR INFLATABLE PENILE PROSTHESIS PLACEMENT: A MULTI-INSTITUTION REPORT
Landon Trost, MD¹, Aaron Boonjindaisup, MD², Ahmet Gokce, MD² and Wayne Hellstrom, MD, FACS²
¹Mayo Clinic; ²Tulane University School of Medicine, New Orleans, LA
(Presented By: Landon Trost, MD)

Introduction and Objectives: Inflatable penile prostheses (IPP) are commonly placed via infrapubic or transcrotal approaches. Currently, no studies compare surgical outcomes between these techniques. The goal of the current study is to compare results of IPPs placed via an infrapubic versus transcrotal approach.

Materials and Methods: High volume surgeons placing the Titan 0-degree prosthesis from March – April 2012 completed questionnaires. Variables recorded included patient pre-operative characteristics, intra-operative variables and overall subjective experience with the new device. Resultant data was compared between surgeons performing an infrapubic versus transcrotal approach for total length of prosthesis, length of proximal and distal measurements, size of rear tip extenders (RTEs), volume of reservoir inserted, amount of reservoir fluid instilled and ability to successfully place the reservoir in the space of Retzius.

Results: Forty-six surgeons placed 256 IPPs, with a median of 5 (range 1 – 10) inserted. Surgical approach was listed in 220 cases, with transcrotal performed most commonly (80%). Revision procedures accounted for 13% of cases, with 19% of patients overall previously undergoing robotic-assisted prostatectomy. Compared to the infrapubic approach, transcrotal placement resulted in a longer total prosthesis (22.3cm vs. 20.6cm, p<0.0001), increased proximal dilation (10.1cm vs. 8.6cm, p<0.0001), longer RTEs (1.9cm vs. 1.2cm, p<0.0001), and larger reservoir fill volume (79cc vs. 71cc, p<0.0003). No differences were noted in distal measurements or ability to place the reservoir in the space of Retzius.

Conclusion: Compared to the infrapubic approach, high-volume surgeons placing the Titan 0-degree IPP transcratally achieved increased proximal dilation with an approximately 1 – 2 cm longer prosthesis inserted.

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Andrology, 2013, 1 (Suppl. 2), 58
MORPHOGENESIS OF THE DEVELOPING WOLFFIAN/EPIDIDYMAL DUCT IS DEPENDENT UPON PROTEIN TYROSINE KINASE 7 AND ITS POTENTIAL DOWNSTREAM TARGET, MYOSIN II

Bingfang Xu, Ling Yang, Chirag Patel, Angela Washington, James Jack, Margot Williams, Ann Sutherland, Xiaowei Lu and Barry Hinton

Introduction: The epididymis plays a crucial role in the maturation of spermatozoa, without a fully developed and functional epididymis male infertility will result. To better understand the nature and causes of epididymal congenital defects that lead to male infertility, it is important to understand the processes of Wolffian/epididymal development.

Materials and Methods: A major event during Wolffian/epididymal development is duct elongation and coiling. We have discovered that mice with a conditional knockout of protein tyrosine kinase 7 (Ptk7), a major regulator of the non-canonical WNT/planar cell polarity pathway, from the mesoderm cells using T-Cre have a shortened epididymal duct and an abnormal coiling pattern compared to controls of the same age. In the Ptk7 knockout epididymides, the cell density was increased at embryonic day 18.5 (E18.5) compared to controls, and unlike controls, the epithelium of Ptk7 knockouts appeared to undergo stratification from postnatal day 14 onwards. From E18.5 onwards, the surrounding mesenchymal cells in the control were flattened and elongated, whereas the mesenchymal cells in the PTK7 conditional knockout epididymides were less organized and less elongated.

Results: These findings are consistent with the suggestion that epithelial and mesenchymal cells fail to undergo intercalation in the Ptk7 conditional knockout epididymides. Cell proliferation, apical-basal polarity of epithelial cells and the formation of the extracellular matrix were not impaired in Ptk7 conditional knockout epididymides. However, phosphorylation of myosin regulatory light chain, a marker for myosin contractility, in the surrounding mesenchymal cells was reduced following loss of Ptk7. Based upon this observation, we propose that PTK7 regulates myosin activity in the surrounding mesenchymal cells, which in turn regulates epididymal duct coiling. Consistent with this model, we found that epididymal duct coiling positively correlated with myosin activity in the mesenchymal cells at E18.5. Further, elongation and coiling decreased when E16.5 ducts were incubated with blebbistatin, an inhibitor of nonmuscle myosin II. The effect of blebbistatin was reversed upon inhibitor withdrawal.

Conclusion: In conclusion, our data supports the hypothesis that PTK7 regulates Wolffian/epididymal elongation and coiling by regulating epithelial and mesenchymal cell intercalation, and for the mesenchymal cells, it does so by regulating the activity of myosin II.

Funding: Supported by NIH–NICHD HD 069654.
ABSTRACTS

9
GENOMIC DISORDERS ASSOCIATED WITH GENITAL ANOMALIES AND MIDLINE FUSION DEFECTS
Shaye Lewis, PhD¹, Josephine Addai, BS¹, Aysegul Sahin, BS¹, Patience Wildenfels, MD¹, Jill Rosenfeld, PhD² and Dolores Lamb, PhD¹
¹Baylor College of Medicine; ²Signature Genomics Laboratories Perkin Elmer
(Presented By: Shaye Lewis PhD)

Introduction: Congenital defects of the genitourinary (GU) system are a relatively common. Genitourinary diseases such as hypospadias and cryptorchidism occur with a frequency similar to, or greater than other common birth defects such as heart, cleft lip/palate, and Down syndrome. The majority of incidences of hypospadias and cryptorchidism is classified as non-syndromic and idiopathic and cannot be explained by mutations, SNPs or aberrant androgen synthesis or actions. It is well documented that submicroscopic copy number variations (CNVs) are present throughout the genome in humans and are causative for disease phenotypes. We hypothesized that these submicroscopic chromosome aberrations are present in subjects with hypospadias and cryptorchidism and affect dosage sensitive genes that are critical for GU tract development.

Materials and Methods: To test our hypothesis we performed array Comparative Genomic Hybridization (aCGH) using sex-matched genomic DNA (gDNA) from men of proven fertility and normal development (controls) compared to gDNA from subjects diagnosed with hypospadias and cryptorchidism. Quantitative PCR was used to validate de novo or inherited duplications or deletions that were distinct from CNVs found throughout the genome (Database of Genomic Variants – http://projects.tcg.ca/variation/). We identified CNVs in unrelated subjects and with the GU defects under investigation. In patients with cryptorchid testes and midline fusion defects, we observed duplications at 1q25, 5q11, 10q23, 13q32 and 16p11. Genes in these regions regulate processes such as cell proliferation, mitochondrial function, apoptosis and migration. An ~27 Kb deletion affecting 10q25 was observed in a patient with cryptorchid testes and another with both cryptorchid testes and hypospadias. This deletion involves intron 5 of a gene that mediates vesicle transport pathways through interactions with t-SNAREs.

Results: We identified an approximately 300 Kb, GU defect susceptibility region involving 12 genes, in eight patients with 16p11.2 duplication syndrome. Preliminary immunohistochemistry experiments reveal expression of candidate proteins in the genital tubercle and testes of E16.5 mouse embryos.

Conclusion: The function of these genes in male external genitalia development is unknown. Novel, candidate genes identified by aCGH may be required for normal GU tract and male external genitalia development and function. Identification of such genes will improve patient diagnosis and perhaps treatment.

10
WNT SIGNALLING IN THE ADULT HUMAN TESTIS
Genevieve Kerr, Helen Abud¹, Julia Young¹, Katja Horvay¹, Ewa Rappert-DeMeyts² and Kate Loveland¹
¹Monash University; ²Rigshospitalet
(Presented By: Genevieve Kerr)

Introduction: The highly conserved Wnt signalling pathway is required in diverse processes during development such as sex determination and ovary growth as well as for adult tissue homeostasis. Its roles and sites of action in the adult human testis are unknown, and this study builds on recent insights from analysis of mouse models to address this knowledge gap.

Materials and Methods: We interrogated Bouins fixed sections of human testes with complete spermatogenesis using immunohistochemistry and observed that Wnt signalling is active in post-mitotic germ cells, based on the observation of nuclear-localized beta-catenin in pachytene and round spermatids. This pattern was also observed in the adult mouse testis. Acute disruption of Wnt signalling using two mouse models that increase and decrease Wnt signalling levels have been generated in AhCre Apcflox/flox and AhCre β−catflox/flox mice respectively. Both exhibited loss or disruptions to spermatocytes and spermatids with minimal to no affects on spermatogonia.

Results: These data indicate conserved functions for Wnt signalling are of intrinsic importance to spermatogenesis in humans and mice. Because genetic changes that disrupt Wnt signalling are common to many cancers, including colon cancer, we performed beta-catenin immunohistochemistry on sections from testicular cancer patients that included regions with seminoma and non–seminoma. No nuclear beta-catenin was observed in these germ cell tumour types, in agreement with a previous report (Honecker et al 2004 J Path). T-Cam2 cells, a seminoma cell line, also did not show any active Wnt signalling under normal conditions. However, we were able to visualize activation of Wnt signalling in response to the Wnt3a ligand (presented in L-cell medium) with the outcome of nuclear localization of beta-catenin following 1 and 4 hours of exposure.

Conclusion: We propose that beta-catenin mediates Wnt signalling in post-mitotic germ cell types and may be active in seminoma cells under certain conditions. The potential to employ Wnt signalling to alter tumour cell growth outcomes, for example to drive their differentiation, is an exciting prospect to be examined in future experiments.
ABSTRACTS

11
ROLE OF WSX-1 IN THE CYTOPROTECTIVE ACTION OF THE MITOCHONDRIAL PEPTIDE, HUMANIN, ON MALE GERM CELLS
Yue Jia, MD, PhD¹, Yan-He Lue, MD, Prasanth Surampudi, MD, Peter Liu, MD, PhD, Ronald S. Swerdloff, MD, Ku-Khwa Lee, MD, PhD, Pinchas Cohen, MD and Christina Wang, MD
¹Los Angeles Biomedical Research Institute and Harbor-UCLA Medical Center; ²Mattel Children’s Hospital, David Geffen School of Medicine at UCLA; ³David Geffen School of Medicine at UCLA & USC Davis School of Gerontology, Ethel Percy Andrus Gerontology Center
(Presented By: Yue Jia, MD, PhD)

Introduction: We have previously demonstrated that intratesticular administration of synthetic humanin (HN) in rats rescues GnRH-antagonist (GnRH-A) or IGFBP-3 induced male germ cell apoptosis. Humanin has been proposed to signal via a trimeric neurocytokine receptor composed of WSX-1, CNTFR, and GP130. We recently showed that synthetic HN peptide prevents heat-induced germ cell apoptosis via receptors containing GP130/WSX-1 subunits in an ex vivo seminiferous tubule culture system. To further explore the role of WSX-1 in the cytoprotective actions of HN on male germ cells, we studied the effect of heat on germ cell apoptosis in WSX-1 knockout mice.

Materials and Methods: Groups of 4 – 6 adult (12 – 20 weeks old) wild type (WT) and WSX-1 knockout (C57BL/6JN) mice were randomly divided into four groups: 1) vehicle (control group); 2) a single intra-peritoneal (IP) injection of pharmacological doses of synthetic HN (40mg/kg BW) peptide (HN group); 3) testicular hyperthermia 43C for 15 minutes (Heat group); 4) Testicular hyperthermia plus IP injection of HN (Heat+HN group). All animals were euthanized 6 hours after treatment. Germ cell apoptosis were assessed by TUNEL assay and quantified by apoptotic germ cells per Sertoli cells. The interaction between HN and WSX-1 was determined by dot blots and co-immunofluorescence assays.

Results: Testicular hyperthermia increased germ cell apoptosis primarily at early and late stages of seminiferous epithelial cycles in WT (0.79±0.10; TUNEL positive germ cell/Sertoli cell, p<0.01 compared with WT control group, 0.17±0.03) mice. Heat-induced germ cell apoptosis was partially inhibited by synthetic GnRH administration in WT (0.38±0.05, p<0.01). In WSX-1 knockout mice, heat also induced germ cell apoptosis (0.77±0.10; p<0.01 compared with knockout control group, 0.09±0.02) mainly at early and late stages but HN was not effective in preventing heat induced apoptosis (0.56±0.06, p<0.05 compared with heat treatment group). Dot blots showed the interaction of HN peptide and WSX-1 peptide in vitro.

Conclusion: Studies in WT and WSX-1 knockout mice demonstrate that: 1) the anti-apoptotic effect of exogenous HN at superphysiologic dose on heat-induced male germ cell apoptosis is partially mediated through the membrane receptor subunit WSX-1; 2) the membrane receptor subunit WSX-1 may be important for superphysiologic HN actions on governing the fate of germ cell survival and death in testes.

12
INSULIN AS AN IMPORTANT PROSURVIVAL FACTOR FOR HUMAN SPERMATOZOA
R. John Aitken, PhD, ScD¹, Saeed Shokri, PhD², Dwi A. Pujianto PhD³, Benjamin J. Curry, PhD⁴, Sarah J Whiting, PhD⁴ and Lois Salamonsen, PhD⁵
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(Presented By: R. John Aitken, PhD, ScD)

Introduction: Human spermatozoa lose motility and default to an apoptotic pathway in vitro if the ambient medium is not supplemented with prosurvival factors, which serve to maintain the phosphorylation status of the PI3 kinase-AKT1 anti-apoptotic signal transduction pathway.

Materials and Methods: In this study we demonstrate that insulin is a major prosurvival factor for mammalian spermatozoa. These cells not only possess the insulin receptor, INSR-beta, but also the downstream IRS signalling proteins needed to transduce the insulin signal into a biological response.

Results: In addition we demonstrate that dephosphorylation of the receptor accompanies motility loss following the prolonged incubation of human spermatozoa in vitro in the absence of insulin. However, addition of insulin maintains both the insulin receptor and the PI3 kinase/AKT1 pathway in a phosphorylated state, suppresses spontaneous caspase activation and effectively reverses motility loss in vitro. We further demonstrate that insulin is generated by the male germ line and is present in the spermatozoa of all species tested including rat, mouse, stallion and human. The fact that this insulin is synthesized, rather than taken up, by the male germ line is indicated by the presence of C-peptide (a vestige of pro-insulin) in the spermatozoa of all these species. However, in contrast to the beta cells of the pancreas, germ line insulin is not released in response to glucose but is released as these cells ascend the female reproductive tract. In order to ensure adequate insulin stimulation of sperm metabolism during sperm transport through the female reproductive tract we have also secured preliminary evidence indicating that the endometrium generates and releases insulin into the uterine lumen during the estrogen dominated phase of the cycle.

Conclusion: These data indicate that insulin is an important prosurvival factor for spermatozoa and that both the germ line and the female reproductive tract collude to ensure adequate insulin availability for these cells during their passage from the site of insemination to the ampullae of the Fallopian tubes.
**ABSTRACTS**

Sunday, April 14, 2013
11:00 a.m. - 12:30 p.m.

**Poster Session I**
Location: Regency West 4 – 6

**ANDROGEN / ENDOCRINOLOGY**

13

**EFFECTS OF LONG-TERM TREATMENT WITH TESTOSTERONE UNDECANOATE INJECTIONS IN 850 HYPOGONADAL MEN ON WAIST CIRCUMFERENCE, BODY WEIGHT AND BMI**

Farid Saad, DVM, PhD¹, Aksam Yassin, MD, PhD², Ahmad Haider, MD, PhD³ and Michael Zitzmann, MD, PhD⁴

¹Bayer Pharma AG; ²Institute of Urology and Andrology, Norderstedt, Germany; ³Private Urology Practice, Bremerhaven, Germany; ⁴University of Muenster, Centre of Reproductive Medicine and Andrology

(Presented By: Farid Saad, DVM, PhD)

**Introduction:** Testosterone has been consistently shown to increase lean mass and decrease fat mass. While the current literature suggests that testosterone treatment in hypogonadal men decreases waist circumference, there seems to be no effect on total body weight. There are only four studies on testosterone treatment with a duration of three years. Long-term data on effects on body weight and waist circumference are lacking.

**Methods:** Observational registry studies of 850 men with testosterone levels ≤12.1 nmol/L from three German centers (two urological, one andrological). Patients received testosterone undecanoate injections for up to 60 months with a few patients treated for up to 15 years.

**Results:** In cohort A (255 men, mean age: 60.6 years; Haider), waist circumference decreased from 107.24±9.14 to 98.46±7.39 cm (p<0.0001). Body weight decreased from 106.22±16.93 to 90.07±9.51 kg (p<0.0001), BMI from 33.93±5.4 to 29.17±3.09 kg/m² (p<0.0001).

In cohort B (261 men, mean age: 58 years; Yassin), waist circumference decreased from 107.68±10.02 to 97.36±7.56 cm (p<0.0001). Body weight decreased from 100.15±14 to 92.46±10.17 kg (p<0.0001), BMI from 31.75±4.42 to 29.32±2.94 kg/m² (p<0.0001).

In cohort C (334 men, mean age: 42 years; Zitzmann), waist circumference decreased from 114.0±10.5 to 94.1±8.7 cm (p<0.0001). Body weight decreased from 103.8±16.3 to 79.1±12.6 kg (p<0.0001), BMI from 31.8±5.2 to 24.4±3.2 kg/m² (p<0.0001).

**Conclusion:** The unexpected and unintended weight loss observed in our cohorts exceeds results of weight loss reported studies using lifestyle interventions with and without drugs. Testosterone may be a useful tool to facilitate weight loss in hypogonadal men.

14

**ORAL ENCLOMIPHENE CITRATE LOWERS IGF-1 IN MEN WITH SECONDARY HYPOGONADISM WHILE RAISING TESTOSTERONE, LH AND FSH: IMPLICATIONS FOR CANCER PREVENTION**

Ronald Wiehle, PhD and Gregory Fontenot, PhD
Repros Therapeutics

(Presented By: Ronald Wiehle, PhD)

**Introduction and Objectives:** Lowered hGH and IGF-1 have been linked with protection from cancer. We determined the levels of pituitary hormones plus IGF-1 in men with secondary hypogonadism under treatment with enclomiphene citrate (Androxal®) in comparison to topical testosterone (T).

**Materials and Methods:** Two distinct, randomized, single blind, phase II studies evaluating daily oral Androxal versus a topical T comparator (Testim®) were performed: ZA-201 investigated 12 men taking 25mg of Androxal in comparison to Testim® for 6 months, and ZA-204 investigated 47 men taking 6.25mg, 12.5mg and 25mg Androxal versus AndroGel® for 6 weeks. All subjects had initial total T <350 ng/dL and low-to-normal LH (<12I U/L). Serum samples were taken for T, LH and FSH at various trial periods before and after administration of agents. We could not reliably measure serum hGH directly but measured its distal marker, liver-produced IGF-1.

**Results:** Both oral and topical treatments raised T into the normal range (300 – 1000 ng/dL). Androxal elevated LH and FSH. AndroGel and Testim decreased LH and FSH. Unexpected was the strong action of Androxal to lower serum IGF-1. Both Androxal and topical T lowered serum IGF-1 but Androxal was more effective. An example is given from ZA-204. Dose groups showed no differences in IGF-1 before treatment (p = 0.94) but significance after (p = 0.03, Kruskal-Wallis).

**Conclusion:** The endocrine profile indicates that Androxal acts to stimulate the pituitary, resulting in a restoration of gonadotropin activity consistent with normalization of LH and FSH. This process is different from T replacement seen with topical products and represents a new way to relieve low T in men with an intact hypothalamus-pituitary-testicular axis. If Androxal can lower hGH or IGF-1 in aging men at risk for prostate and other cancers, its use in that population clearly at risk for secondary hypogonadism represents an important new treatment option.
**15**

**DIFFERENTIAL EFFECTS OF COX-2 (AN INFLAMMATORY MEDIATOR) IN NORMAL AND CANCEROUS PROSTATE EPITHELIAL CELLS**

Shariika Hagan, PhD, Prithiviraj Elumalai, Kamatchi Anbazhagan, Manish Ranjan, Asim Abdel Mageed, PhD and Suresh Sikka, PhD
Tulane University School of Medicine, New Orleans, LA
(Presented By: Shariika Hagan, PhD)

**Introduction:** Inflammation plays a key role in the etiology and progression of prostate diseases such as prostatitis and prostate cancer. How inflammation transforms normal prostate tissue into neoplastic stage is not known.

**Objective:** We hypothesize that upon treatment with the bacterial lipopolysaccharide (LPS), the non-tumorigenic normal epithelial cell line, RWPE-1 will mimic inflammatory affects as seen in prostatitis and cancerous cells. The present study investigates the effect of LPS on activation of inflammatory signals in noncancerous RWPE-1 cells in comparison to cancerous LNCaP cells.

**Methods:** RWPE-1 and LNCaP cells were used as models for inducing inflammation in normal prostate epithelial cells and prostate cancer, respectively. Various doses (1, 10, and 100 µg/mL) of LPS for RWPE-1 and the unsaturated fatty acid arachidonic acid (AA) (0 – 5 µM) for LNCaP cells were used to stimulate inflammation. Cytotoxicity in these cells was monitored by WST-8 after 24 hrs of treatment. COX-2 protein expression was determined by Western blot analysis in RWPE-1 cells treated with LPS and LNCaP cells treated with AA.

**Results:** Western blot analysis showed that COX-2 expression was up-regulated by both LPS and AA in a concentration dependent manner in RWPE-1 cells & LNCaP cells, respectively. Interestingly, lower doses of LPS of up to 5µg/mL were not cytotoxic to both RWPE-1 and LNCaP cells.

**Conclusion:** RWPE-1 cells treated with LPS mimicked the up-regulation of COX-2, while only high doses showed this up-regulation of COX-2 in LNCaP cells treated with AA. LPS induced inflammation in RWPE-1 cells will be used for future studies of inflammatory signaling in the transformation of normal prostate cells to prostatic disease.

**16**

**ADRENALECTOMY AND DEXAMETHASONE TREATMENT INDUCED CHANGES IN TESTICULAR MORPHOLOGY AND SPERM PARAMETERS IN ADULT RATS**

Erick Silva, PhD¹, Vanessa Vendramini, PhD¹, Adriana Restelli, PhD¹, Ricardo Bertolla, PhD¹, Wilmas Kempinas, PhD² and Maria Christina Avelar, PhD²
¹Universidade Federal de São Paulo; ²Universidade Estadual Paulista
(Presented By: Erick Silva, PhD)

**Introduction:** Glucocorticoids (GC’s) are stress-induced steroid hormones, synthesized and secreted by the adrenal cortex. These hormones are crucial to survival, regulating a myriad of physiological process, including metabolism, immune response, and reproduction. In the male reproductive tract, high levels of GC’s are known to have deleterious effects in reproduction. However, the physiological roles of GC’s in spermatogenesis and sperm maturation in the epididymis remain unknown.

**Materials and Methods:** Here, we investigated the effect of bilateral adrenalectomy (ADX) and dexamethasone (Dex) treatment on the morphology of testis and epididymis, and quantitative and qualitative sperm parameters in rats. Male rats (90 days old; n=6/group) were divided into sham-operated (control) and ADX groups, and sacrificed 1, 2, 7, and 15 days after surgery. Another group of rats were submitted to ADX, immediately treated with Dex (5 µg/kg, i.p.) for 6 consecutive days and sacrificed 7 days after surgery.

**Results:** Sperm count revealed a significant reduction in the number of testicular homogenization-resistant spermatids and in the daily sperm production in 2-, 7- and 15-day ADX rats in comparison to their respective control groups; whereas epididymal sperm number was significantly reduced in the caput/corpus epididymis from 15-day ADX rats, and in the cauda epididymis from 2- and 7-day ADX rats. Sperm transit time was significantly increased only in the caput/corpus epididymis from 7-day ADX rats. Dex treatment prevented the changes in testicular and epididymal sperm count induced by 7 days of ADX. Qualitative analysis of spermatozoa from the cauda epididymis indicated no effect induced by ADX in sperm motility, morphology, mitochondrial activity and acrosome integrity. However, the alkaline comet assay revealed an increase in DNA fragmentation in caput epididymal spermatozoa isolated from 15-day ADX rats in comparison to control group. Testicular cross sections from 7-day ADX rats displayed more frequently damaged seminiferous tubules in comparison to control group, as indicated by a significant increase in the number of tubules with intraepithelial vacuoles, with sloughed germ cells detached into the lumen, and with multinucleated germ cells. These changes were not prevented by Dex treatment.

**Conclusion:** In conclusion, our results indicated that spermatogenesis and post-testicular sperm maturation are under the influence of GC’s, providing new insights into the importance of these hormones in male fertility.

**17**

**DRUG LIGAND-INDUCED ACTIVATION OF TRANSLOCATION PROTEIN (TSPO) STIMULATES STEROID PRODUCTION BY LEYDIG CELLS FROM THE TESTES OF AGED BROWN NORWAY RATS**

Jin Yong Chung, PhD, Haolin Chen, PhD, Andrew Midzak, PhD, Vasileios Papadopoulos, PhD and Barry Zirkin, PhD
(Presented By: Jin Yong Chung, PhD)

**Introduction:** Cholesterol transfer from intracellular stores into mitochondria is the rate-determining step in Leydig cell testosterone production. We reported previously that reduction in translocator protein (18-kDa; TSPO), a high affinity cholesterol-binding protein, is associated with reduced testosterone production by aged rat Leydig cells. We hypothesized herein that despite these reductions, the direct, pharmacological activation of TSPO in aged cells with drug ligands might induce the cells to produce significantly higher levels of testosterone.

**Materials and Methods:** To test this, we examined the effects of the TSPO selective and structurally distinct drug ligands N,N-diethyl-2-(4-fluorophenyl)indole-3-acetamide (FGIN-1-27) and benzodiazepine 4’-chlorodiazepam (Ro5-4864) on steroidogenesis by Leydig cells isolated from sexually mature (21 – 24 month−old) and young adult (3 – 6 month-old) Brown Norway rats.

**Results:** The ligands increased Leydig cell steroid production by cells of both ages. Their stimulatory effects were significantly reduced by the specific TSPO inhibitor 5-androsten-3,17,19-triol (19-Artil). Whereas testosterone production in response to luteinizing hormone (LH) was reduced in aged as compared to young cells, testosterone production in response to the TSPO drug ligands was equivalent. Moreover, ligand-stimulated aged cells produced testosterone at levels equivalent to those of cells stimulated by LH at 0.1 ng/ml, the LH concentration found in aged rat serum.
Conclusion: These results suggest that the reduced activation of TSPO in aged Leydig cells might contribute significantly to age-related reductions in testosterone production. The results also suggest that the direct stimulation of TSPO might serve as a therapeutic approach to increase steroid production within the testes and in serum in cases of primary hypogonadism.

ENVIRONMENT / TOXICOLOGY

18

EFFECT OF ROSMARINIC ACID ON LEYDIG CELLS APOPTOSIS AFTER EXPOSED WITH ELECTROMAGNETIC FIELDS (EMF) IN RATS
Arash Khaki, DVM, PhD
Women’s Reproductive Health Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
(Presented By: Arash Khaki, DVM, PhD)

Introduction & Objectives: Rosmarinic acid belongs to the group of polyphenols; it has antioxidant, anti-inflammatory and antimicrobial activities and help to prevent cell damage caused by free radicals.

Methods: Wistar male rat (n=40) were allocated into three groups, control group (n=10) that received 5cc Normal saline (0.9% NaCl) daily by gavage method and Rosmarinic acid group that received 5mg/rat (gavage)(n=10), and EMF group that exposure with 50hz (n=20) which was subdivided to two groups of 10; EMF group and treatment group. Treatment group received 5mg/rat (gavage) Rosmarinic acid, daily for 6 weeks, respectively; however, the control group just received an equal volume of distilled water daily (gavage). In 42th day of research, 5cc blood was collected for measure sex hormones, TAC, GPX and MDA levels from whole groups analysis.

Results: Level of MDA and apoptosis significantly decreased in group that has received 5mg/rat of Rosmarinic acid (P<0.05) in comparison to experimental groups .number of apoptotic leydig cells, testosterone, TAC and GPX significantly increased in groups that received Rosmarinic acid (P<0.05).

Conclusion: Since in our study5mg/rat of Rosmarinic acid, have significantly preventive effect on cell damages especial leydig cells apoptosis that caused with EMF, so it seems that using Ro as food additive can be effective for supporting peoples that living in EMF environment.

Keywords: Apoptosis, EMF, Ledig cell, Rosmarinic acid, Testosterone.
ABSTRACTS

20 CARNITINE PARTIALLY PROTECTS THE TESTIS AGAINST THE LATE DAMAGE PRODUCED BY DOXORUBICIN ADMINISTRATION TO PREPUBERTAL RATS
Regina Cabral, PhD, Student, Vanessa Vendramini, Co-Advisor, Fátima Okada, Collaborator, Taiza Stumpf, Collaborator and Sandra Miraglia, Advisor
Federal University of São Paulo/Brazil
(Presented By: Regina Cabral, PhD, Student)

Introduction: Doxorubicin, an anticancer drug, is widely included in chemotherapy protocols to combat childhood cancer. Carnitine, an amino acid found in testis and epididymis, is involved in sperm maturation; it has been used in infertility treatment. In a previous study, we observed that L-carnitine given before the etoposide, another chemotherapeutic drug, reduces the spermatogenic damage and protects germ cells against apoptosis.

Objectives: The current study aimed to evaluate the antiapoptotic and cytoprotective actions of L-carnitine, in long and mid-term basis, on the seminiferous epithelium of doxorubicin-treated prepubertal rats.

Methods: Forty-eight 30-day-old male Wistar rats were distributed into 4 groups: sham control (0.9% saline solution); doxorubicin (Pfizer®, 5mg/kg, single dose – s.d.); L-carnitine (Sigma, 250mg/kg, s.d); L-carnitine/doxorubicin (s.d carnitine injected one hour before doxorubicin). The rats were submitted to euthanasia at 64 and 100 days of age and their testes were collected for biometric, morphometric and histopathological analyses; they were Bouin’s liquid-fixed and paraffin-embedded. The numerical density of apoptotic germ cells was obtained (TUNEL method). In adult phase (100 days), the following spermatogenic parameters were also analyzed: mature spermatid (19 step) count and sperm daily production per testis; sperm number and transit time through the epididymal caput/corpus and cauda; frequency of morphologically abnormal spermatozoa (from epididymal fluid) as well as sperm DNA integrity (Comet Assay).

Results: The testicular and spermatogenic parameters at both ages analyzed improved in rats previously treated with carnitine, before the anticancer drug. At 64 days, the TUNEL-positive germ cell frequency was lower in the carnitine/doxorubicin-treated rats comparatively to the doxorubicin-treated rats. At 100 days of age, the sperm DNA fragmentation was also reduced in these previously carnitine-treated rats, as evidenced by the following parameters: percentage of DNA in the comet tail, comet tail length and DNA integrity (Olive tail moment).

Conclusions: Carnitine reduced the late testicular and spermatogenic damages caused by doxorubicin, probably providing a partial cytoprotection against the deleterious action of this anticancer drug administered to prepubertal rats. However, further studies shall be undertaken in order to investigate the protective mechanisms involved in such germ cell preservation.

21 EFFECTS OF ORAL ADMINISTRATION OF THE FEMALE CONTRACEPTIVE ETHINYL ESTRADIOL (EE) ON PENILE DEVELOPMENT
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(Presented By: Lilian Okumu)

Introduction and Objectives: We previously reported that subcutaneous (sc) administration of EE or diethylstilbestrol (DES) to neonatal rats induced infertility and penile mal-development, characterized by loss of cavernous smooth muscle cells and decreased expression of myosin heavy chain 11 (Myh11) and alpha actin (Acta), markers for smooth muscle cell differentiation. The objective of the present study is to determine whether similar penile malformations at the cellular and molecular levels occur when EE is administered orally, a route that is used by women worldwide for taking contraceptives.

Methods: Pups were administered EE (100 ng/kg, ten-times higher than the environmentally relevant dose) orally, daily, from post-natal days 1 – 15. Fertility was tested at 100 days and tissues were collected at 120 days for morphometry, histopathology, immunohistochemistry, testosterone assay, and quantitative real time PCR (QT–PCR).

Results: Penile measurements including weight, length and diameter, were significantly (p<0.05) decreased by 22 – 60%, compared to controls; however, the body weight was not different from controls. Histopathologically, penises in treated animals showed accumulation of fat cells and loss of smooth muscle cells and cavernous spaces in the corpora cavernosa, but not in the corpus spongiosus, of the body of the penis. QT-PCR showed 70% or higher reduction (p<0.05) in Myh11 and Acta mRNA expression in treated animals, compared to controls. A reduction in Acta mRNA expression was supported by decreased ACTA protein expression at the immunohistochemical level. Testicular and plasma T levels were significantly decreased in treated animals, indicating that steroidogenic activity was permanently altered after EE treatment. While all control animals (n = 5) deposited vaginal plugs and sired pups, none did so in the case of treated animals (n = 5), implying that infertility probably resulted from penile dysfunction.

Conclusion: In conclusion, oral administration of the contraceptive EE induced infertility and penile mal-development, characterized by loss of cavernous smooth muscle cells and reduced expression of Myh11 and Acta at the mRNA and/or protein levels, similar to that induced by sc administration of DES. (Funded by NIH grants SSC1ES019355 (to H.G.) and RCMI-5-G12RR03059).
THE EFFECT OF CYCLOPHOSPHAMIDE ON HUMAN FETAL TESTIS XENOTRANSPLANTS: HISTOLOGY, GENE EXPRESSION PATTERNS AND BIOLOGICAL PATHWAYS
Mary Samplaski, MD¹, Yingchun Zhu, MD¹, Huayun Hou, BSc², Gary Bader, PhD², Bharati Bapat, PhD², Keith Jarvi, MD¹, Colin McKerlie, DVM, PhD² and Kirk Lo, MD¹
¹Mount Sinai Hospital; ²University of Toronto
(Presented By: Mary Samplaski, MD)

Introduction: Oncologic treatment with cyclophosphamide (CPP) leads to male infertility. To understand the gonadotoxicity of CPP, we used our human testis xenotransplant model (testis functionally and histologically similar to pre-pubertal testis) to study testicular changes in histology and gene expression after exposure to CPP.

Objectives: To investigate changes in histology and gene expression patterns in human xenotransplanted testis after exposure to low and high-dose CPP.

Methods: Twelve weeks after xenotransplantation, mice were given weekly intraperitoneal injection of saline, low (50 mg/kg) or high-dose (200 mg/kg) CPP for 5 weeks. Grafts were harvested 1 week later and analyzed for histology and immunohistochemistry. Laser capture microdissection was used to isolate intra-seminiferous tubular cells from grafted tissues. Gene expression profiling was performed (Affymetrix GeneChip platform), followed by pathway enrichment analysis (p-value cutoff: 0.05, FDR cutoff: 0.5) and enrichment map visualization, to identify pathways whose genes were differentially expressed.

Results: Of 15 mice, 5/5 (100%) treated with saline, 4/5 (80%) with low-dose, and 2/5 (40%) with high-dose CPP survived. Grafts were harvested from 3 mice treated with saline, 4 with low-dose, and 1 with high-dose CPP. No histological differences were noted. Enrichment analysis (Fig 1) comparing low-dose CPP and saline treated mice revealed downregulation of genes involved in germ line pathways (germ plasm, pole plasm, P-granule, DNA methylation of gamete generation), and genes involved in the MAPK/ERK pathway in the low-dose CPP treated group. Genes related to translation and cell cycle processes were upregulated. These changes were consistent with those seen in high-dose CPP treated mice.

Conclusions: High-dose CPP resulted in a lower mouse survival. While no gross histologic differences were seen in the xenografted testis, there were dramatic changes in expression profiles with downregulation of genes involved in germ line specific pathways and the MAPK/ERK pathway. This is the first study of the effects of CPP on human fetal testicular tissue and demonstrates genetic changes due to CPP, which may help elucidate the gonadotoxic effects of CPP.
CHARACTERIZATION OF FERTILITY IN RNASE9 KNOCK-OUT MICE

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(Presented By: Andrew Westmuckett, PhD)

ABSTRACTS

Introduction and Objectives: Tyrosylprotein sulfotransferases (Tpst1 and Tpst2) catalyze sulfation of specific tyrosine residues in certain proteins in the trans-Golgi network. Previously, we reported that Tpst2−/− males are sterile despite normal spermatogenesis and that Tpst null sperm have motility defects, impaired fertilization of ZP−intact eggs, and lack ADAM6 and ADAM3 expression that may in part explain the male sterility. Nevertheless, the data also strongly suggest that tyrosine sulfation of unidentified substrate(s) play a crucial role in male fertility. To identify candidate tyrosine-sulfated proteins in the epididymis we used affinity chromatography on PSG2, an anti-sulfotyrosine mAb, coupled with mass spectrometry. Among several candidates identified was Rnase9, an inactive RnaseA family member of unknown function that is expressed only in epididymis after onset of sexual maturity. We confirmed that Rnase9 is tyrosine−sulfated in wild type (wt), but not Tpst2−/− mice, despite comparable Rnase9 protein expression (Hoffmanes et al, J Biol Chem 284:3096, 2009). These findings suggest that lack of Rnase9 sulfation might contribute to the sterility of Tpst2−/− males.

Methods: To assess the role of Rnase9 in fertility, we generated Rnase9 knockout mice.

Results: Rnase9+/− males and females appear normal and, when interbred, yield litters of normal size and Mendelian inheritance of the mutant Rnase9 allele. Western blot and qPCR analysis of Rnase9−/− epididymides confirmed lack of Rnase9 transcripts and protein expression, respectively. Testes and epididymis histology of Rnase9+/− males was normal. Reproductive performance was first assessed in unrestricted pairwise mating trials between Rnase9+/− males and females. Females were examined for vaginal plugs each morning and the litter size was recorded. We observed no difference in plugging latency between Rnase9+/− and wt mating pairs (3.3 ± 2.6 d, n = 12 vs. 2.0 ± 0.8 d, n = 7, mean ± SD, p = 0.15), indicating that estrous cycle length in Rnase9+/− females is normal. In addition, we observed no difference in the litter size between Rnase9+/− and wt mating pairs (5.8 ± 1.5 pups, n = 17 litters vs. 5.9 ± 1.0 pups, n = 11 litters, mean ± SD, p = 0.77).

Conclusions: These data demonstrate that Rnase9+/− males and females are fertile. More detailed analyses of sperm function in Rnase9+/− males, including sperm counts, morphology, motility, capacitation, and ability to fertilize eggs are underway.

APOTOPSIS AND NF-KB OVEREXPRESSION IN THE SMOOTH MUSCLE CELLS OF RAT VAS DEFERENS FOLLOWING H2 RECEPTORS ANTAGONIST TREATMENT

Estela Sasso-Cerri, PhD¹,², Juliana Koshimizu Pharmaceutical¹,², Flávia Luciana Beltrame, PhD, Student¹,², José Paulo de Pizzol, Jr., Graduation Student¹,², Breno Henrique Caneguim, PhD, Professor¹,² and Paulo Sérgio Cerri, PhD, Professor¹,²

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(Presented By: Estela Sasso-Cerri, PhD)

Introduction and Objectives: The histamine H2 receptors antagonist – cimetidine – has caused adverse effects on the male reproductive histophysiology due to its antiandrogenic action. In the testes, additionally to seminiferous epithelium damages, cimetidine has caused peritubular myoid cell death and also microvasculature atrophy due to death of vascular muscle cells. Androgen and histamine H2 receptors have been detected in the vas deferens epithelial and smooth muscular layers. Thus, the effect of cimetidine on the structure and function of rat vas deferens, focusing on the muscular layer, was evaluated.

Methods: The animals from cimetidine group (CMTG; n=5) received 100 mg/kg b.w. of cimetidine for 50 days; the control group (CG) received saline solution. The distal portions of vas deferens were fixed and embedded in paraffin; the epithelial perimeter and area of the smooth muscular layer were obtained in Masson’s trichrome-stained sections. TUNEL method and NF-kB immunohistochemical reaction were also carried out. The birefringent collagen in the muscular layer was quantified in picrosirius red-stained sections under polarized light. The muscular layer was also evaluated under Transmission Electron Microscopy (TEM). The mucosa of vas deferens of rats from CMTG was intensely folded.

Results: The epithelial perimeter and the area of muscular layer decreased significantly and numerous TUNEL-labeled nuclei were found in the epithelial cells, mainly basal cells, and in the muscle cells. Typical features of apoptosis in the muscle cells were also observed under TEM. Moreover, an enhanced cytoplasmic NF-kb immunoreaction was found in the muscle cells of CMTG. However, significant difference in the birefringent collagen content was not found between CMTG and CG. The significant damages caused by cimetidine in the epithelium can be related to a possible antiandrogenic effect of this drug on the basal cells turnover.
Introduction and Objectives: Sperm acrosome associated protein 7 (Spaca7) is a novel protein found only in post-meiotic germ cells, including spermatozoa. We identified Spaca7 in a screen to identify putative tyrosine-sulfated proteins expressed in the male genital tract of mice using anti-sulfotyrosine antibody affinity chromatography coupled with mass spectrometry. Genomic and expression databases indicate that the gene spans 8 exons on chromosome 8 and the protein is expressed from a 761 bp transcript that is detected only in testis. The transcript predicts a 182-residue precursor polypeptide with a signal peptide, a single N-glycosylation site, and no cysteines. Thus, Spaca7 should be secreted as a 17.3 kDa monomer assuming that no post-translational modifications are present. Orthologous genes are present in the rat, rabbit, and various primates, including man. However, Spaca7 has no homology to known proteins and therefore we have little insight into its function(s).

Methods: We developed a polyclonal antibody to mouse Spaca7 using bacterial recombinant protein as the immunogen. Immunoblotting detects Spaca7 only in the testis starting at ~p21 coinciding with the onset of meiosis, but not in other tissues.

Results: Immunoblots of subcellular fractions of testis indicate that the protein is soluble in 0.1 M Na2CO3, pH 11.5. We next examined what cells express Spaca7 by immunofluorescence staining of tissue sections and cytologic smears of germ cells isolated from seminiferous tubules. Our analyses show that Spaca7 is expressed only in post-meiotic germ cells beginning with round spermatids. Immunofluorescence staining along with immune-gold electron microscopy shows that Spaca7 is localized to the proacrosomal granule of germ cells and the acrosome of testicular spermatozoa. To determine if Spaca7 is involved in fertilization, we performed in vitro fertilization assays in the presence of testicular spermatozoa. To determine if Spaca7 is involved in fertilization, we performed in vitro fertilization assays in the presence of testicular spermatozoa. We observed that anti-Spaca7 IgG significantly inhibited fertilization of cumulus-intact oocytes compared to control IgG.

Conclusions: Spaca7 is a novel acrosomal protein of unknown function. Our finding that anti-Spaca7 antibody inhibits fertilization of cumulus-intact oocytes in vitro suggests that Spaca7 is involved in fertilization.
FREQUENCY OF Y CHROMOSOME MICRODELETIONS AMONG INFERTILE MALES IN ARMENIA
Ruben Burnazyan, PhD, Nora Nalbandyan, PhD and Tamara Sargsyan, Prof
(Presented By: Ruben Burnazyan, PhD)

Introduction and Objectives: Infertility is a problem that affects couples everywhere in the world with the prevalence of about 8% (WHO scientific group). The origin of male infertility is a combination of environmental and inherited factors. Besides chromosomal defects, among genetic factors one of reasons for severe spermatogenic defects is mutations in the cystic fibroses gene and microdeletions of Y chromosome. Three mirodelitions regions termed AZFa, AZFb and AZFc connected with pathogenesis of spermatogenesis failure are defined in the euchromatic part of Y chromosome. 7% of men from infertile couples, visiting andrological departments in Armenia are azoospermic or severe oligozoospermic.

Methods: Men with concentration of spermatozoids < 5 mln /ml were subjected to PCR analysis. DNA of 157 patients has been analyzed in this study.

Results: 1 patient of them (0.64%), revealed Y chromosome microdelitions in AZFa region (SY84, SY86, SY 615), 1 patient (0.64%) in AZFb region (SY127, SY134), 3 patients (1.91%) in AZFc region (SY 254, SY255), 1 patient (0.64%) in AZFa+AZFb regions (SY134, SY 615), 1 patient (0.64%) in AZFb+AZFc regions (SY254, SY 134, SY 255) and 1 (0.64%) in AZFa+AZFb+AZFc regions (SRY, ZFY, SY254, SY84, SY 134, SY 127).

Conclusion: Current data of the Y chromosome microdeletion frequency among Armenian patients are preliminary and will be continued in the future. Importance of this analysis has increased recently after the introduction of IVF and ICSI.

NOVEL METHYLATION-SPECIFIC QUANTITATIVE PCR TEST FOR THE DIAGNOSIS OF KLINEFELTER SYNDROME
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Weill Cornell Medical College
(Presented By: Akanksha Mehta, MD)

Introduction: Klinefelter syndrome (KS) is greatly under-diagnosed in affected men, due to the cost and varying sensitivity and specificity of karyotype and fluorescent in situ hybridization (FISH) analyses. The aim of this study was to design a quantitative, sensitive, and cost-efficient laboratory test for the diagnosis and quantification of X-chromosome (X-ch) disomy.

Methods: DNA was extracted from the peripheral blood of male and female controls, thirteen 47, XXY males, and two 47, XXY/46, XY mosaic males, and deaminated (Qiagen EpiTect Bisulfite Kit). Methylation-specific real-time polymerase chain reaction (RT-PCR) was performed on the Roche 480 LightCycler platform, using primers for unmethylated and methylated X-ch inactive-specific transcript (XIST-U and XIST-M) genes, and PerfeCta SYBR green PCR master mix. Standard curves were generated via quintuplicate RT-PCR reactions with serial 10-fold dilutions of female control DNA. Limit of detection (LOD) of mosaicism was investigated via triplicate RT-PCR reactions of 46, XY/46, XX control DNA in concentration ratios of 0:100 to 99:1. Data analysis, performed using Roche LightCycler software v.3.5.3, included determination of crossing points (CPs), and melting curve analysis. Degree of mosaicism in 47, XXY/46, XY males was compared with karyotype and FISH results.

Results: X-ch disomy, based on XIST-U and XIST-M expression, was detected in all female controls and KS patients. 46, XY controls expressed XIST-M only. CPs for XIST-U and XIST-M ranged from 29 to 32.5 (SD 0.8). Linear regression analysis with best-fit curve showed a statistically significant relationship between the calculated percentage of X-ch disomy and observed XIST-U/XIST-M ratio (r=0.98, p<0.001). LOD of mosaicism was 1%. Uniformity of melting peaks on melting curve analysis confirmed specific amplification of a single PCR product. Based on XIST-U/XIST-M ratios for 47, XXY/46, XY patients, the calculated degree of mosaicism (1.8% and 17.8%) was comparable to the results of karyotype and FISH analysis (2.3% and 15%, respectively). Turnaround time from DNA deamination to final data analysis was under 9 hours.

Conclusion: RT-PCR is a sensitive, specific, efficient, and cost-effective test for the detection of X chromosome disomy, with applicability for the screening and diagnosis of KS, even in the setting of low degree of 47, XXY/46, XY mosaicism. Validation of this test on a larger patient sample, in peripheral blood and testis tissue, is planned.
ABSTRACTS

INFERTILITY / ART / MALE CONTRACEPTION

30 EFFECTS OF PDE5 INHIBITORS ON SPERM MOTILITY, SPERM MEMBRANE PERMEABILITY, AND SPERM DNA STRUCTURE

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(Presented By: Evlalia Vlachopoulou BS)

Introduction: We evaluated the effects of tadalafil on sperm motility, sperm membrane permeability, and sperm DNA fragmentation index (DFI) as measured with sperm chromatin structure assay (SCSA).

Methods: A semen sample was collected from each of 19 men selected from a general population of men visiting a urology outpatient clinic (group A). After a swim up procedure, motile spermatozoa populations were collected from each sample. Then two 1 ml-aliquots (C and EXP aliquots) containing washed spermatozoa suspended in a culture medium were prepared from each of the above 19 men. Tadalafil was added to EXP aliquots at a final concentration equal to 1 mg/ml. C aliquots served as control aliquots. Each pair of aliquots was incubated at 37°C under 5% carbon dioxide for 8 hours. At the end of the incubation period the % motile sperms (%MS), the outcome of the hypoosmotic swelling test (%HOST), and the DFI as measured with the SCSA were evaluated (Asian J Androl 2011, 13:69).

Results: Within group A, the mean value of the DFI was significantly larger in Exp aliquots (mean±SD: 63.4±22.3%) than in C aliquots (30.2±12.9% (Wilcoxon test; P<0.05). On the other hand, within the group A, there were no significant differences in the mean value of %MS or %HOST between Exp aliquots and C aliquots.

Conclusion: It may be suggested that elevation of the second messenger cGMP level due to inhibition of PDE5 by tadalafil activates a nuclear cGMP-dependent protein kinase PKG with an overall detrimental effect on sperm chromatin structure. Alternatively we may hypothesize that the effect of tadalafil on sperm DNA is due to the formation of hydrogen bonds between the C=O groups of the molecule of tadalafil and the NH2 group in the guanine moiety of the DNA. The latter hypothesis is strongly supported by previous research efforts indicating a similar mechanism responsible for the interaction between sildenafil with salmon sperm DNA (Biosensors and Bioelectronics 22, 2007, 2471–2477). Furthermore, tadalafil at a concentration of 1 mg/ml does not have an influence on sperm motility and sperm membrane permeability.

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31 EFFECT OF OMEGA-3, FATTY ACIDS ON OVARIAN TISSUE IN POLY CYSTIC OVARIAN (PCO) RATS

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(Presented By: Arash Khaki DVM PHD)

Introduction & Objective: Polycystic ovary syndrome (PCOS) is the most frequent cause of female infertility, affecting about 5 – 10% of women in age of procreation. To study the protective effects of omega-3 polyunsaturated fatty acid on experimental PCO induced by estradiol-valerate (PVA) in rats.

Methods: Wistar female rat (n=40) were allocated into three groups, control (n=10) and test groups (n=30), that subdivided into groups of 3 ,one group received omega-3 (60 mg/rat/orally/daily), second and third groups were induced PCO by single injection of estradiol-valerate (4mg/rat/IM), third group, was received omega-3 (60 mg/rat), for 60 consequence day. Animals were kept in standard conditions. In sixty day the ovarian tissues of rats in whole groups were removed and prepared to pathological analysis.

Results: Haemorrhagia, hyperemia and fibrosis were seen in pco groups, these side effects in groups that received omega-3 significantly decreased (p<0.05) in comparison to experiment groups and ovarian weights in both experimental and control group were similar (p<0.05).

Conclusion: Results revealed that administration of omega-3 significantly treated pco. This suggested that polyunsaturated fatty acid may be promising in PCO patients.

Keywords: Fibrosis, Omega-3, Ovary, Super oxide dismutase, PCO.

32 RECOVERY OF SPERM IN THE URINES FOLLOWING MASTURBATION IN 407 NON AZOOSPERMIC MALE PARTNERS OF INFERTILE COUPLES WITH HYPOSPERMIA ON A PREVIOUS SPERM ANALYSIS: PRELIMINARY DESCRIPTIVE RESULTS

Roger Mieussset, PhD, MD, Marie Walschaerts, PhD and Thierry Almont Male Sterility Center
(Presented By: Roger Mieussset, PhD, MD)

Introduction: Hypospermia, a reduced ejaculatory volume, can result from both a reduced production of the ejaculate bolus or by retrograde ejaculation occurring when semen is redirected to the urinary bladder.

Objectives: To evaluate the proportion of patients with hypospermia following hypospermia on a previous sperm analysis and to define a threshold indicating a total number of sperm in urines as abnormal.

Methods: After exclusion of any medical or surgical factor known to induce hypospermia or retrograde ejaculation, 407 non azoospermic male partners from infertile couples were included in this retrospective study (2000 – 2010). Cases were 245 men with a hypospermia (<2.0ml) on a previous sperm analysis. Controls were 162 men, without hypospermia on a previous sperm analysis, randomly selected at their first venue. After recommended sexual abstinence delay, all men were asked to successively void their bladder, collect semen by masturbation and then produce a new micturition that will be used for sperm research in urines (SRU). Sperm in urines were expressed as a ratio R=QU/QU+QE in which QU=total sperm count (TSC in millions) in urines and QE=TSC in ejaculate.
ABSTRACTS

**RESULTS**

28/407 men (6%) had no sperm present in urines (p=0.05 between cases and controls). In cases, ejaculate volume was still <2 ml in 146 (60%) and normal (≥2ml) in 99 (40%); but the last ones had a lower ejaculate volume than controls: mean [range]=2.7 [2.0 – 4.9] vs 3.7 [2.0 – 8.0] ml; p<0.001. The regression tree procedure applied to the 407 men determined 2 thresholds values for R: 0.76% and 7%. A value of R>7% was observed in 1 (<1%) control and 71 (29%) cases (QU=(mean±sd) 29±59, QE=74±97). A value of R<0.76% was observed in 70% of controls (QU=0.34±0.14, QE=156±167), and 29% of cases (QU=0.45±1.03, QE=145±197). Finally, 29% of controls (QU=3±5, QE=116±134) and 42% of cases (QU=4±8, QE=135±179) were within the 2 R values; in this range, controls differed (p<0.001 from cases only for volumes of urines (46±47 vs 29±32ml) and sperm (3.39±1.23 vs 1.85±0.83 ml).

**CONCLUSIONS**

As a previous hypospermia (<2 ml) was still present in 60% of men on the following sperm analysis, we suggest to associate SRU to the following sperm analysis. Results of SRU expressed as R = QU/QU+QE allow to define a threshold value of 7% above which a partial retrograde ejaculation has to be questioned. When R is >7% other etiological factors (exclusion of a seminal vesicle, ejaculatory dysfunction…) are to be looked for.

**33 SUCCESSFUL TESTICULAR SPERM RETRIEVAL IN KLINEFELTER ADOLESCENTS TREATED WITH AT LEAST ONE YEAR OF TOPICAL TESTOSTERONE AND AROMATASE INHIBITOR**

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(Presented By: Akanksha Mehta, MD)

**INTRODUCTION:** Testosterone replacement therapy (TRT) is advocated in adolescents with Klinefelter syndrome (KS) to promote linear growth, increase muscle mass, preserve bone density, and allow for development of secondary sexual characteristics. However, the impact of TRT on the fertility potential of KS adolescents is unknown. This study evaluated surgical sperm retrieval rates in KS adolescents on TRT at a specialized academic center.

**METHODS:** All subjects had cytogentic evaluation confirming a non-mosaic 47, XXY karyotype, and were treated with a combination of topical TRT and aromatase inhibitor (anastrozole 1 mg). Two centrifuged semen samples (3000g x 30min) were examined for each patient to detect sperm in the ejaculate. Microsurgical testicular sperm extraction (TESE) was performed following confirmation of azoosperma. All consecutive TESE procedures performed between 1/12 and 9/12 were analyzed. Demographic data, baseline and pre-operative serum T, FSH, and LH levels, dose and duration of TRT, testicular volumes, testicular histology patterns, and TESE outcomes were collected for each patient. Each TESE specimen was analyzed by two embryologists.

**RESULTS:** Nine subjects underwent TESE. Patient age ranged from 14 – 22 yrs (mean 15.6). Baseline serum T, LH, and FSH levels ranged from 40 – 350 ng/dL (mean 188), 0.6 – 25.1 mIU/mL (mean 9.4), and 1.37 – 25.1 mIU/mL (mean 20.4), respectively. Mean testicular volume was 3.9 cm³. On TRT, pre-op serum T, LH, and FSH levels ranged from 126 – 990 ng/dL (mean 690), 4.76 – 46.2 mIU/mL (mean 16), and 4.68 – 74.5 mIU/mL (mean 35.4), respectively. Duration of TRT prior to TESE varied between 1 and 5 years. Sperm were successfully retrieved in 7/9 cases (78%). With the exception of one patient, in whom only rare, non-motile sperm were identified, mean sperm concentration ranged from 0.1 to 2 x10⁶/ml, with a total sperm count between 0.01 and 2 x10⁶. No post-operative complications occurred. Testicular volume, age or duration of TRT did not predict sperm retrieval.

**CONCLUSION:** Testicular sperm was extracted and cryopreserved in 7/9 (78%) of KS adolescents treated with topical TRT and oral aromatase inhibitors for a period of 1 to 5 years. Use of topical TRT did not appear to suppress spermatogenesis. It is uncertain whether sperm retrieval rates in these young males would be higher or lower without TRT. Sperm cryopreservation should be discussed in all KS adolescents who are either receiving or considering initiating TRT.

**34 EFFECTS OF LOW DOSES OF SILDENAFIL ON SEMEN QUALITY**

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(Presented By: Sotiris Koukos, MD)

**INTRODUCTION AND OBJECTIVES:** Previous studies have demonstrated a beneficial effect of relatively large doses of sildenafil on semen parameters (BJU Int 2010, 106:1181). In this study we evaluate the effects of low doses of sildenafil on the standard parameters of semen analysis.

**METHODS:** Sildenafil (12.5 mg/day; group A) or L-carnitine (1000 mg/day; group B; positive control) were administered to 11 (group A) or 20 (group B) infertile men with oligoasthenospermia for 60 days. Another group of 20 infertile men with oligoasthenospermia (group C) served as a negative control group and received no pharmaceutical treatment. Standard variables of semen analysis (with three days of sexual abstinence) and peripheral serum levels of testosterone were evaluated in groups A and B before administrating the pharmaceutical agent in each of groups A and B. At the end of the experimental period (60 days), standard parameters of semen analysis and peripheral serum levels of testosterone were also assessed in groups A and B. The same semen and hormonal parameters were assessed in group C before and after the end of the experimental period (EP). Within each group, differences in quantitative variables were analyzed using the Wilcoxon test for paired observations. The groups were compared by one-way analysis of variance (ANOVA), and if there were significant differences by ANOVA, then Duncan’s multiple comparison test was used. A probability P less than 0.05 was considered to be statistically significant.

**RESULTS:** Within group A, within group B, and within group C, there were no significant differences in mean semen testosterone value at the end of the EP compared with that prior to the beginning of the EP. There were no significant differences in the mean values of sperm concentration (SC), percentage motile sperms (%MS), and percentage morphologically normal sperms (%MNS) among groups A, B, and C prior to the beginning of the EP. Within the group A, B, or C, there were no significant differences in the mean value of SC or %MNS prior to the EP compared with the respective mean value afterward. In contrast, within the group A, the mean value of %MS was significantly smaller before pharmaceutical treatment than afterward (after the end of the pharmaceutical treatment). Within group B, or C, there were no significant differences in the mean value of %MS prior to the EP compared with the respective mean value afterward.

**CONCLUSION:** It appears that daily low doses of sildenafil have a positive influence on sperm motility.
ABSTRACTS

35
FUNCTION OF HEN1 IN THE STABILIZATION OF PI RNAs DURING MAMMALIAN SPERMATOGENESIS AND MALE FERTILITY
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(Presented By: Shu Ly Lim, PhD)

Introduction: The Piwi-interacting RNA (piRNA) pathway is a RNA silencing pathway that represses the expression of gene and transposable elements (TE) in the gonads via binding of piRNAs to their complementary RNA targets. Mammalian piRNAs are 26 – 31 nt in length and are 2'-O-methylated at their 3’ termini. Although the biogenesis of piRNAs remains unclear, Hen1, a plant microRNA (miRNA) 2’-O-methyltransferase, is known to play an important role in piRNA stabilization via methylating the 2’OH at the 3’ termini of piRNAs. Deletion of hen1 in Zebrafish reduced piRNA content and led to an exonuclease-mediated shortening of the piRNAs that resulted in female sterility.

Methods: In order to understand the mechanism of mouse HEN1 on male fertility, we have generated a mouse model with a point mutation in the Hen1 ortholog that produced truncated and unstable Hen1 transcript. Hen1 mutant males are sterile. Homozygous mutant males produce greatly reduced numbers of sperm with round heads, many fail to spermiate and the epididymides are virtually devoid of sperm.

Results: Western and northern blots, demonstrated the presence of more than two HEN1 isoforms, however deletion of a 43kDA isoform contributes to the infertile phenotype. Real-time PCR and western blot showed that Hen1 is expressed in the new born testis with its expression peak in day 30 and adult, suggesting the presence of Hen1 in a wide range of spermatogenic cells and specifically high expression in spermatids.

Conclusion: Based on this data, we propose an important role of HEN1 in regulating pachytene piRNA biogenesis and the expression of numerous haploid germ cell mRNAs.

36
OXIDATIVE STRESS AND SPERM DNA DAMAGE: ROLE IN MALE INFERTILITY AND IMPACT OF LIFESTYLE AND OCCUPATIONAL FACTORS
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(Presented By: Monis Bilal Shamsi, MSc)

Introduction and Objectives: Sperm has dynamic and critical role in embryogenesis. Supraphysiological reactive oxygen species (ROS), decreased antioxidant, nuclear and mitochondrial DNA damage affect the embryonic viability and post natal health. This study was planned to investigate contribution of ROS, antioxidant capacity and sperm DNA damage in male infertility.

Methods: Male partners of 108 couples with idiopathic infertility and 64 fertile controls were included in study. ROS in neat semen was quantified by chemiluminescence, total antioxidant capacity (TAC) by ELISA and sperm DNA damage by comet assay. Statistical analysis was performed using MedCalc trial version.

Result: Mean ROS levels in infertile men (17673.62 RLU/min/20 million sperm) was significantly higher (p<0.05) as compared to controls (1289.42 RLU/min/20 million sperm). ROS levels in the infertile group range from 397 to 395678 RLU/min/20 million sperm whereas in controls ROS was from 178 to 10618 RLU/min/20 million sperm. Mean DFI in infertile men was 39.78, which is 2.26 times higher than average DFI in controls (17.57). Mean TAC levels in infertile men was 3.15 mM which was significantly lower (p<0.05) as compared to controls (6.95mM). Sperm DNA damage positively correlated (r=0.712; p= 0.019) with ROS and negatively correlated (r= −0.812; p=0.021) with TAC levels. Forty seven percent of infertile men having ROS and DFI higher than mean average of ROS and DFI of infertile group were smokers; however in controls this percentage was 34. Thirty eight percent of infertile men with ROS and DFI lower than the mean average of infertile group had regular physical exercises. Similarly, in controls 58% of men with low ROS and DFI than the average were regular in physical workout. The mean average of ROS and DFI in both infertile and controls was higher in men who were exposed to occupational toxins as pollutants, plastic fumes and high temperature.

Conclusion: The impact of sperm DNA damage as a result of, OS having a genetic background or OS which is stimulated by xenobiotic components due to occupational or lifestyle factors, may contribute to infertility. As ROS levels and sperm DFI were comparatively higher in smokers, exposed individuals, and in males with less physical activity; adopting healthy lifestyles (quitting smoking, consuming plenty of fruits/vegetables, yoga, meditation, moderate exercise) may improve their chances of pregnancy and delivering a healthy, live baby.
**ABSTRACTS**

**ELECTROEJACULATION IN PSYCHOCGENIC ANEJACULATION – A SINGLE-CENTER EXPERIENCE**
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University Medical Center Utrecht, Department of Urology
(Presented By: Timof.W. Soeterik, Bsc)

**Introduction:** Psychogenic anejaculation has been recognized as a cause of male subfertility. Electroejaculation (EEJ) may be of value in this specific subgroup of patients. However, little has been published on the subject. Our objective is to present the results of patients with psychogenic anejaculation who underwent EEJ at our center.

**Methods:** A retrospective chart analysis was performed of all EEJs carried out between January 1994 and January 2012. We collected data on pre-operative diagnosis of anejaculation, number of EEJs needed, sperm quality according to WHO-standards, pregnancies and delivery rates.

**Results:** In total, we identified 59 patients of whom 11 were diagnosed with psychogenic anejaculation. Of these 11, mean age at the time of first treatment with EEJ was 33.9 (SD 4.5) years. All patients received EEJ according to Seager under general anesthesia. A total of 51 electrostimulations were performed in these men. In ten out of the eleven patients the first attempt was successful, yielding enough sperm of sufficient quality for assisted reproductive techniques (ART). More stimulations were done within the context of ART or to obtain better quality. Unfortunately, one patient suffered from severe oligoasthenoteratospermia and no semen of sufficient quality could be obtained. The mean VCM (volume (mL) × concentration (sperm cells/mL) × percentage progressive motile cells / 100) of the sperm retrieved in the first electrostimulation was 27.2×106 (SD 42.2×106). The semen was used in a total of 34 intra-uterine insemination treatment cycles and 30 intracytoplasmatic sperm injection (ICSI) procedures. The mean age of the partner was 32.3 (SD 3.1) years. These artificial reproductive techniques (ART) resulted in nine pregnancies. Eventually, eight healthy children were born; one pregnancy resulted in an abortion.

**Conclusion:** EEJ is a suitable and effective treatment which can be used in men with psychogenic anejaculation. In most cases it is possible to collect semen of good quality in this specific patient population. The retrieved semen can be used successfully in an ART-treatment. In our study this had resulted in pregnancies and birth of healthy children in the majority of patients.

**MALE SEXUAL FUNCTION**

**THE RELATION OF CIRCUMCISION TO DISTAL PENILE SENSITIVITY**
Joon Yong Kim and P.B.M. Kim
Philip and Paul Medical Institution
(Presented By: Joon Yong Kim)

**Introduction and Objectives:** Circumcision may cause edema and histologic changes and there might be a decrease in sensitivity in the distal penis. This study aims to report the correlation between circumcision and a decrease in penile sensitivity.

**Results:** The average age of men having phimosis (22 cases) is 41 years old. The threshold from the distal penis and that from the proximal penis was 6.4 and 6.3. The average age of men (81 cases) who were circumcised is 39 years old. The threshold from the distal penis and that from the proximal penis was 5.6 and 6.1.

**Conclusion:** This study showed that the sensitivity that was expected to decrease turned out to be more sensitive on the distal area than on the proximal area. On the other hand, the men who were uncircumcised showed less sensitivity on the distal area than on the proximal area. It is assumed from the findings that circumcision would not have any influence on a decrease in sensitivity of the penis.

**VALIDITY AND RELIABILITY OF A SMARTPHONE APPLICATION FOR THE ASSESSMENT OF PENILE DEFORMITY IN PEYRONIE'S DISEASE**
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(Presented By: Ryan Hsi, MD)

**Objectives:** Available methods to evaluate men with Peyronie’s Disease (PD) are limited by the inability to accurately and reproducibly measure penile deformity. The purpose of this study was to evaluate the measurement performance of a smartphone application for the assessment of penile narrowing and curvature.

**Methods:** A smartphone application, UWPEN (Peyronie’s Examination Network), was developed for this purpose. To assess penile curvature angulation, 15 single cylinders of malleable prostheses were molded to varying curvature angles. Three blinded observers non-sequentially measured the angle of curvature for each prosthetic cylinder in triplicate using a protractor, goniometer, and UWPEN. To assess girth narrowing, six clay models of the penile shaft were constructed to represent conditions of normal, partial hourglass, circumferential hourglass, and pencil narrowing. Girth measurements were recorded as a ratio of minimum to maximum diameters using a ruler and UPEN in triplicate by the same blinded observers. Statistical analyses compared inter-test, interobserver, and intraobserver reliability using the interclass correlation coefficient (ICC). An ICC above 0.80 is considered to show high reliability among measurements.

**Results:** Inter-test reliability for angle measurements yielded an ICC for the 3 methods of 1.000. Separately, the ICC for UWPEN versus the goniometer and protractor was 0.999 and 0.999, respectively. The interobserver ICC for UWPEN, goniometer, and protractor was 0.998, 1.000, and 0.999, respectively. Inter-test reliability for girth narrowing measurements yielded an ICC of 0.991. The interobserver ICC for girth narrowing for UWPEN and the ruler was 0.978 and 0.986, respectively.
Conclusions: The measurement performance of UW PEN is comparable to and highly correlated with angle measurements obtained from the goniometer and protractor as well as with girth narrowing measurements obtained from a ruler. Measurements are reproducible among different operators. This instrument may provide an accurate, reliable, and widely accessible method to characterize and track PD over time as well as the mechanism to generate robust crowd-sourced research data.

40

INFLUENCE OF SCHWANN CELL DEGENERATIVE CHANGE IN DORSAL NERVE OF PENIS ON ERECTILE DYSFUNCTION IN AGING

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(Presented By: Prakash Seppan, PhD)

Introduction and Objectives: Aging related sexual and reproductive decline are main secondary complications and leading to poor quality of life in elderly population. Among these one of the main complications is erectile dysfunction (ED), which affects the sexual life. Aging related ED, as a result of reduced nitric oxide synthesis, collagen deposition, smooth muscle degeneration and vascular complications, deficiency of neurohormonal factors and increased oxidative stress. Among these factors the integrity of dorsal nerve of penis (DNP) is important for achieving and maintaining erection. Understanding the conduction, histologic and ultrastructural changes in DNP would be useful to address erectile decline in aging. To study the structural and functional alterations of DNP in ageing in relation to penile erection, using Wistar albino rat as experimental animal model.

Methods: Male Wistar albino rats were divided into two groups – Young (3 months) and Aged (24 – 28 months). Animals were subjected to hypo-thalamo-hypophysial-gonadal axis, nerve conduction velocity (NCV) and penile reflex study. Animals were euthanized and DNP were collected and tissue specimens were fixed with 2% glutaraldehyde and 4% paraformaldehyde for electron microscopy & light microscopy respectively. Osmium tetroxide fixed sections were used for histomorphometrical analysis. Fresh sections were used for immune-staining of the nNOS and histochemistry of NADPH diaphorous staining.

Results: Aged animal showed significant disturbance in hypo-thalamic-hypophysial-gonadal axis, degenerative changes including demyelination, reduced diameter and numerical density of myelinated fibres. Electron microscopic study showed vacuolization and indentation of the myelin sheath and Schwann cells degenerative change in aged DNP. Immuno-localization of the nNOS and the cofactor (NADPH diaphorous) were reduced in aged animal DNP. The nerve conduction velocity slow in aged rat DNP and concomitant poor penile reflex.

Conclusion: The present observations indicate that DNP demyelination through Schwann cells degeneration plays crucial role in aging induced erectile dysfunction. Significant contributions in impairment of the erectile function in aging related neuropathy involving nitregic / neuroparaxial degenerations in DNP are key players. Micro-anatomical and functional evaluations give new opportunity and useful information in evaluating therapeutic outcome in erectile dysfunction in animal models.

41

SHOCK WAVE THERAPY IN PATIENTS WITH PEYRONIE'S DISEASE – OUR EXPERIENCE

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(Presented By: Libor Zamecnik)

Introduction and Objectives: Etiology of this disease is not exactly clear. Prevalence of IPP has been increasing in the past ten years. Nowadays it is 6 – 10%. Plaque occurrence leads to penile dysfunctions. More than 50% of patients suffer from penile deformation in erection. It impacts their sexual life as well as the life of their partners. IPP therapy is divided into two groups: conservative (oral therapy, ultrasound and shock wave therapy – SWT) and surgical. SWT effect is erectile function improvement, plaque size, angulation and pain reduction. Retrospective assessment of success rate of the shock wave therapy to fibrous plaques in patients with Peyronie’s Disease.

Methods: Retrospective assessment of 40 patients treated between 2010 and 2012 at the Department of Urology, First Faculty of Medicine, Charles University and General University Hospital in Prague, Czech Republic. Parameters assessed: patient’s age, duration of the disease, type of primary treatment, plaque size and its change following shock wave therapy, disease symptoms, number of sessions and shock delivered and length of the follow-up. Dornier Compact Delta II machine was used, contact pressure 2, energy level C, shocks frequency 120 – 150/min, average number of shocks was 1350 (range 1200 – 1500). Therapy was performed on outpatient basis, with no anesthesia, ultrasound or manual focusing. Plaque size was measured by ultrasound before and after the therapy (minimum of 10 sessions). Penile pain and angulation was assessed by patients.

Results: Mean patient’s age was 58 years (range 31 – 74), mean disease duration was 22 months, medical therapy preceded in all patients (tamoxifen, vitamin E, intralesional verapamil) and one patient underwent treatment with laser combined with an ultrasound. Mean number of sessions was 15.2 (5 – 34), follow-up period was 4 – 20 months (mean of 12.6 months). All 25 patients reporting plaque pain before therapy had complete resolution (100%), reduction in plaque size was reported in 19 patients (47.5%) and there was an improvement in only 6 out of 30 patients (20%) with various degree of penile angulation. There were 5 minor complications (1 hematoma, 4 cases of lasting penile skin petechiae).

Conclusions: Shock wave therapy to fibrous plaques in Peyronie’s Disease is safe and applicable in patient with failed medical therapy. It has the fastest effect on subjective pain symptoms, with minimal change in plaques size. Penile angulation is the least changing parameter.
LONG-TERM CONTINUOUS TREATMENT WITH AVANAFIL PROMOTES RECOVERY OF ERECTILE FUNCTION IN A RAT MODEL OF POSTPROSTATECTOMY INDUCED ERECTILE DYSFUNCTION
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(Presented By: Ahmet Gokce, MD)

Introduction and Objectives: Surgical management of localized adenocarcinoma of the prostate is frequently associated with post-operative erectile dysfunction (ED). Several potential management strategies for penile rehabilitation have been evaluated with varying results. The objective of the current study is to evaluate whether avanafil is successful in preventing ED following bilateral cavernosal nerve crush injury (BCNI), a model for human erectile dysfunction after bilateral nerve sparing radical prostatectomy (BNSRP).

Methods: Seventeen Sprague-Dawley rats (300 – 350 g) were divided three groups: Sham group (n=5), BCNI exposed to no avanafil treatment (BCNI, n=6) or avanafil (BCNI + treatment, n=6). In the treatment group, avanafil was given orally in drinking water at a dose of 20 mg/day to each rat for four weeks beginning from the first day of BCNI. Rats in the sham and BCNI groups received drinking water alone. Four weeks following BCNI, animals underwent electrophysiologic assessment of erectile function by measuring intracavernosal pressure/mean arterial blood pressure (ICP/MAP) ratios.

Results: Daily oral treatment of avanafil resulted in significant improvements in ICP/MAP ratios compared to BCNI alone (34±5 vs. 19±1% for 2.5 V (p = 0.01); 49±4 vs. 27±3% for 5.0 V (p = 0.002); 59±3 vs. 40±7% for 7.5 V (p = 0.02)). Sham animals had an ICP/MAP ratio of 29±9, 50±5 and 71±4% at stimulation voltages of 2.5, 5.0 and 7.5 V, respectively. BCNI rats showed significant decreases in ICP/MAP compared to sham animals (p < 0.05), while avanafil treated rats were statistically similar to sham rates at all stimulation voltages except for 7.5 V (p = 0.02).

Conclusions: Continuous long-term avanafil treatment following BCNI resulted in restoration of erectile function in a rat model of postprostatectomy ED. Further validation of this study is required to assess its potential role in human penile rehabilitation therapies following BNSRP.

BOTULINUM TOXIN RESULTS IN DECREASED PROLIFERATION AND APOPTOSIS IN THE RAT BULBOUS SPONGIOSUM
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(Presented By: Sree Harsha Mandava)

Introduction and Objectives: Botulinum toxin is commonly utilized in urologic practice for several indications, including overactive bladder, neurogenic bladder and detrusor-sphincter dyssynergia, etc. Although recent studies have described botulinum toxin migration following intramuscular injection, minimal data is currently available regarding the effects of drug migration on adjacent tissues. We sought to examine whether the injection of botulinum toxin in rat bulbospongious muscle affects the mitochondrial protein Sirt3, and regulates intrinsic mitochondrial apoptosis and cell death.

Methods: 14 male Sprague-Dawley rats were divided into 3 groups and treated with single injection into the bulbospongious muscle: controls (saline), low dose (botulinum toxin A, 0.5 units), and high dose (botulinum toxin A, 1.0 unit). Rats were subsequently sacrificed at 4 weeks and the bulbouspognitive muscle harvested. Various analyses were performed to evaluate expression of Sirt3 (Western blot), α-tubulin (Western blot), NADPH oxidase levels (lucigenin chemiluminescence), and tissue apoptosis (TUNEL assay).

Results: Rats treated with botulinum toxin A demonstrated decreased levels of Sirt3 in the bulbospongious muscle compared to controls, with the high dose group experiencing the lowest expression. Using a quantitative Sirt3/α-tubulin ratio, the high dose group experienced the lowest Sirt3 protein levels (30%), compared to low dose (75%) and controls (100%), p<0.05 (see figure). NADPH oxidase activity was significantly increased in both the low dose (800 relative light units [RLU]) and high dose (1500 RLU) groups compared to controls (400 RLU). Using TUNEL categorical scores, apoptosis was identified more frequently in low dose (10) and high dose (15) treatment groups, compared to controls (5).

Conclusion: Injection of botulinum toxin A into the rat bulbospongious muscle results in decreased Sirt3 expression and increased NADPH oxidase activity that may affect ATP production and cause oxidative stress. This results in increased tissue destruction and cell death.
44

HUMAN PROSTASOMES EXPRESS GLYCOLYTIC ENZYMES WITH CAPACITY FOR ATP PRODUCTION

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(Presented By: Göran Ronquist)

Introduction and Objectives: Prostasomes transmit signaling complexes between acinar epithelial cells of the prostate and sperm cells. Most prostasomes have a diameter of 30 – 200 nm with a surrounding membrane bilayer. Using a selected proteomic approach, it became increasingly clear that prostasomes harbor distinct subsets of proteins that may be linked to adenosine triphosphate (ATP) metabolic turnover that in turn might be of importance in the role of prostasomes as auxiliary instruments in the fertilization process. To map a possible physiological role of the ATP-forming capacity of prostasomes.

Methods: Prostasomes were purified from human seminal plasma by differential centrifugation steps including preparative ultracentrifugation and gel chromatography. Pooled elution of prostasomes was top-loaded on a sucrose gradient and the band on 1.5M sucrose was collected and prostasomes were concentrated to 2mg/mL by a BCL kit. For evaluation of ATP, a luciferase based ATP estimation kit (InVitrogen) was used. Glucose, fructose and glyceraldehyde 3-phosphate were used as energy-yielding substrates.

Results: The identified enzymes in their prostasomal context were operational for ATP formation when supplied with substrates. The net ATP production was low due to a high prostasomal ATPase activity that could be partially inhibited by vanadate that was utilized in order to profile the ATP forming ability of prostasomes. Glucose and fructose were equivalent as glycolytic substrates and the enzymes involved were apparently surface-located on prostasomes, since an alternative substrate not being membrane-permeable (glyceraldehyde 3-phosphate) was operative, too.

Conclusions: Prostasomes have capacity for extracellular ATP formation. The exact role of this ATP-forming ability of prostasomes is not known but extracellular ATP may be an important substrate for diverse protein kinase reactions.
INCIDENCE OF PROSTATE CANCER IN HYPOGONADAL MEN ON LONG-TERM TREATMENT WITH TESTOSTERONE UNDECANOATE INJECTIONS

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Introduction: There are concerns regarding the safety of testosterone treatment, particularly in elderly men.

Methods: Registry studies of 850 men with testosterone levels ≤12.1 nmol/L from three German centers. Patients received testosterone undecanoate for up to 60 months.

Results: In cohort A (mean age: 60.6; Haider), PSA increased from 1.77±0.96 to 1.82±0.96 ng/ml (p<0.0001). Prostate volume increased from 28.51±11.2 to 30.23±12.4 ml (p<0.0001). 3/255 patients were diagnosed with prostate cancer at 18 weeks of treatment. The proportion was 1.18% with an incidence of 30.334 per 10,000 patient-years. In cohort B (mean age: 58; Yassin), PSA increased from 0.86±0.57 to 1.38±0.49 ng/ml (p<0.0001). Prostate volume increased from 27.9±8.15 to 36.98±7.22 ml (p<0.0001). 6/261 patients were diagnosed with prostate cancer. The proportion was 2.3% with an incidence of 54.5 per 10,000 patient-years. All patients underwent radical prostatectomy. In cohort C (mean age: 42; Zitzmann), PSA increased from 1.8±0.5 to 1.9±0.4 (p<0.001). Prostate volume increased from 16.1±5.2 to 19.7±5.4 ml (p<0.001). No patient was diagnosed with prostate cancer. The International Prostate Symptom score (IPSS) improved from 6.73±2.83 (p<0.0001) in cohort A and from 10.35 to 6.58 (p<0.0001) in cohort B. Residual bladder volume declined from 46.61 to 19.7±5.4 ml (p<0.001). No patient was diagnosed with prostate cancer. The proportion was 2.3% with an incidence of 54.5 per 10,000 patient-years. All patients underwent radical prostatectomy. In cohort C (mean age: 42; Zitzmann), PSA increased from 1.8±0.5 to 1.9±0.4 (p<0.001). Prostate volume increased from 16.1±5.2 to 19.7±5.4 ml (p<0.001). No patient was diagnosed with prostate cancer. The International Prostate Symptom score (IPSS) improved from 6.73±2.83 (p<0.0001) in cohort A and from 10.35 to 6.58 (p<0.0001) in cohort B. Residual bladder volume declined from 46.61 to 19.7±5.4 ml (p<0.001). No patient was diagnosed with prostate cancer. The proportion was 2.3% with an incidence of 54.5 per 10,000 patient-years. All patients underwent radical prostatectomy.

Conclusions: The PLCO trial reported an incidence of 116 per 10,000 patient-years (Andrle, NEJM 360(13):1310 – 9), the ERSPC trial 96.6 (Schröder, NEJM 366(11):981 – 90). In our studies, the incidence of prostate cancer does not suggest an increased risk in hypogonadal men on long-term testosterone treatment.

WHERE SHOULD INTRATESTICULAR RESISTIVE INDEX BE MEASURED?

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Introduction: Resistive Index (RI) calculated by Spectral Doppler ultrasound of the testis, is a non-invasive indicator of the intratesticular microcirculation. The current body of literature has shown that RI is related to spermatogenesis, with an elevated RI indicating dyspermia. However, the literature does not specify where in the testis the RI is best measured. It is the goal of this study to evaluate measurement of RI from multiple areas in the testes to determine if significant differences exist.

Methods: A retrospective review of all testicular ultrasounds performed at our clinic for one year (September 2011 through August 2012) yielded 214 patients and 418 testicles (10 men with solitary testis). Spectral Doppler interrogation of a single centripetal or recurrent rami artery from the upper, middle and lower portions of each testis was performed using a BK medical Flex focus ultrasound with an 18 MHz linear array transducer by a single sonographer.

Results: The average RI for the right was 0.56 and for the left was 0.56. When comparing the right and left testis there was no statistical difference (p-value of 0.86). In the right testis, there was no statistical difference when comparing the upper and lower values (average RI 0.56 and 0.56, respectively) to the mid-testis (average RI 0.56) with p-value of 0.68 and 0.79, respectively. There was also no statistical difference when comparing the right upper to right lower testis, p-value 0.48. In the left testis, there was no statistical difference when comparing the upper and lower values (average RI 0.56 and 0.56, respectively) to the mid-testis (average RI 0.56) with p-value of 0.95 and 0.70, respectively. There was also no statistical difference when comparing the left upper to left lower testis, p-value 0.73.

Conclusion: Spectral Doppler ultrasound is a safe, non-invasive technique that adds unique real-time information about intratesticular microvasculature and testicular function. This study finds that RI measurements are not statistically different when measured from the upper, mid, or lower testis, indicating that RI can be measured from any area in the testis with equivalent results. The process of identifying an intratesticular artery in the upper, mid, and lower pole of each testis can be time consuming; therefore, the ability to use a single measurement of RI from anywhere in the testis may encourage more Urologists to obtain this measurement as an independent marker of testicular function.
**ABSTRACTS**

### 48

**IN SEARCH OF DE NOVO STEROID BIOSYNTHESIS IN HUMAN PROSTATE CELL LINES AND BIOPSIES**

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(Presented By: Monica Sakai, DVM, PhD)

**Introduction and Objectives:** Prostate is known to metabolize steroids, mainly circulating testosterone into 5α-dihydrotestosterone. These androgens have a permissive role in the development of prostate cancer (PCa) and benign prostate hyperplasia (BPH); but potentially there are other sources of androgens that contribute in these processes. To evaluate the ability of human prostate to synthesize de novo steroids we examined the expression of key enzymes and proteins involved in steroid biosynthesis and metabolism.

**Methods:** Normal WPMY-1 and WPE1-NA22, hyperplasia BPH-1 and cancer PC-3 and LNCaP cell lines were used as well as BPH (11), Stage 0 (15) and PCa (70) specimens. Gene expression was detected by QPCR and steroid biosynthesis was assessed by radiometric HPLC.

**Results:** All cell lines express HMGCoA reductase, the rate-limiting step in cholesterol biosynthesis, whereas the mitochondrial translocator protein TSPO and cholesterol side chain cleavage enzyme CYP11A1, first steps in steroidogenesis, were found only in WPMY-1, BPH-1 and LNCaP. The enzymes involved in androgen formation (3βHSD1, 3βHSD2 and CYP17) were not found in most of prostate cell lines. Only the normal cells were found to express CYP19A1 while all cells expressed HSD17B5, involved in estrogen and testosterone formation, respectively. Interestingly, the expression of the steroid metabolizing enzyme SRD5A1 was found in all cells although SRD5A2 was absent. Despite the presence of key steroidogenic proteins, WPE1-NA22 and BPH-1 cells were unable to synthesized de novo steroids from the radio labeled precursor mevalonate. All human prostate specimens expressed TSPO, STAR, CYP11A1 and SRD5A1/2. The expression of 3βHSD1/2, CYP17, HSD17B5 and CYP19A1 in human biopsies was distinct to the profile observed in cell lines and indicated the lack of a continuous metabolic pathway. CYP19A1 and 3βHSD1/2 are not expressed in all specimens but they have similar % of expression among the diseases analyzed. Association analysis indicated that majority of BPH (90.9%) and PCa (83.1%) contained CYP17A1, compared to Stage 0 (46.7%).

**Conclusions:** These studies (i) question the use of prostate cell lines to study endogenous steroid synthesis, (ii) demonstrate that human biopsies express key steroidogenic enzymes and potentially synthesize de novo steroids, and (iii) identify CYP17A1 as a key enzyme to be used for patient stratification and treatment in BPH and castration-resistant prostate cancer.

**Funding:** Ferring and MITACS.

### 49

**COMPREHENSIVE GENOMIC AND PROTEOMIC PROFILING OF SPERM IN COUPLES UNDERGOING IVF TREATMENT**

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University of Utah

(Presented By: Luke Simon, PhD)

**Introduction and Objective:** Infertility affects one in six couples, with dysfunctional sperm being one of the most common causes. Conventional semen analysis lacks power as a prognostic test for assisted reproductive treatment (ART). Variations in sperm proline expression and sperm DNA integrity are associated with male infertility. In recent years, sperm DNA testing is increasingly recognised as a useful indicator of male fertility potential however, studies using different sperm DNA testing methods have showed conflicting results. To determine the usefulness of sperm DNA testing and proteomic analysis of sperm as a prognostic test for ART success.

**Methods:** Sperm DNA damage, histone retention and protamine content in semen of 229 couples undergoing IVF treatment were compared with semen parameters, fertilization rates, embryo and blastocyst quality and pregnancy outcomes. Sperm DNA damage was measured by the alkaline Comet, SCFA and TUNEL assays. Histone retention was measured by aniline blue staining. Protamines were extracted from 10x106 sperm and expressed as protamine 1 (P1), protamine 2 (P2), total P1+P2 contents and P1/P2 ratio.

**Results:** DNA damage measured by TUNEL and SCFA were associated with semen parameters but there was no correlation between semen parameters and Comet assay. Protamine ratio was associated with count, morphology, maturity, and blastocyst quality. Histone retention was associated with sperm DNA damage, embryo quality and clinical pregnancies. IVF fertilization rate was associated with DNA damage measured by Comet and TUNEL assays. Embryo quality was associated with DNA damage measured by Comet assay. Implantation rate was associated with DNA damage measured by Comet and TUNEL assays. The mean percentage of sperm with DNA damage was significantly higher in sperm from non pregnant couples (n = 100) compared with that from pregnant couples (n = 129) measured by TUNEL assay (8.79±0.56 versus 15.04±1.16; P<0.001) and the mean percentage of sperm without DNA damage was higher in pregnant couples compared with non pregnant couples measured by alkaline Comet assay (55.86±2.29 versus 72.79±2.49; P<0.001). However, there was no association between clinical pregnancies and DFI measured by SCFA and sperm DNA integrity are associated with male infertility. In recent years, sperm DNA testing is increasingly recognised as a useful indicator of male fertility potential however, studies using different sperm DNA testing methods have showed conflicting results. To determine the usefulness of sperm DNA testing and proteomic analysis of sperm as a prognostic test for ART success.

**Methods:** Sperm DNA damage, histone retention and protamine content in semen of 229 couples undergoing IVF treatment were compared with semen parameters, fertilization rates, embryo and blastocyst quality and pregnancy outcomes. Sperm DNA damage was measured by the alkaline Comet, SCFA and TUNEL assays. Histone retention was measured by aniline blue staining. Protamines were extracted from 10x106 sperm and expressed as protamine 1 (P1), protamine 2 (P2), total P1+P2 contents and P1/P2 ratio.

**Results:** DNA damage measured by TUNEL and SCFA were associated with semen parameters but there was no correlation between semen parameters and Comet assay. Protamine ratio was associated with count, morphology, maturity, and blastocyst quality. Histone retention was associated with sperm DNA damage, embryo quality and clinical pregnancies. IVF fertilization rate was associated with DNA damage measured by Comet and TUNEL assays. Embryo quality was associated with DNA damage measured by Comet assay. Implantation rate was associated with DNA damage measured by Comet and TUNEL assays. The mean percentage of sperm with DNA damage was significantly higher in sperm from non pregnant couples (n = 100) compared with that from pregnant couples (n = 129) measured by TUNEL assay (8.79±0.56 versus 15.04±1.16; P<0.001) and the mean percentage of sperm without DNA damage was higher in pregnant couples compared with non pregnant couples measured by alkaline Comet assay (55.86±2.29 versus 72.79±2.49; P<0.001). However, there was no association between clinical pregnancies and DFI measured by SCFA (14.93±1.65 versus 21.79±1.16; P=0.379).

**Conclusions:** Alterations in sperm nuclear protein affects sperm DNA integrity. This study shows a significant association between sperm DNA damage and ART outcomes.
50 INVESTIGATION ON THE VARIATION OF SEMEN PARAMETERS IN SEQUENTIALLY COLLECTED HUMAN SEMEN SPECIMENS FOR INTRAUTERINE INSEMINATION

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(Presented By: Amjad Hossain, PhD)

Introduction and Objectives: Intrauterine insemination (IUI) involves insemination of laboratory processed sperm into uterus synchronized with ovulation. Usually one insemination coordinated with ovulation is performed in a single treatment cycle. However, depending on the patient’s clinical condition, the physician may decide sequential multiple inseminations. In the present study we investigated the variation in semen quality when IUI is accomplished with 2 consecutive semen specimens in a treatment cycle.

Methods: Retrospective analysis of the laboratory data pertaining to IUI cases (n=23) with no apparent male factor and which involved 2 sequential inseminations in each treatment cycle were performed. All males used the same collection room and same collection method (masturbation) for producing the semen. Volume, count, motility, motility grade, forward progression, total motile sperm in the sample, and sperm morphology were assessed before and after column processing of the semen. Sperm were recovered from semen using SpermCare gradient column (In Vitro Care Inc) administering the same isolation protocol. Semen analysis was performed following WHO manual 4th edition.

Results: The abstinence time for the 1st sample ranged between 3 to 6 days while it was always 1 day for the 2nd one. The 1st and 2nd samples exhibited volume (ml) 2.5±1.4 and 1.8±1.2, concentration (millions/ml) 53±27 and 42±25, motility (%) 55±14 and 51±10, motility grade (scale of 1–4) 3.3±0.8 and 3.4±0.7, forward progression (%) 86±7 and 79±9, total motile sperm (millions) in the sample 76±69 and 38±36, respectively. The post wash motility in 1st and 2nd specimen was 80±12 and 74±17, and motility grade was 3.7±0.5 and 3.7±0.6, respectively. The sperm recovery rate was 25% and 33% in 1st and 2nd specimens. The 1st and 2nd specimens did not show difference in sperm morphology.

Conclusion: The 2nd semen was different from the 1st one only by reduction in semen volume and sperm concentration. Differences in abstinence time between the 2 specimens could be the cause of such variation. While due to such a short gap (1 day) between the 1st and 2nd specimen collection, both the semen samples probably represented the same sperm pool (spermatogetic wave) and thus the differences in sperm related semen parameters were lacking between the sequentially collected semen samples.

Funding: University Fertility Center, University of Texas Medical Branch at Galveston.

51 CHARACTERIZATION OF SUMOYLATED PROTEINS IN HUMAN SPERM

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(Presented By: Sara Marchiani, PhD)

Introduction and Objectives: SUMOylation is a post-translational protein modification involved in the regulation of essential cell functions. Our group found several SUMO-1 and SUMO-2/3ylated proteins in human ejaculated spermatozoa (Marchiani et al. 2011). We showed that SUMO-1 is mainly present in live spermatozoa and the percentage of SUMOylated spermatozoa was inversely correlated with total and progressive motility. By immunofluorescence and electron microscopy, we demonstrated that SUMOylated proteins are mainly located in the nucleus and in the midpiece. To better understand the role of this protein modification in sperm we aimed to characterize possible target proteins of SUMO-1. In particular, we evaluated RanGap-1 (Ran GTPase-activating protein 1) one of the main target of SUMO in somatic cells, DRP1 (Dynamin-related protein 1), whose SUMOylation in somatic cells provokes alterations of mitochondrial functions, and Topoisomerase II alpha, necessary for chromatin condensation and demonstrated to be a target of SUMOylation in germ cells.

Methods: By using immunoprecipitation/western blot analysis, immunofluorescence and immunofluorescence fluorescence we determined the occurrence of SUMOylation of RanGap-1, DRP1 and Topoisomerase II and, subsequently, their relative localization in sperm.

Results: By immunoprecipitation both with anti-SUMO-1 and with anti-RanGap-1 antibodies, we demonstrated that RanGap-1 is SUMO-1ylated in human sperm. With the same strategy, we showed that DRP1 is SUMO-1ylated and that the SUMO modified protein is found at higher levels in sperm pools from asthenospermic men respect to normospermic. By confocal microscopy we observed that the co-localization between SUMO-1 and RanGap-1 and between SUMO-1 and DRP1 are mainly found in the neck area. In addition, we also demonstrated the co-localization between SUMO-1 and Topoisomerase II in the sperm nucleus.

Conclusion: We identified RanGap-1, DRP-1 and Topoisomerase II as targets of SUMOylation in human sperm. Our data (Marchiani et al, 2011, present study) suggest that SUMOylation could play different roles in human sperm functions and the characterization of target proteins is fundamental to characterize such roles. In particular the higher levels of SUMOylated DRP1 in asthenospermic subjects, suggests that alterations in mitochondrial function due to SUMO-modified DRP1 may result in decreased sperm motility whereas sumoylation of RanGap may play a role in silencing gene translation.
CATSPER CALCIUM CHANNELS IN HUMAN SPERMATOZOA AND THEIR ROLE IN RESPONSIVENESS TO PROGESTERONE (P)
Lara Tamburrino, PhD, Sara Marchiani, PhD, Marta Cambi, PhD, Student, Monica Muratori, PhD, Gianni Forti, Professor and Elisabetta Baldi, Professor
Department of Clinical Physiopathology, University of Florence
(Presented By: Lara Tamburrino, PhD)

Introduction: CATSPER is a family of sperm-specific calcium channels activated by P in human spermatozoa, and indicated as putative P sperm receptors (Strunker et al, 2011; Lishko et al, 2011). KO mice for CATSPER channels are infertile due to severe defects in sperm motility. The aim of this study is to investigate whether these channels are involved in human sperm motility and P-stimulated acrosome reaction (AR).

Methods: Occurrence of CATSPER has been investigated by Western blot analysis and flow cytometry using an antibody against CATSPER1. Sperm motility has been evaluated in swim up selected spermatozoa by CASA (Hamilton Thorn). AR has been evaluated by FITC-labelled lectin in live spermatozoa.

Results: Western blot analysis demonstrated the presence of 3 major bands corresponding to CATSPER1, 2 and 3 – 4. By immunofluorescence we observed that channels are mainly located in the principal piece of the tail. By flow cytometry higher levels of CATSPER were found in swim up selected spermatozoa respect to unselected (50.9±16.6 vs 23.4±10.7, n=6, p=0.01). To investigate the role of CATSPER channels in human sperm motility parameters, we evaluated the effects of the specific inhibitor NNC55-0396 (10 and 20 uM) and the non specific inhibitor mibefradil (30 and 40 uM) on swim up selected spermatozoa (n=13). Both compounds significantly inhibited several motility-related parameters (VAP, VCL, VSL, BCF and STR). No significant effects of the different compounds were observed on sperm viability. P (at pM and uM concentrations) did not show any significant effect on sperm motility parameters. Next, we evaluated the effect of mibefradil and NNC55-0396 on P (10 uM)-stimulated AR in swim up selected human sperm (n=11). Mibefradil at 30 uM was ineffective, whereas a 50% inhibition was observed at 40uM. Conversely, NNC55-0396 compound, tested at 10uM concentration, inhibited P-induced AR of 70%.

Conclusion: These results indicate that CATSPER calcium channels are involved in human sperm motility and P-induced AR. In light of a recent study (Jin et al, 2011) demonstrating that physiological AR occurs during transit in the cumulus matrix of the oocyte (where P is present at uM concentrations) before sperm attachment to the zona pel lucida, our data suggest that CATSPER may be considered a possible molecular target for the development of novel therapeutic strategies for male infertility as well as for male-directed contraception.

INTRODUCTION AND METHODS

MICRONUTRIENT SUPPLEMENTATION INTAKE FOR 3 MONTH SIGNIFICANTLY INCREASES SPERM-HYALURONAN BINDING ASSAY VALUE COMPARED TO CONTROL GROUP

Erik Huber, FEBU, Florian Bodner Cand med¹, Markus Lipovac², Alexander Schütz³ and Martin Imhof Univ-Doz Prim²
¹Medical University of Vienna; ²Department for Obstetrics and Gynecology, Landesklinikum Weinviertel, Korneuburg, Niederösterreich, Austria; ³Adebar Wunschkinderklinik, Wiener Neustadt, Niederösterreich, Austria
(Presented By: Erik Huber, FEBU)

Introduction and Objectives: Sperm DNA fragmentation index proves to be an important factor in idiopathic male infertility and can easily be determined by means of sperm-hyaluronan binding assay (sperm-HBA). Recent publications discuss an influence of micronutrients on sperm quality. The aim of the study was to evaluate the effect of a non-prescription nutraceutical containing eight micronutrients on sperm-HBA among males with idiopathic sub-/infertility.

Methods: A total of 67 sub-fertile males were invited to participate and take two daily capsules of the active compound for a three month period between the first and the follow-up semen analysis. Each capsule contained L-carnitine, L-arginine, zinc, vitamin E, glutathione, selenium, coenzyme Q10 and folic acid (Profertil®). Sub-fertile men receiving no active treatment in same time period served as controls (n=40). Main outcome measure was change in sperm-HBA after 3 months.

Results: HBA index significantly increased after 3 months of treatment with the active compound, from a median baseline value of 56.0% to 74% (p<0.05). This was significantly higher than the value observed for the control group which displayed a net 69.5% decrease to 64.5% (p=0.083).

Conclusion: Sperm-HBA indicating sperm DNA fragmentation significantly increased in sub-fertile men after treatment with the active micronutrient compound as compared to controls.

IMMUNOREACTIVE SPERM ANTIGENS RECOGNIZED BY ANTISPERM ANTIBODIES OBTAINED FROM POLISH AND CZECH INFERTILE POPULATIONS – PROTEOMIC ANALYSIS

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(Presented By: Maciej Kurpisz, MD, PhD)

Introduction: Approximately 5 – 10% of infertile population reveals immunological background. Strongly reactive sperm auto-(males) and isoantibodies (females) cannot be overcome by modern methodology of assisted reproduction (ART) while blocking development of early embryo. Therefore immunoreactive sperm antigens that drive humoral immune response must be characterized in order to create a molecular platform for diagnosis, prognosis and treatment of cases with reproductive failure.

Methods: Polyclonal antisperm antibodies were contained in sera and seminal plasma samples derived from males and females originating from immunologically infertile couples of Polish and Czech populations. Biological samples were screened for antisperm antibodies (AsA) by immunobead-binding tests (IBT) and tray agglutination tests (TAT,) respectively for Polish and Czech groups. Sperm antigenic extracts were applied by using 2-D Sample Prep for Membrane Proteins. 2-D electrophoresis was performed by using isoelectric gradient and then by molecular weight in SDS gel. Immunoblotting was performed by first using polyclonal AsA (and relevant control sera) and then chemiluminescence. Peptides contained in immunoreactive spots were subjected to silver staining then isolated from gels and identified by liquid chromatography and mass spectrometry (LC-MS). The data were next processed with Mascot Distiller software and obtained peak lists were used to search the non-redundant protein database of National Center for Biotechnology Information (NCBI).

Results: Altogether 74 sperm entities have been detected by applied technology. Excluding spots/proteins detectable by control sera we found group-specific immunoreactive entities – 15 for Polish and 24 for Czech populations (and 7 overlapping). Out of this library we have classified 3 entities for Polish and 4 for Czech groups, specific for reproduction. Altogether 9 entities were found for the first time in human sperm proteome and 2 unknown proteins were revealed. Two most common entities were found to belong to heat shock proteins as well as fumarase (recognized in both cohorts of ethnic origin) were most often detected.

Conclusion: Methods of antisperm antibodies screening do not affect the effectiveness of sperm proteomic resolution. Two most common encountered sperm specificities seems to present biomarker value but they must be confronted with history of infertility, its treatment and final reproductive outcome.
Both CoCl2 induced hypoxia and 8-Br-cAMP, a cAMP analogue, enhanced HIF-1α protein activity and subsequently an increase in VEGF production. Progesterone was estimated by Radioimmunoassay (RIA) as per WHO guidelines. The study also compares the mechanistic pathways followed by both CoCl2 induced hypoxia and gonadotropins in regulating testicular functions.

Methods: MA-10 cells were cultured in Waymouth MB 752/1 medium, supplemented with 15% heat inactivated horse serum. VEGF protein in the cell culture supernatant was measured by a commercial kit from R & D systems that measures VEGF164 protein. Progesterone was estimated by Radioimmunoassay (RIA) as per WHO guidelines.

Results: Both CoCl2 induced hypoxia and 8-Br-cAMP, a cAMP analogue enhanced HIF-1α protein activity and subsequently an increase in VEGF secretion. The study investigated the role of induced hypoxia in regulating VEGF production and steroidogenesis in mouse Leydig tumor cell derived MA-10 cell cultures. The study also compares the mechanistic pathways followed by both CoCl2 induced hypoxia and gonadotropins in regulating testicular functions.

Introduction and Objectives: Testicular temperature and oxygen tension are much lower than the core body. The study investigates the role of induced hypoxia in regulating VEGF production and steroidogenesis in mouse Leydig tumor cell derived MA-10 cell cultures. The study also compares the mechanistic pathways followed by both CoCl2 induced hypoxia and gonadotropins in regulating testicular functions.

Conclusions: Hypoxia has an action and mechanism of action similar to that of gonadotropins on VEGF production, whereas they have contrasting effect on steroidogenesis. This study suggests that hypoxia could be as important as gonadotropins in regulating Leydig derived cells, maybe, even the Leydig cells.
ABSTRACTS

Results: By bioinformatics, we identified a total of 39 HIF-1α target genes known to be expressed in both human and mouse testes. Of which, Miwi2 was found to be significantly up-regulated by hypoxia. The immunohistochemical staining demonstrated that HIF-1α and Miwi2 proteins were co-localized in interstitial Leydig cells, spermatogonia and spermatocytes in mouse testes. Silencing of HIF-1α attenuated the Miwi2 expression under hypoxia, whereas overexpression of HIF-1α increased Miwi2 expression under normoxia, suggesting that the regulation of Miwi2 expression by hypoxia is mediated by HIF-1α.

Conclusion: Given that Miwi2 has been shown to be essential for piRNA-mediated retrotransposon silencing in male germline, the upregulation of Miwi2 by hypoxia suggests an important mechanism essential for normal male germline development.

60 DEEP SEQUENCING IDENTIFIES ALTERED MiRNA, PiRNA AND ENDO-SiRNA PROFILES IN PATIENTS WITH DIFFERENT TYPES OF NON-OBSTRUCTIVE AZOOSPERMIA
Hui Tian¹ and Fei Sun³
¹School of Life Sciences, University of Science and Technology of China, Hefei, China; ³School of Life Sciences, University of Science and Technology of China

Introduction and Objectives: Infertility is a worldwide reproductive health problem which affects 10% – 15% of couples. Half of the cases are due to male factors. Small regulatory RNAs have recently emerged as key regulators of eukaryotic gene expression. microRNAs (miRNAs) generally function in post-transcriptional gene silencing in both somatic and germline cells, while Piwi-interacting RNAs (piRNAs) and endogenous siRNAs (endo-siRNAs) mainly control gene and transposon expression in the germline.

Methods: Here, we performed deep sequencing to determine small RNA populations in the testis of normal controls and of non-obstructive azoospermia (NOA) patients with spermatogonia arrest (Spg arrest), spermatocyte arrest (Spc arrest) and hypospermatogenesis. We identified 5, 24 and 4 down-regulated miRNAs and 110, 395 and 337 up-regulated miRNAs in patients’ testicular biopsies with Spg arrest, Spc arrest and hypospermatogenesis compared with normal controls, respectively.

Results: Negative correlations were found between expressions of altered miRNAs and their targets in human testis. On the other hand, 31 up-regulated novel miRNAs were identified in infertile testes. In addition, we sequenced large numbers of piRNAs. We discovered four types of piRNA clusters based on whether they mapped to both sense and antisense strands and how the mapped regions overlapped, and found out that piRNAs from normal control testes were mainly from the type 1 and type2 clusters (piRNAs mapped to both strands), while in Spg arrest testis, the number of type 4 piRNA cluster (piRNAs mapped to only the sense strand) was increased. Also, compared to normal controls, 15 and 91 down-regulated piRNA clusters were identified in patients with Spg arrest and Spc arrest, which might be caused by defect of piRNA pathway. Furthermore, endo-siRNAs clusters were altered in different types of NOA patients, including 4, 38 and 4 down-regulated and 9, 27 and 59 up-regulated endo-siRNA clusters in testis of Spg arrest, Spc arrest and hypospermatogenesis, respectively.

Conclusion: These endo-siRNAs were predicted to target hundreds of transcripts potentially, many of which were involved in regulation of spermatogenesis, hormone secretion or cell cycle control. This is the first report discovered the altered expression of small non-coding RNA in testicular tissues of patients with different types of NOA. Our results indicate an important role of small RNAs in regulating spermatogenesis in human males.

Monday, April 15, 2013
11:00 a.m. - 12:30 p.m.
Poster Session II
Location: Regency West 4 – 6

ANDROGENS / ENDOCRINOLOGY

61 COMPARISON OF CELL TYPES IN THE RAT LEYDIG CELL LINEAGE AFTER ETHANE DIMETHANESULFONATE TREATMENT
Jingjing Guo, MD¹, Hongyu Zhou, MS², Bing-Bing Chen, MD², Zhi-Jian Su, PhD³, Gui-Min Wang, PhD³, Claire Q.F. Wang, PhD³, Qingquan Lian, PhD³, Yunfei Xu, MD² and Renshan Ge, PhD³
1Institute of Reproductive Biomedicine; 2Department of Pharmacology, School of Pharmacy, Wenzhou Medical College; 3Institutes of Life and Health Engineering, Jinan University; “The Second Affiliated Hospital of Wenzhou Medical College; “Department of Urology, the Affiliated 10th People’s Hospital of Tongji University

Introduction and Objectives: Rat Leydig cells regenerate after single administration of ethane dimethanesulfonate (EDS). However, the cell types in the Leydig cell lineage after regeneration have not been purified for further analysis. The objective of this study was to purify the cells in the Leydig cell lineage after regeneration and compare their steroidogenic capacity.

Methods: Regenerated progenitor (RPLCs), immature (RILCs), and adult Leydig cells (RALCs) were isolated from testes 21, 28 and 56 days after EDS treatment, respectively. Production rates for androgens including androsterone and 5α-androstane-17β, 3α-diol (DIOL), testosterone and androstenedione were measured in RPLCs, RILCs and RALCs in media after 3 h in vitro culture with 100 ng/ml luteinizing hormone. Steady state messenger RNA levels of steroidogenic enzymes and their activities were measured in freshly isolated cells.

Results: Compared to adult Leydig cells (ALCs) isolated from normal 90-day-old rat testes, which primarily produce testosterone (69%), RPLCs and RILCs primarily produced androsterone (70%) and DIOL (70%), respectively. Leydig cells isolated from testes 56 days post EDS showed equivalent capacity of steroidogenesis to ALCs and primarily produced testosterone (72%). RPLCs has cholesterol side chain cleavage enzyme, 3β-hydroxysteroid dehydrogenase 1 and 17α-hydroxylase but had almost undetectable 17β-hydroxysteroid dehydrogenase 3 and 11β-hydroxysteroid dehydrogenase 1 activities, while RILCs has increased 17β-hydroxysteroid dehydrogenase 3 and 11β-hydroxysteroid dehydrogenase 1 activities. Because RPLCs and RILCs had higher 5α-reductase 1 and 3α-hydroxy-5α-reductase 1 activities, they produced mainly 5α-reduced androgens.

Conclusion: In conclusion, the purified RPLCs, RILCs and RALCs are comparable to the counterparts during the rat pubertal development.

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Introduction and Objectives: The objective of the present study was to determine the extent to which rat stem Leydig cells differ from progenitor, immature and adult Leydig cells by extensive miRNA analysis.

Methods: We purified rat cell types in the Leydig cell lineage from Sprague Dawley rats. We performed miRNA profiling of stem Leydig cells and its profiling was compared to the cell types (progenitor, immature and adult Leydig cells) in the Leydig cell lineage.

Results: Using miRNA array containing 653 common miRNAs, we identified 3 miRNAs (including miR-31, miR-221&222) that were down-regulated by i',10 fold and 40 miRNAs (including miR-142-3p, miR-142-5p, let-7) up-regulated by i',10 fold during the transition of stem into progenitor Leydig cells. miR-124 and miR-325 were also significantly down-regulated, mi-532-5p up-regulated during progenitor to immature Leydig cell transition. Using PicTar and TargetScan, we found that NR5A1-3'UTR has miR-31 binding site. MiR-221&222 have been found to be critical for the regulation of CDKN1B.

Conclusion: In conclusion, we identify miRNAs from stem, progenitor, immature and adult Leydig cells that may regulate their differentiation during their transition.

THE MOST USEFUL INDICATOR FOR A DIAGNOSIS AS TESTOSTERONE DEFICIENCY SYNDROME IS BIOAVAILABLE TESTOSTERONE USING LC MS/MS IN JAPANESE POPULATION

Eitetsu Koh, PhD, MD, Masaki Taya, MD, Masashi Iijima, MD and Mikio Namiki, PhD, MD
Department of Integrative Cancer Therapy and Urology, Kanazawa University Graduate School of Medical Science, Kanazawa, Japan

Introduction and Objectives: The European and American guideline for diagnosis of testosterone deficiency syndrome (TDS) recommends a measurement of serum total testosterone (TT). However, Japanese associations recommended the measurement of analog free testosterone (aFT) instead of TT. We reported TT value never declined with aging in Japanese healthy population and bioavailable testosterone (BT) is most useful marker for diagnosis of TDS. The aim of the study was to evaluate the TT value in Japanese population using liquid chromatography tandem mass spectrometry (LC MS/MS) and to assess an application of measurement of aFT value instead of TT.

Methods: To assay serum BT, sex hormone-binding globulin was precipitated with concanavalin-A and then testosterone was measured using liquid chromatography-tandem mass spectrometry. This study included 98 subjects present in 3/29. The remaining 21 patients did not show alterations in the hormonal parameters studied (Others). The results are presented in the table I (mean ± SD).

Results: Mean TT, aFT, cFT, LC–BT, cBT and SHBG were 4.78±1.65 ng/mL (range 1.21 – 9.45), 8.99±3.93 pg/mL (range 2.1 – 22.9), 89.2±32.1 pg/mL (range 186 – 15.8), 0.733±0.26 ng/mL (range 0.25 – 1.68), 2.08±0.77 ng/mL (range 0.362 – 4.16) and 39.5±16.3 nmol/L (range 13.8 – 81.5), respectively. According to Pearson test, correlation between age and each values showed TT (R²=0.038, P=0.052), aFT (R²=0.172, P=0.0001), cFT (R²=0.077, P=0.0056), LC-BT (R²=0.1377, P=0.0002), cBT (R²=0.0973, P=0.0018) and SHBG (R²=0.051, P=0.0249), respectively. An increasing age was no correlation with TT, significantly. On the other hand, aFT, cFT, cBT and SHBG had a correlation with aging.

Conclusion: Although TT value in Japanese population is almost constant with aging in this study, aFT and BT value decreases and SHBG value increases. This finding raises the possibility that a relatively high increased formation of SHBG-binding testosterone with aging may show constant in TT value. Therefore, aFT or non-sex hormone-binding globulin testosterone (=BT) are a suitable indicator for diagnosis of TDS in Japanese population.
**ABSTRACTS**

**Conclusion:** The lowest CoQ10 levels were observed in GHD patients, but also in the other groups we found a high ratio oxidized to total CoQ10. These preliminary data suggest a possible involvement of oxidative stress in unexplained fractures even if further investigations are needed to establish a possible correlation with anabolic hormones involved in bone metabolism.

<table>
<thead>
<tr>
<th></th>
<th>CoQ10 (μmol/mL)</th>
<th>COQ10/mole stearyl</th>
<th>CooQ10 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHD</td>
<td>0.54 ± 0.05</td>
<td>1.77 ± 0.25</td>
<td>11.2 ± 0.9</td>
</tr>
<tr>
<td>Hypogonadism</td>
<td>0.70 ± 0.25</td>
<td>1.06 ± 0.85</td>
<td>16.5 ± 2.6</td>
</tr>
<tr>
<td>Others</td>
<td>0.82 ± 0.30</td>
<td>1.67 ± 0.13</td>
<td>16.7 ± 1.7</td>
</tr>
<tr>
<td>Controls</td>
<td>0.75 ± 0.24</td>
<td>1.36 ± 0.87</td>
<td>40.4 ± 0.5</td>
</tr>
</tbody>
</table>

**65**

**THE INSL3 GENE IS A DIRECT TARGET FOR THE NUCLEAR RECEPTOR COUP-TFII IN MA-10 LEYDIG CELLS**

Raifish Mendoza, MSc, Etienne Camiré, Catherine Brousseau, MSc and Jacques J. Tremblay, PhD
Université Laval-Centre de recherche du CHUQ

(Presented By: Raifish Mendoza, MSc)

**Introduction and Objectives:** The nuclear receptor COUP-TFII (NR2F2) plays critical roles in cell differentiation and lineage determination in a wide variety of tissues. COUP-TFII is expressed in mesenchymal cells of the fetal testis and in Leydig cells and some peritubular myoid cells during post-natal life. Consistent with this, COUP-TFII-deficient mice exhibit Leydig cell dysfunction and impaired fertility. In these mice, expression of several genes essential for steroidogenesis as well as Ins3 is decreased. It remains to be demonstrated whether this is a consequence of improper Leydig cell differentiation in the absence of COUP-TFII or a direct regulation by COUP-TFII. INSL3, a hormone produced by fetal and adult Leydig cells, regulates testicular descent during fetal life and germ cell survival and bone metabolism in adults. However, little is known about the molecular mechanisms controlling Ins3 expression. We hypothesized that Ins3 is a direct target of COUP-TFII in Leydig cells. Our objectives were to determine if COUP-TFII directly activates the mouse Ins3 promoter in MA-10 Leydig cells and to determine its mechanism of action.

**Methods:** Knockdown of COUP-TFII in MA-10 Leydig cells using siRNA resulted in a 40% decrease in Ins3 mRNA levels, in agreement with the KO data. This also validated the MA-10 Leydig cell line as a suitable model for our study. Next, we performed transient transfections of MA-10 Leydig cells and found that a -1087 bp mouse Ins3 promoter was activated 4-fold by COUP-TFII. Using 5' progressive deletion constructs (-800, -600, -400, -333, -285, -235, -186, -79 bp), the COUP-TFII responsive element was located between -186 and -79 bp. This region contains a previously uncharacterized direct repeat 1-like (DR1L) element, which is a potential binding site for COUP-TFII. Recruitment of COUP-TFII to this proximal promoter region was confirmed by ChIP while direct binding of COUP-TFII was shown by DNA precipitation assay.

**Results:** Mutation of both DR1L half-sites, which prevented COUP-TFII binding, significantly decreased COUP-TFII-mediated transactivation of an -1087 bp Ins3 reporter in CV-1 fibroblasts but not in MA-10 Leydig cells.

**Conclusion:** In conclusion, our data identify Ins3 as a direct target for COUP-TFII in Leydig cells and also suggest that COUP-TFII can act independently of DNA binding most likely through protein-protein interactions with other DNA-bound Leydig cell transcription factors.

**Funding:** Supported by CIHR.

**ENVIRONMENT / TOXICOLOGY**

**66**

**SPERM MRNAS ARE MOLECULAR MARKERS OF MINIMAL TESTICULAR INJURY IN RATS**

Linnea Anderson, MSc¹, Edward Dere, PhD², Susan Hall, BS¹ and Kim Boekelheide, MD, PhD³
¹Brown University; ²Brown University, Rhode Island Hospital
(Presented By: Linnea Anderson, MSc)

**Introduction and Objectives:** Traditional endpoints used to measure male reproductive function in humans, including semen and hormone analysis, are insensitive and unreliable. The endpoints used to monitor toxicity in animal studies, while sensitive, are not easily translatable to humans. It is therefore necessary to develop sensitive and reliable molecular biomarkers of testicular injury that can be used to both monitor human reproductive function and compare animal studies with human exposures. This study aimed to identify mRNA transcripts that are altered in the sperm following exposure to the Sertoli cell toxicants 2,5-hexanedione (2, 5-HD) or carbendazim (CBZ), and to compare the molecular markers to standard reproductive assessments to determine if these indicators are sensitive and specific biomarkers of testicular injury.

**Methods:** Adult male rats were exposed to a range of doses of either 2, 5-HD (0, 0.14, 0.21, or 0.33% in the drinking water) or CBZ (0, 30, 50, or 70 mg/kg by daily oral gavage) for three months. Standard measures of toxicity including reproductive organ weights and histopathology were assessed. Sperm mRNAs were isolated from cauda epididymal sperm and measured by custom qRT-PCR arrays. The array results were compared to the standard histopathological assessment of testicular retained spermatid head (RSH) quantification to determine if the mRNAs correlated with injury.

**Results:** 2, 5-HD and CBZ treatment produced low levels of reproductive toxicity, and the two lowest doses of CBZ caused no apparent testicular injury by standard assessment. A total of eight sperm mRNA transcripts were altered across all toxicant and dose groups. The transcript for clusterin, an apoptosis-related glycoprotein, was increased at all doses of both 2, 5-HD and CBZ, even in the absence of apparent toxicity. This response was significant and dose-dependent, and indicates that clusterin may be highly predictive of testicular injury.

**Conclusion:** Sperm mRNA transcripts, and clusterin in particular, are sensitive markers of testicular toxicity in rats. Future work will focus on further developing male reproductive biomarkers and determining their utility in humans.
ALUMINIUM CHLORIDE INDUCED ALTERATIONS IN THE TESTIS AND SPERMATOZOA OF RATS AND ITS POSSIBLE AMELIORATION BY VITAMIN–E

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Introduction and Objectives: It is evident that heavy metals released in the environment affect the reproductive processes and fertility of animals. Considering the usage and toxicity of aluminium, the present study was conducted to evaluate the effects of aluminium chloride on sperm quality, biochemistry and histology of the testes and also the ameliorative effect of vitamin E upon the damage, if any.

Methods: Adult male albino rats were administered with aluminium chloride at a dose 50 mg/kg body weight, daily for 45 days. Second group of rats were treated with aluminium chloride along with vitamin E. Third group of rats treated with vitamin E alone and the fourth group served as withdrawal group. All the groups of rats were compared with the control group. At the end of the experimental period the animals were sacrificed and the testis was removed, processed immediately for biochemical and histological studies. Sperm was collected from the cauda epididymis.

Results: Sperm count, motility, morphology and density were significantly reduced. The pH, colour and turbidity were unaffected. In the testis of aluminium chloride treated rats, histological observations revealed marked alterations ranging from small changes to pronounced effect. Leydig cells were considerably reduced. Interstitial cells showed degenerative changes with spermatogenic arrest and loosening of germinal epithelium. Destruction of spermatogenic seminiferous tubules were also observed. The activities of adenosine triphosphatases, alkaline phosphatase, 5’nucleotidase and gamma glutamyl transferase were estimated in the testis by standard spectrophotometric methods. The activities of all the enzymes studied were significantly decreased in testis. Antioxidant enzymes like catalase, superoxide dismutase, glutathione peroxidase, glutathione reductase and glutathione-s-transferase were also severely altered. Vitamin E treatment almost counteracted the effect of aluminium chloride. In the withdrawal group most of the parameters studied were brought back to normalcy.

Conclusion: The present study suggests the reproductive toxicity of aluminium by inducing the histological and biochemical alterations in the testis and spermatozoa and possible recovery by vitamin E treatment.

ACUTE SENSITIVITY OF THE PREPUBERTAL MOUSE TESTIS TO DI-N-BUTYL PHTHALATE IDENTIFIES A HIERARCHY OF EFFECTS IN THE DEVELOPING TESTIS

Catherine Itman, PhD, Sarah Moody, Bachelor of Biomedical Science and Kate Loveland, PhD
Monash University

Introduction and Objectives: Phthalate esters, endocrine disrupting chemicals which display anti-androgenic activity, are linked to male reproductive disorders. Such conditions are considered to be of foetal origin, hence most studies focus on phthalate effects before birth. The objective of this study was to specifically examine whether phthalates impact on neonatal and prepubertal testis development, using the mouse as a model.

Methods: C57Bl/6J mice were fed 1 – 500 mg/kg/day di-n-butyl phthalate (DBP) in corn oil vehicle, or vehicle only, from 4 days post partum. Mice were culled at 7 or 14 days (n>7/group), serum hormones were analyzed by radioimmunoassay, body and testis weights were measured and tissues fixed for histology and immunohistochemistry.

Results: Testis size was significantly lower after 3 days of DBP exposure, with dose-dependent decreases evident by 10 days. DBP delayed Sertoli cell development, as assessed by Sertoli cell nuclear localization, lumen formation and immunohistochemical detection of anti-Mullerian Hormone and Connexin-43. Spermatogenesis was delayed at 14 days, with pachytene spermatocytes present in only 5% of cord cross-sections in animals treated with 10 – 500 mg/kg/day DBP, compared to 16% in corn oil-treated animals. DBP-treated animals had elevated serum inhibin and increased immunohistochemical staining for the inhibin alpha subunit was observed in testis sections. Serum FSH levels were unaltered, suggestive of localized suppression of activin bioactivity within the testis. No Leydig cell aggregation was observed, however increased cell density within the interstitium and reduced circulating testosterone indicates DBP may also affect prepubertal Leydig cells.

Conclusion: This study demonstrates the neonatal/prepubertal testis is acutely sensitive to DBP at doses corresponding to human exposure levels, with outcomes indicating events associated with testicular dysgenesis also occur during prepubertal development. Our ongoing studies are identifying long-term effects on adult testis function and fertility.
FINASTERIDE 1 MG/DAILY DECREASES SPERMATOGENESIS, IMPAIRS SPERM MATURITY, DECREASES TESTOSTERONE AND INCREASES LH LEVELS IN YOUNG MEN IN REPRODUCTIVE AGE: INITIAL REPORT.

Jorge Hallak MD, PhD, Medical Assistant1,2, Juliana Pariz MSci3,4, Andressa Ferrette Graduate Student5 and Patricia Pieri PhD6,9
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Methods: We studied 19 male subjects who came for an initial andrological evaluation and compared results with a group of age-matched 174 pre-vasectomy candidates with no risk factors for sperm/testicular dysfunction. Each patient filled a complete medical report that includes habits and lifestyle patterns: use of drugs/medication. Patients who self-reported use of finasteride 1mg for more than one year were included.

Results: Finasteride users had significantly decreased: Total Sperm Count (p=0.005), Total Motile Sperm Count (p=0.011) and Total Motility (p=0.022) and increased immotile sperm (p=0.02). Total testosterone levels were decreased (p=0.03) and LH levels were increased (p=0.001). Creatine-kinase activity which is a marker of sperm immaturity was increased in finasteride users (p=0.009).

Conclusion: Our results demonstrate that finasteride use in young patients may be contraindicated if they are willing to father their own offspring. We do not yet know the long-term effects on male reproductive health and recovery rate after discontinuation, but this study highlights new information on counseling patients by andrologists and points to a better evaluation of male reproductive and sexual health before prescribing finasteride by dermatologists and other health professionals.

MARIJUANA CONSUMPTION AFFECTS THE MALE REPRODUCTIVE HEALTH

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Methods: The study included 34 marijuana users (study group) aged 21 to 58 years –old, and 814 pre-vasectomy patients (control group) from both the private laboratory Androscience and the Section of Andrology – HCFMUSP. Seminal analysis was performed according to the WHO’s guidelines and morphology also according to the KrugerÂ’s criteria. Data analysis was performed using the Wilcoxon test and a linear model of gamma distribution to extract the age effects on each parameter; p value of <0.05 was adopted.

Results: Significant effect of Marijuana was observed in LH levels, semen pH, total sperm count, total progressive motility and both WHO and Kruger morphology (p<0.001).

Conclusion: The consumption of C. sativa has a negative effects on male reproductive health, reflected in a significant elevation of LH levels and a significant reduction in sperm count, progressive motility and morphology. Although the negative impact of THC consumption on sperm presented here confirms previously reported data, there is no report on increased LH levels in Marijuana smokers, suggesting an impact of the drug on the hypothalamus/hypophysis/gonad axis.
EPIDIDYMAL EPITHELIAL STRUCTURES IN WILD RODENTS FROM BRAZILIAN ATLANTIC FOREST
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(Presented By: Mariana Neves, PhD)

Introduction and Objectives: Brazilian tropical forest ecosystems are undergoing an accelerated process of fragmentation due to environmental pollutants, and small wild rodents are considered good indicators of their presence in their natural habitat. The knowledge of their behavior involves the understanding of their reproductive features. The epididymis is strongly regulated by hormones and represents a valuable marker to monitor the levels of hormone disrupting chemicals. Therefore, the aim of this study was to characterize epididymal epithelial structures of Oligoryzomys sp and Akodon cursor using immunofluorescence labeling.

Methods: Small adult rodents were captured at a Private Reserve of Atlantic Forest in Viçosa, MG, Brazil. This study was authorized by Brazilian Institute of Environment and Hydric Sources (IBAMA 22289-1) and approved by the Committee on Research Animal (CEUA 09/2012). Animals were euthanized and their epididymis were fixed using paraformaldehyde-lysine-periodate fixative and cryoprotected in a solution of 30% sucrose in PBS. They were embedded in Tissue-Tek OCT compound, and mounted for cryosectioning. Some 5-µm sections were double-stained with anti-aquaporin 9 (AQP9) and anti-vacuolar proton pumping ATPase (V-ATPase) B1 subunit antibodies; others were stained with anti-keratin 5 (K5) antibodies. Slides were mounted in Vectashield with DAPI, and were examined using a Nikon E800 microscope. Digital images were acquired with IPLab Spectrum software. Z-series (0.1-µm interval) were imported into Velocity software for 3D reconstruction.

Results: Similarly to laboratory rats and mice, AQP9 was abundantly expressed on the apical membrane of principal cells along the entire epididymis in both species. Clear cells, identified by their positive labeling for V-ATPase, significantly increased in number from the proximal to the distal regions of the epididymis. V-ATPase staining was found in sub-apical vesicles and apical microvilli in these cells. Clear cells in both species were narrower than clear cells in the epididymis of mice and rats. Basal cells, labelled for K5, showed abundant lateral projections and a few projections going toward the lumen. Monitoring expression of markers specific for each epididymal cell type in wild rodents captured in different ecosystems should provide valuable information on the level of pollutants in these areas.

Conclusion: These studies thus provide a framework for the study of environmental pollutants and their potential effect on male fertility.

TRANSURETHRAL SEMINAL VESICULOSCOPY USING A 6F VESICULOSCOPE FOR EJACULATORY DUCT OBSTRUCTION: INITIAL EXPERIENCE
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(Presented By: Zhiyong Liu)

Introduction and Objectives: Ejaculatory duct obstruction (EDO) is a surgically correctable condition that occurs in some infertile men. The standard therapy is transurethral resection of ejaculatory ducts (TURED). However, TURED has been associated with a high risk of complications, including the impairment of semen parameters and retrograde ejaculation. In our clinical practice, vesiculoscropy has demonstrated potential as a minimally invasive alternative technique for the diagnosis and treatment of EDO. Very few studies have examined transurethral seminal vesiculoscopy (TRU-SVS) in recent years, and no study has examined 6F vesiculoscopes. Therefore, we performed a retrospective study of TRU-SVS using a 6F vesiculoscope and its impact on the diagnosis and treatment of EDO.

Methods: A total of 56 patients who underwent this procedure were included in the study. The mean patient age was 25.6 years (range, 21 – 37 years). The procedure was completed successfully in all patients within a mean time of 27.5 min and a mean hospital stay of 1.5 days.

Results: All patients had EDO. Calculi were found in the ejaculatory ducts or in the seminal vesicles of 5 patients. Sperm was detected in 11 patients 1 – 3 months postsurgery and in another 8 patients 3 – 12 months post-surgery. No sperm was detected in the remaining 2 patients by 12 months postsurgery. Epididymitis, retrograde ejaculation, urinary incontinence and rectal injury were not observed.

Conclusion: These data indicate that TRU-SVS using a 6F vesiculoscope affords direct access to the seminal vesicle and offers the advantages of fewer complications and more optimal sperm recovery as well as direct, dynamic video imaging.
ABSTRACTS

FERTILIZATION / GERM CELL DIFFERENTIATION / REPRODUCTIVE DEVELOPMENT

73

INITIAL CHARACTERIZATION OF G PROTEIN-COUPLED RECEPTOR 56 (GPR56) IN MAMMALIAN SPERMATOGENIC CELLS AND SPERM

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(Presented By: Kethelyne Beauvais)

Introduction and Objectives: The proteins involved in the initial stages of mammalian fertilization have not been fully characterized. Many of these proteins are likely to be in the acrosomal region, which is the first part of the sperm that interacts with the cumulus layer and zona pellicuda of the egg. Among the many proteins identified in a proteomic study of the guinea pig sperm acrosome was GPR56, a member of the adhesion family of G protein-coupled receptors, that is involved in cell-cell interactions, tumor biology, and testis development.

Methods: To further understand the role of GPR56 in reproduction, Western analysis and immunofluorescence microscopy were used to characterize the expression and location of the protein in spermatogenic cells of guinea pigs (Cavia porcellus). GPR56 protein was detected in testis and spermatogenic cell extracts as a tight polypeptide band at ~40 kDa. This is smaller than expected (~60 kDa) but is the same size as deglycosylated GPR56. Also, localization of GPR56 in spermatogenic cells appeared to condense in the acrosomal region as germ cells mature. Some of the protein appeared to be on the surface, but much of the protein was found inside the acrosome and not on the cell surface.

Results: The acrosomal localization of GPR56 was confirmed by co-localization with the acrosomal protein zpr3/sp56 by immunofluorescence microscopy in mature mouse sperm. Our findings that GPR56 in spermatogenic cells appears to be unglycosylated and is located in the acrosome (a Golgi-derived vesicle) are consistent with other studies in somatic cells where unglycosylated GPR56 remained in the secretory pathway, particularly the Golgi (Jin et al., Human Molecular Genetics, 2007, 16:1972−1985).

Conclusion: Finally, in a functional assay to test the effects of anti-GPR56 antibodies on guinea pig sperm during a 90-minute incubation, acrosomal exocytosis was induced to a greater extent than controls suggesting that GPR56 may be a receptor for a ligand or ligands that trigger acrosomal exocytosis.

Funding: The Jefferies Memorial Trust; a Chenery Grant, and the Schapirio Undergraduate Research Fellowship (SURF) program at Randolph-Macon College.

GENETICS

74

EFFICIENT TRANSFECTION OF DNA INTO PRIMARILY CULTURED RAT SERTOLI CELLS BY ELECTROPORATION

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(Presented By: Fuping Li)

Introduction and Objectives: Expression of exogenous DNA in Sertoli cells is essential for studying of its functional genomics, pathway analysis and medical applications. Electroporation is a valuable tool for nucleic acid delivery even in primarily cultured cells which are considered difficult to transfect. In this study, we described an optimized protocol for electroporation-based transfection of Sertoli cells and compared its efficiency with conventional lipofection.

Methods: Sertoli cells were transfected with pCMV-GFP plasmid by square-wave electroporation in different conditions. After transfection plasmid into Sertoli cells, EGFP expression could be easily detected by fluorescent microscope and cells survival was evaluated by dye exclusion assay using trypan blue.

Results: According for both cell survival and the percentage expressing EGFP, 250 V was determined to produce the greatest number of transiently transfected cells. Keeping voltage consistent (250 V), the pulse length of 20um was observed relatively higher cell survival (76.4%) and transfection efficiency (31.1%). The number of pulses significantly affected cells survival and EGFP expression. Cells survival clearly decreased following 1 to 3 pulses from 82.5% to 3.3% with GFP expression increasing from 31.6% to 66.7%. The yield of positive cells increased with increasing concentrations of plasmid DNA (range 10 – 50 μg/ml) from 14.3% to 34.1%, but cells viability steadily decreased following 20 μg/ml plasmid DNA from 77.2% to 56.6%. Compared to two popular cationic lipids transfection methods, the transfection efficiency of electroporation (21%) was significantly higher than Lipofectamine 2000TM (2.9%) and EffecteneTM (1.9%) in this experiment.

Conclusion: We described the process of optimizing electroporation conditions, and the successful electroporation of plasmid DNA into primarily cultured Sertoli cells. Our results indicated that the method of electroporation is more suitable for transfection of Sertoli cells.
ABSTRACTS

THE ROLE OF PARCIAL AZFC MICRODELETIONS ON THE SEX-RATIO OF CHILDREN BORN TO FERTILE MEN OF JAPANESE ORIGIN IN BRASIL: REGULATION OF SECONDARY SEX-RATIO MAY ALSO BE INFLUENCED BY GENETIC FACTORS

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Introduction: Deletions of the human azoospermic factors (AZFa, AZFb, AZFc) located on the Yq chromosome are one of the main causes of male infertility. Complete AZFc deletion is the most frequent worldwide but the effect of partial AZFc deletions are yet to be fully understood.

Methods: We first performed a first round screening for classical AZFc microdeletion in 223 Japanese-of-origin men using STSs sY254, followed by PCR using specific STSs (G73166-MboI; G73168-AluI; G73167-FspI) and restriction analysis (2U overnight at 37°C) directed to the SNVs that characterize each specific DAZ copy (Fernandes et al. 2002).

Results: No partial deletion (del-) was identified in 28 (12.6%) men; deletion of DAZ4 (del4) was found in 120 (53.8%) men and of DAZ1/DAZ2/DAZ3 (del123) in 75 (33.6%). The three groups showed similar mean number of children (del- 2.07; del4 2.13; del123 1.93) and sex-ratio (del- 1.23; del4 1.21; del123 0.93). The highest sex-ratio was found in the spring time (del- 1.88; del4 1.68; del123 1.44) and the lowest in the summer with a significant difference (p<0.05) for the del123 group (del- 0.91; del4 0.96; del123 0.56).

Conclusion: Partial AZFc deletions are frequent in Japan and seasonal differences in sperm count was recently reported (Nakahori et al, 2012). To the best of our knowledge, this is the first report on the influence of Y chromosome microdeletion in the modeling of human populations. We propose a hypothesis according to which AZFc partial deletion, together with environmental factors, may be an important event in regulating the overall fertility of populations by means of lowering the secondary sex-ratio.

GENOMIC DISORDERS ASSOCIATED WITH GENITAL ANOMALIES AND MIDLINE FUSION DEFECTS

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Introduction and Objectives: Congenital defects of the genitourinary (GU) system are a relatively common. Genitourinary diseases such as hypospadias and cryptorchidism occur with a frequency similar to, or greater than other common birth defects such as heart, cleft lip/palate, and Down syndrome. The majority of incidences of hypospadias and cryptorchidism is classified as non-syndromic and idiopathic and cannot be explained by mutations, SNPs, or aberrant androgen synthesis or actions. It is well documented that submicroscopic copy number variations (CNVs) are present throughout the genome in humans and are causative for disease phenotypes. We hypothesized that these submicroscopic chromosome aberrations are present in subjects with hypospadias and cryptorchidism and affect dosage sensitive genes that are critical for GU tract development.

Methods: To test our hypothesis we performed array Comparative Genomic Hybridization (aCGH) using sex-matched genomic DNA (gDNA) from men of proven fertility and normal development (controls) compared to gDNA from subjects diagnosed with hypospadias and cryptorchidism. Quantitative PCR was used to validate de novo or inherited duplications or deletions that were distinct from CNVs found throughout the genome (Database of Genomic Variants – http://projects.tcag.ca/variation/). We identified CNVs in unrelated subjects and with the GU defects under investigation. In patients with cryptorchid testes and midline fusion defects, we observed duplications at 1q25, 5q11, 10q23, 13q32, and 16p11. Genes in these regions regulate processes such as cell proliferation, mitochondrial function, apoptosis, and migration. An ~27 Kb deletion affecting 10q25 was observed in a patient with cryptorchid testes and another with both cryptorchid testes and hypospadias. This deletion involves intron 5 of a gene that mediates vesicle transport pathways through interactions with t-SNAREs.

Results: We identified an approximately 300 Kb, GU defect susceptibility region involving 12 genes, in eight patients with 16p11.2 duplication syndrome. Preliminary immunohistochemistry experiments reveal expression of candidate proteins in the genital tubele and testes of E16.5 mouse embryos. The function of these genes in male external genitalia development is unknown.

Conclusion: Novel, candidate genes identified by aCGH may be required for normal GU tract and male external genitalia development and function. Identification of such genes will improve patient diagnosis and perhaps treatment.
Oxidative Stress and Sperm DNA Damage: Affect on Early Events of Conception, Indices of Embryo Growth and Embryo Quality in Couples Opting for IVF

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Introduction: Sperm genome plays a key role in maintaining reproductive potential: the impact of altered paternal genome is as important as that of maternal genome. However, while the role of oocyte is being increasingly recognized, the influence of male germ cells on conception is still not clear. The study investigates the association of reactive oxygen species (ROS) and sperm DNA damage on fertilization rate, cleavage rate, embryo quality and on pregnancy outcome in couples opting for in vitro fertilization (IVF).

Material and Methods: In 112 infertile males opting for IVF and 74 fertile controls, ROS levels in semen were analyzed by chemiluminescence and sperm DNA damage was quantified by comet assay. Standard IVF protocol was adopted. Fertilization and cleavage rate, embryo quality and pregnancy outcome were followed up and documented.

Results: ROS levels (35.57 RLU/sec/million) in non conceived group was significantly higher (p=0.0344) as compared to conceived group (23.47 RLU/sec/million). However, fertile controls had significantly lower (p=0.0001) ROS levels (15.41 RLU/sec/million) as compared to conceived group (23.47 RLU/sec/million). Increase in ROS was associated with decreased fertilization rate, cleavage rate and embryo quality in the conceived and the non conceived group. Sperm DNA fragmentation index (DFI) in conceived group (25.42) was significantly lower (p=0.0001) than non conceived group (35.22). Though DFI in conceived group (25.42) was significantly higher (p=0.0003) as compared to controls (19.58). Fertilization rate, cleavage rate and embryo quality had a negative correlation with DFI in non conceived group and conceived group. ROS levels and Sperm DFI had no correlation with pregnancy outcome in both conceived and non conceived group. No correlation of sperm parameters was observed with any of the investigated parameters.

Conclusion: Though ROS and sperm DFI adversely affect fertilization rate, cleavage rate and embryo quality, but in our study, ROS and DFI had no association with the pregnancy outcome probably due to selection of best quality of embryo for implantation during the IVF procedures. Thus ROS and sperm DFI have better diagnostic and prognostic capability to discrete fertile and infertile men. Considering the risk of childhood cancers, leukemias, and/or autism in children conceived by assisted conception, ROS and sperm DNA damage assessment should be included in workup of infertile males opting for assisted conception.
Introduction and Objectives: Studies have shown the high rate of returning fertility following microsurgical vasectomy reversal (VR); however, little is known about the management of patients with suboptimal postoperative semen parameters. This retrospective analysis reviewed records from 526 subjects that underwent a microscopic VR at a single institution with two primary surgeons and then received anti-inflammatory medication for the management of semen parameters.

Methods: Patients with <15 million motile sperm in the ejaculate received a regimen of 20mg Prednisone daily for 7 days followed by 6 weeks of a non-steroidal anti-inflammatory (NSAID), 600mg Ibuprofen three times daily or 200mg Celebrex once daily. Patients were advised to recheck a semen analysis 6 weeks into treatment. Analyzed data included obstructive interval, patient age, partner age, surgery connection, patency, time to first semen analysis, pre- and post-treatment total motile sperm count.

Results: The mean obstructive interval was 10 ± 6.0 years (range 0–33), patient age 41 ± 6.7 years (range 26–65) and partner age 32.3 ± 5.0 years (range 21–46). Bilateral vasovasostomy (VV) was performed on 60% of patients (318/526), bilateral vasoepididymostomy (VE) on 18% (94/526) and unilateral vasovasostomy with unilateral vasoepididymostomy (VV/VE) on 22% (114/526). Overall patency was 91% (477/526) and among bilateral VE patients was 85% (269/318), among VV/VE patients was 75% (86/114) and among bilateral VE patients was 59% (55/94). Further analysis of non-responders revealed 61% (69/114) failed to comply with protocol and 39% (45/114) complied. Improvement in total count was seen in 9% (10/114) but no improvement was seen in motility or total motile. This therapy appears to benefit patients with suboptimal semen parameters. Bilateral VV patients showed the highest response to this therapy followed by VV/VE patients and bilateral VE patients with the lowest response. With the limitations of a retrospective analysis, this study suggests clinical guidelines for managing inflammation following VR with need for further research.
Introduction and Objectives: Sperm associated α-L-fucosidases have been reported in a variety of organisms, and the wide-spread distribution of this enzyme is consistent with the importance of carbohydrates during fertilization. Human semen contains two novel isoforms of α-L-fucosidase; sperm membrane-associated α-L-fucosidase (SMALF) and seminal plasma α-L-fucosidase (SPALF). The role of SPALF remains unclear; however, SMALF has been documented to function during mammalian fertilization using a Syrian hamster in vitro model system. Previous studies using bulls have indicated a relationship between α-L-fucosidase and fertility, with high fertility bulls having significantly more α-L-fucosidase in their semen compared to low fertility bulls. The goal of this project was to investigate whether this relationship exists in humans by quantifying α-L-fucosidase in human semen from fertile and infertile men.

Methods: In accordance with an approved IRB, discarded semen samples from fertile and infertile men were collected, placed into cryopreservation medium, and stored in liquid nitrogen until analysis. Fluorometric enzyme assays utilizing the substrate 4-methyl-umbelliferyl-α-L-fucopyranoside (4-MU-Fuc) were performed to quantify SPALF and SMALF activity. Semen samples were thawed from liquid nitrogen in a 37°C incubator and subjected to centrifugation at 5000 x g topartition the seminal plasma from sperm cells. Additionally, a portion of the thawed, whole semen was washed in HSM, and the resulting sperm pellet was resuspended for analysis. Some sperm cell preparations were permeabilized with TritonX-100 to expose previously documented cryptic stores of α-L-fucosidase. All enzyme assays were conducted at 37°C over 30 minutes without the addition of stop reagents.

Results: Enzyme activity was completely inhibited by inclusion of 5 mM deoxyfuconojirimycin (DFJ), a specific, competitive inhibitor of α-L-fucosidase. Eight microliters of each preparation was fixed onto a microscope slide for future immunolocalization experiments. Preliminary results from fluorometric enzyme assays revealed differences in SPALF and SMALF activity in semen samples from infertile men. Conclusion: Results from these and future experiments could lead to the development of a diagnostic tool/assay that could be used as a predictor of male fertility.

ABSTRACTS

81
FUNCTIONAL DISTRIBUTION OF HUMAN SEMEN ALPHA-L-FUCOSIDASE AS A PREDICTOR OF FERTILITY
Neil T. Sullivan, BS and Jennifer J. Venditti, PhD, MS, BS
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(Presented By: Neil T. Sullivan, BS)

82
EFFECTS OF HORMONAL STIMULATION OF TESTICULAR FUNCTION ON SPERM PARAMETERS
Anastasios Syllakos, MD, Panagiota Georgopoulos, MD, Stavros Gratsias, MD, Evlalia Vlachopoulou, BS, Panagiota Tsoumpi, BS, Fotios Dimitriadis, MD, PhD, Dimitrios Giannakis, MD, PhD, Georgios Seminis, MD, Athanasios Lazaridis, MD, Achilles Papageorgiou, MD and Nikolaos Sofikitis, MD, PhD
Ioannina University Department of Urology
(Presented By: Anastasios Syllakos, MD)

83
INVESTIGATION OF MALE INFERTILITY USING QUANTITATIVE COMPARATIVE PROTEOMICS
Christine Légaré, MSc, Frédéric Fournier, PhD, Arnaud Droit, PhD, Franchine Cloutier, BSc, Roland R. Tremblay, MD and Robert Sullivan, PhD
Laval University
(Presented By: Christine Légaré, MSc)
**ABSTRACTS**

**MALE SEXUAL FUNCTION**

**85**

**ADIPOSE TISSUE-DERIVED STEM CELL THERAPY FOR PREVENTION AND TREATMENT OF ERECTILE DYSFUNCTION IN A RAT MODEL OF PEYRONIE’S DISEASE**

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(Presented By: Ahmet Gokce, MD)

**Introduction and Objectives:** Peyronie’s Disease (PD) is a condition of the penis, characterized by the presence of localized fibrotic plaques in the tunica albuginea (TA) and is associated with erectile dysfunction (ED). While surgical correction remains the gold standard, the search for an effective and less invasive therapy continues. The objective of this study was to evaluate the effects of a local injection of adipose tissue-derived stem cells (ADSCs) in a rat model of PD on the subsequent development of ED.

**Methods:** A total of 24 male Sprague-Dawley rats (300 – 350 g) were randomly divided into four groups: 1) sham (saline-injected into the TA); 2) PD (transforming growth factor (TGF)-β1 (50 μg) injected into the TA); 3) PD plus ADSCs-prevention group (5x10^5 ADSCs injected into TA on the same day as TGF-β1 injection); and 4) PD plus ADSCs-treatment group (5x10^5 ADSCs injected into TA 30 days after TGF-β1 injection). Forty-five days following TGF-β1 injection, rats underwent erectile function assessment by measuring the total intracavernous-to-mean arterial pressure ratio (ICP/MAP) and total ICP during cavernous nerve stimulation.

**Results:** The sham and PD groups had an ICP/MAP ratio of 48±9 compared to 18±2% (p = 0.004) at 2.5 V, 64±7 compared to 45±6% at 5.0 V (p = 0.04), and 79±3 compared to 72±3% at 7.5 V (p = 0.05). In both prevention and treatment groups, intracavernous injection of ADSCs resulted in significant improvement of erectile function with ICP/MAP ratios of 72±5, 78±3, 85±2 and 44±8, 67±5, 81±4 at stimulation voltages of 2.5, 5.0, and 7.5 V, respectively (p < 0.05).

**Conclusions:** This study demonstrates the preventative and treatment benefits of ADSCs on erectile function in an animal model of PD. Further study and validation of results is required.

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ABSTRACTS

86

DHEA AND DHEA-S IN NORMAL MALE EJACULATORY FUNCTION
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(Presented By: Matthew Wosnitzer, MD)

Introduction: DHEA and DHEA-S levels decline with age, but the relationship of these adrenal androgens to ejaculation in men has not been well-studied. We sought to establish baseline parameters for these hormones and to define changes occurring during ejaculation in men of various ages with and without ejaculatory dysfunction.

Methods: 30 healthy male patients without erectile or ejaculatory dysfunction were evaluated in an IRB-approved protocol. Orgasmic quality questionnaire (linear scale 1 – 10), morning venipuncture (DHEA, DHEA-S levels) 12 hours prior to and 15 minutes following ejaculation following self-stimulation with transperineal ultrasound monitoring were conducted. Ultrasound bulbar urethral (BU) diameter change was used as a proxy for arousal, and bulbocavernosal muscle (BCM) length/thickness was a proxy for orgasmic quality. The number of BCM contractions was used as a surrogate for central spinal cord motor generator function. Analysis was completed using paired t-test, Wilcoxon rank sum test and linear regression.

Results: Mean cohort age was 37.7±16.7 years. Pre-ejaculation DHEA was higher in men<40 years versus men >40 years (p<.0002). Post-ejaculation DHEA-S (mean 0.23, p<0.013) decreased for men<40 unlike men<40, who had no change. In all men, pre-ejaculation DHEA-S correlated with BCM thickness at maximum distension (p<.033). In men<40, DHEA-S correlated positively with BU maximum diameter (p<.04). In men<40, the change in DHEA-S correlated positively with increased BCM contraction during stimulation/ejaculation (p<.03). Pre-ejaculation DHEA correlated positively with thickness of BCM during ejaculation in men<40 (p<.03). DHEA change correlated positively with BCM thickness and length at maximum distension in men>40 (p<.015, p<.043). Post-ejaculation DHEA change correlated positively with orgasm quality in the population age>40 (p<.001).

Conclusions: Pre-ejaculation DHEA-S was higher in men<40 years and correlated with thicker BCM and BU diameter in all men. In men>40 years, post-ejaculation DHEA-S decreased. Increased DHEA-S post-ejaculation correlated with increased BCM contraction during stimulation for men<40. Pre-ejaculation DHEA correlated with BCM thickness in men<40. Higher post-ejaculation DHEA correlated with improved orgasm quality and BCM thickness in men>40. Differences in DHEA and DHEA-S before and post-ejaculation may contribute to age-related changes of BCM and BU function during ejaculation.

87

THE ROLE OF SEROTONIN, DOPAMINE, EPINEPHRINE, AND NOREPINEPHRINE IN NORMAL MALE EJACULATION
Matthew Wosnitzer, MD, Ali Dabaja, MD, Alexander Bolyakov, MSc and Darius Paduch, MD, PhD
Department of Urology, Weill Cornell Medical College, New York, NY
(Presented By: Matthew Wosnitzer, MD)

Introduction: Despite supraspinal control of the spinal ejaculatory generator by serotonergic and dopaminergic neurons, serum neurotransmitter/catecholamine parameters associated with ejaculation in healthy men are not known. Given serotonin, dopamine, epinephrine, norepinephrine alterations with stress, psychiatric medications (ie SSRIs), and premature/delayed ejaculation, we aimed to define serum neurotransmitter/catecholamine levels in relation to normal male ejaculation.

Methods: 30 healthy male patients without erectile or ejaculatory dysfunction were evaluated in an IRB-approved protocol. Orgasmic quality questionnaire (linear scale 1 – 10), morning venipuncture (serotonin, dopamine, epinephrine, norepinephrine) 12 hours prior to and 15 minutes following ejaculation following self-stimulation with transperineal ultrasound monitoring were conducted. Ultrasound bulbar urethral (BU) diameter was a proxy for arousal and bulbocavernosal muscle (BCM) length/thickness was a proxy for orgasmic quality. Analysis included paired t-test, Wilcoxon rank sum, and linear regression.

Results: Pre-ejaculation serotonin was significantly increased in men<40 years compared to men>40 years. Pre-ejaculation epinephrine correlated positively with BCM thickness during ejaculation (p<.015). Pre-ejaculation serotonin correlated positively with BCM thickness at rest (p<.028), and during ejaculation (p<.0003). Pre-ejaculation dopamine and norepinephrine did not correlate with US parameters. Post-ejaculation, men<40 had significantly increased epinephrine (mean 34.8 pg/ml, p<0.04) and serotonin (mean 155.3 ng/ml, p<0.003). Epinephrine and serotonin change were negatively correlated with orgasm quality (p<.014). Norepinephrine change was negatively correlated with flaccid/rigid penile length (p<.049, p<.041). Dopamine and epinephrine change were positively correlated with BCM thickness during ejaculation (p<.037, p<.018).

Conclusion: In men<40, epinephrine and serotonin were significantly increased post-ejaculation and correlated with decreased orgasm quality. Baseline serotonin and epinephrine correlated most often with BCM area and thickness before and during ejaculation. Serotonin reward or epinephrine pathways may affect BCM strength, or increased serotonin may affect BCM stimulation similar to rabbit peripheral serotonergic pathway causing cavernosal smooth muscle contraction. This novel role for serotonin and epinephrine in ejaculation requires further study.
THE ROLE OF OXYTOCIN IN NORMAL MALE EJACULATORY FUNCTION
Matthew Wosnitzer, MD, Ali Dabaja, MD, Alexander Bolyakov, MSc and Darius Paduch, MD, PhD
Department of Urology, Weill Cornell Medical College, New York, NY
(Presented By: Matthew Wosnitzer, MD)

Introduction: Oxytocin surge occurs during male sexual activity, peaking at orgasm with decline to baseline levels within 20 minutes. Human epididymal oxytocin receptors and rat epididymal peristaltic contractions from oxytocin have been described. However, in a placebo-controlled study of healthy males, intranasal oxytocin had no effect on human sexual behavior, despite anecdotal evidence of orgasm in an anorgasmic male. Although preclinical data implies importance of peripheral oxytocin receptors in seminal emission, and central receptors in ejaculation and male sexuality, there is a paucity of clinical data available. We sought to improve classification of oxytocin levels in healthy human males in relation to age and ejaculatory function.

Methods: 30 healthy male patients without erectile or ejaculatory dysfunction were evaluated by morning venipuncture (oxytocin) 12 hours prior to and 15 minutes following transperineal ultrasound and recording of ejaculation following self-stimulation were conducted. Ultrasound bulbar urethra (BU) diameter change was a proxy for arousal and bulbocavernosus muscle (BCM) length/thickness change was a proxy for orgasmic quality. Number of contractions was considered a surrogate for function of the central spinal cord motor generator. Analysis included paired t-test, Wilcoxon rank sum test and linear regression.

Results: Mean cohort age was 37.7 +/- 16.7 years. There was no significant difference between pre-ejaculation oxytocin levels or change following ejaculation between age groups. Increased change in oxytocin correlated positively with flaccid penile length (p<.021). On ultrasound, increased oxytocin change correlated negatively with number of BCM contractions (p<.007). Oxytocin change was negatively correlated with BCM thickness at minimum and maximal distension during ejaculation (p<.05).

Conclusion: This study is the largest available regarding oxytocin levels in humans, and the first to correlate oxytocin with ultrasonographic parameters during ejaculation. Oxytocin levels do not change significantly post-ejaculation and is not different at baseline in younger compared to older men. Increased post-ejaculatory oxytocin did correlate with flaccid penile length. Increased post-ejaculatory oxytocin correlated inversely with BCM contractions, and BCM thickness during ejaculation. The role of oxytocin in sexual arousal and ejaculation as well as utility of supplemental oxytocin requires additional study.

DOES INCREASED AGE HAVE NEGATIVE IMPACT ON ORGASM?
Ali Dabaja, MD, Matthew Wosnitzer, MD, Alexander Bolyakov, MSc and Darius Paduch, MD, PhD
Department of Urology, Weill Cornell Medical College, New York, NY
(Presented By: Ali Dabaja, MD)

Introduction: Attempts to define the different subcategories of ejaculatory and orgasmic function resulted in gaining knowledge about male sexual function. However, understanding these functional changes with age is not thoroughly investigated. The aim of this study is to investigate the associations of age, penile length, quality of orgasm, and ejaculatory functions between men under the age of 40 and over 40.

Methods: We evaluated 50 healthy subjects for orgasmic, erectile, ejaculatory function, sexual history using self-administrated questionnaires, and ultrasound measurement. 25 subjects were in group A (age <40 yo) and 25 subject were in group B (age >40 yo). Quality of orgasm was measured using a linear scale of 1 – 10, force of ejaculation was graded using a point system. Assessment was repeated in 6 weeks on 20% of subjects for validation.

Results: The mean length of flaccid penis was different between the two groups, 12.4 cm (+/-2.7) in A, and 14 cm (+/-2.56) in B (P<.05). However, there was no statistical difference in the length of rigid penis shaft. No difference was found in quality of orgasm; the mean satisfaction score was 6.88 in A, and 7.62 in B. No difference in the force of ejaculation between the two groups. There was a significant difference in the semen volume between the two groups the mean volume was 3.3(SD +/−2.0 ml) in A vs. 2.5 ml (SD +/−1.5) in B (p<.04). The mean weekly sexual activity for A was 5.4 (95% CI, 4.47–6.25) and 5.8 (95% CI, 4.79–6.8) for B with no statistically difference. Force of ejaculation and quality of orgasm were negatively correlated R2=22% (p=0.017). The overall intravaginal ejaculatory latency time was 13.5 minutes (95% CI, 9.6 – 17.4), and masturbation ejaculatory latency time was 8.2 minutes (95% CI, 5.22 – 11.2) with no difference between the groups. The cohort that repeated the study did not have difference between their evaluation.

Conclusions: The findings highlight that men > 40 yo do not exhibit a decrease in their erect penis length, quality of orgasm, force of ejaculation when compared to younger men. Moreover, among men without erectile dysfunction the frequency of sexual activities stays the same over age.
90

THE RELATION OF THE CONSTRICITIVE BAND TO THE PENILE CIRCUMFERENCE
Joon Yong Kim and P.B.M. Kim Mr
Philip and Paul Medical Institute
(Presented By: Joon Yong Kim)

Introduction and Objectives: The penile constrictive band is commonly observed on the penis of men who were not circumcised. In the event that a serious constrictive band was created clinically, it is often observed that circumference around the band is thinner than other areas. The authors aim to report the influence of constrictive bands on the penile circumference of men who were not circumcised.

Methods: The circumference of the penis was measured in three areas: it was measured at the back of the distal penis that is 1.5 – 2.0 cm from the glans corona; on the constrictive band area and on the front area of the proximal penis that is 1.5cm from the penopubic junction.

Results: The number of subjects were 18 and the average age was 41.6 years old. As to the circumference of the three measured areas, it was 7.4 cm of the penile distal area; 7.1 cm of the constrictive band area; and 7.9 cm of the penile proximal area. The circumference of the proximal area was longer than that of the distal area.

Conclusions: This study confirmed a decrease in the circumference of the constrictive band. Although more research is required to confirm these conclusions, considering the possibility that a serious constrictive band may deter the growth of the penis, circumcision may be considered in a positive light in order to insure preventive effects. Furthermore, the circumference of the distal penis is shorter than that of the proximal penis in phimosis.

91

INVESTIGATION OF GALECTIN-3 BINDING LIGANDS IN HUMAN SEMINAL PLASMA USING A PROTEOMIC APPROACH
Matthew Kovak, MS, Sarika Saraswati, PhD and Alan Diekman, PhD
Department of Biochemistry and Molecular Biology College of Medicine University of Arkansas for Medical Sciences
(Presented By: Matthew Kovak, MS)

Background: Galectin-3 is a β-galactoside binding protein with immunomodulatory and cell adhesion functions. The multivalent galectin-3 molecule exerts its extracellular functions via interactions with glycoconjugate ligands. The aim of the current study was to identify galectin-3 binding ligands in human seminal plasma towards understanding the function of galectin-3 in semen.

Methods: Galectin-3 ligands in seminal plasma were isolated by galectin-3 affinity column chromatography. Candidate ligands were identified by tandem mass spectrometry (MS/MS). Biochemical methods were used to characterize the ability of galectin-3 to bind its ligands.

Results: The candidate galectin-3 ligands identified included prostate specific antigen (PSA), prostatic acid phosphatase (PAP), zinc alpha-2-glycoprotein (ZAG), aminopeptidase N (CD13), angiotensin converting enzyme, prostaglandin H2-D-isomerase, clusterin, attractin, and mucin 6 (MUC6). PSA, PAP, ZAG, CD13, and MUC6 were chosen for further analysis based on their prevalence in the affinity-purified sample, relevance to normal reproductive function, and/or lack of previous identification as galectin-3 binding ligands. One-dimensional electroblot analysis of seminal plasma demonstrated that PSA, PAP, ZAG, and CD13 immunoreactivity co-migrated with galectin-3 reactive protein bands. Two-dimensional electroblot analysis identified PSA, PAP, and ZAG immunoreactivity at expected pIs and molecular weights, and immunoreactive spots co-migrated with the galectin-3-reactive protein spots. Inhibition assays with lactose and asialofetuin demonstrated that CD13, PAP, and ZAG interact with galectin-3 in a protein-carbohydrate manner, while PSA may interact with galectin-3 in both a protein-carbohydrate and protein-protein manner.

Conclusions: These results suggest that galectin-3 is involved in the normal reproductive functions of semen liquefaction and sperm motility due to its interactions with PSA, PAP, and ZAG. Significantly, galectin-3 may be involved in infection with human immunodeficiency virus and cytomegalovirus due to its interaction with PAP and CD13. Furthermore, our results indicate that galectin-3 may be a component of a previously described high molecular weight protein aggregate in seminal plasma that contains PSA, PAP, and ZAG. The identification of these glycoproteins as galectin-3 ligands lays the groundwork for future studies of galectin-3 function in reproduction and sexually transmitted infections.
ROLE OF THE ATP-DEPENDENT LON PROTEASE IN PROSTATE CANCER CELL DEATH
Venkatesh Sundararajan, MPharm, PhD and Carolyn Suzuki, PhD
New Jersey Medical School, UMDNJ
(Presented By: Venkatesh Sundararajan, MPharm, PhD)

Introduction and Objectives: Prostate cancer is the second leading cause of death in American men and both the diagnosis and treatment of prostate cancer is poorly understood. Little information is available on the role of mitochondria in prostate cancer. This work is aimed at understanding the role of the mitochondrial ATP-dependent protease Lon in prostate cancer cell survival and also the effect of the electrophilic triterpenoid 2-cyano-3,12-dioxooleana-1,9(11)-dien-28-oic acid (CDDO), in mediating prostate cancer cell death possibly by inhibiting Lon.

Materials and Methods: Prostate cancer cells (PC3) were transiently transfected with Lon and control siRNAs. Cells were treated with CDDO (0 to 10 micromolar) for 24 hrs and immunoblotted for Lon, ClpXP and apoptotic markers. Metabolic function of PC3 cells in response to CDDO was measured using Seahorse XF-24 technology to determine the oxygen consumption rate (OCR) and extracellular acidification rate (ECAR).

Results: CDDO at 2.5 micromolar concentration decreased OCR rate (Figure 1) in PC3 cells immediately after treatment. CDDO treatment of PC3 cells led to apoptosis showing increased levels of cleaved poly(ADP-ribose) polymerase (PARP), cleavage of pro-caspase 3, and pro-caspase 8. Lon siRNA knockdown led to PC3 cell death by contrast to siRNA control transfections. However, the cell death mechanism remains to be determined. In vitro biochemical studies showed that CDDO at IC50 3.2 micromolar inhibits the protease activity of Lon by a novel mechanism, which is independent of its proteolytic active site.

Conclusion: CDDO induced PC3 cell death possibly by altering mitochondrial metabolism and/or inducing apoptosis. Inhibition of the Lon protease may contribute to PC3 cell death. Further detailed studies are required to address these issues.

DIFFERENTIAL UPREGULATION OF GLYCOLYTIC ENZYMES IS AN UNDERLYING FACTOR IN LEUKOCYSTOSPERMIA RESPONDING TO ANTIBIOTIC THERAPY
Sruti Chandra, PhD, Zakaria Abd Elmageed, PhD, Asim Abdel-Mageed, PhD, Wayne Hellstrom, MD, FACS and Suresh Sikka, PhD
Tulane University School of Medicine, New Orleans, LA
(Presented By: Sruti Chandra, PhD)

Introduction and Objectives: Prostatitis and leukocytospermia cause oxidative stress and associated male factor infertility. Treatment with antibiotics often results in improved semen parameters and sperm quality, but not in all patients. We have previously documented differential cytokine and protein expression in ANR compared to AR to such therapy. This study further elucidates the molecular pathway underlying this differential drug response.

Methods: Semen samples, collected with consent from age-matched non-leukocytospermic (NLS) and leukocytospermic (LS) patients and normal donors (ND) were evaluated for semen parameters and leukocyte concentration using WHO (1992) guidelines. Seminal plasma (SP) from LS and NLS samples were incubated with washed sperm and evaluated for motility at various time intervals. Also, SP from AR, ANR and ND was subjected to SDS-PAGE and to LC/MS/MS analyses to determine differential protein expression. Different gene targets of differentially expressed proteins were examined by RT-PCR using RNA extracted from leukocytes isolated by a double percoll gradient from semen samples of AR and ANR.

Results: Reduction in donor sperm motility with SP from both AR (39%) and ANR (42%) LS patients were observed when compared to ND (25%) SP. This implies that leukocytes are the source of molecular factors affecting sperm motility. A significant difference in protein expression (35 – 70kDa) was observed by SDS-PAGE between AR and ANR LS patients but not between AR and ND. Subsequent LC/MS/MS showed upregulation of selective proteins related to carbohydrate metabolism in AR (eg. glycolytic enzymes and dehydrogenases related to polyol pathway). The ANR seminal plasma also showed selective upregulation of anti-inflammatory and anti-cancerous proteins Annexin A1 and Ezrin (important in drug resistance). RT-PCR confirmed the upregulation of selective genes related to glycolytic pathway and dehydrogenases related to polyol pathway and anti-inflammatory Annexin A1 in ANR compared to AR.

Conclusions: Protein components originating from leukocytes in SP of ANR may be responsible for reduced semen quality, especially sperm motility. It is possible that glycolytic pathway proteins are selectively upregulated in ANR, resulting in enhanced energy requirements that affect drug efflux and drug detoxification.
94

A NEW WAY FOR THE TREATMENT OF BLADDER INVASIVE ADENOSQUAMOUS CARCINOMA OF THE PROSTATE: RADICAL CYSTOPROSTATECTOMY

Haifeng Wang, Xu Gao, MD and Yinghao Sun, MD
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(Presented By: Haifeng Wang)

Introduction: We reviewed 50 cases of adenosquamous carcinoma of the prostate (ASCP) that have been reported in the English-language literature and reported 1 case of a bladder invasive ASCP. Our case brings the total reported to 51 and provides a new treatment option for the bladder invasive ASCP.

Methods: A 49 year old man with complaint of obstructive urinary symptoms and elevated prostate-specific antigen level was diagnosed ASCP by needle biopsy of the prostate. In view of negative metastasis detected by PET-CT and bone scan except bladder neck invasion, the patient was performed cystoprostatectomy and pelvic lymph node dissection. Until now, we have not found any sign of recurrence or tumor progression.

Results: Fifty-one cases were summarized. In the 29 cases which had the staging information, there were 18 localized, 2 bladder invasive, and 9 metastatic ones. Among the 11 patients who were performed radical prostatectomy, the 1-, 3- and 5-year cancer specific survival rates were 71.8%, 71.8% and 57.3% respectively. In the 2 cystoprostatectomy cases, one died 5 months after the surgery and the other one had survived 2 years. Among the 33 cases which could be involved in the survival analysis, the 1-, 3- and 5-year cancer specific survival rates were 53.8%, 34.7% and 29.1%.

Conclusion: Our findings support the theory that both squamous and glandular components differentiate from the pluripotent stem cell. And cystoprostatectomy might be a curable treatment for the bladder invasive ASCP without lymph node metastasis and distant metastasis.

Fig 1  CT scan of prostate adenosquamous carcinoma. The arrow marked the prostate mass which invade bladder and cause left hydronephrosis.
Fig 2  Immunohistochemical staining of the specimen.
Fig 3  Surgical specimen. The arrow marked a prostate mass which invade bladder.

95

INCREASE OF SPERM DNA FRAGMENTATION WITH AGE IN CLINICAL PATIENTS

Don Evenson, PhD, HCLD, Jennifer Christianson, AAS and Kay Kasperson, BS
SCSA Diagnostics
(Presented By: Don Evenson, PhD, HCLD)

Introduction: SCSA data were obtained in a previous study on 97 healthy men ages 22 – 90 (Wyrobek et al PNAS 103:9601). 20’s age men had a mean 20% DFI. The mean %DFI had incrementally increasing values reaching a clinical threshold of 30% DFI at age 56.9. 11/12 men above age 60 had >30% DFI. %DFI vs. age was significant (r=0.72 <0.01). A significant (decreasing) linear relationship (P < 0.001) was observed for %HDS vs. age

Methods: n= 3044 men of couples seeking clinical infertility evaluation. Routine semen collection was done with instructed 2 – 5 days abstinence and frozen aliquots were sent to our SCSA Diagnostic center.

Results: The mean and (maximum) values for % moderate DFI, % high DFI, % total DFI and % HDS were: 10.4 (67.2), 10.4 (69.20), 20.87 (96.8) and 11.3 (53.9) respectively. For each year of age increase, the average total %DFI increased by 0.6%. (P < 0.001). Total %DFI was relatively constant at (mean17 %) from age 22 to 38 and then increased significantly from age 39 to 80. The inverse prediction to estimate the ages associated with our current clinical threshold of 25% DFI for natural and IUI conception was age 45.5. Moderate and high %DFI increased in near equal values from age 25 to 58 at which point the %high DFI diverged to higher values. A significant (decreasing) linear relationship (P < 0.001) was observed for %HDS vs. age. All age patients had very significant variations. 29% of patients had values above the 25% DFI threshold for increased statistical risk for natural and IUI conceptions. 14/20 men above 50 yrs.age had > 25% DFI. 5% of men had a >50% DFI.

Conclusions: This is the first large study comparing SCSA parameters of 97 healthy non-patients to 3044 men of couples seeking infertility status. In both studies there were very significant increases over time with sperm DNA fragmentation likely due in large part to natural oxidative stress damage as related to the aging process. Patients were known to have medical factors such as varicocele, high fever, use of medications such as cortisone and SSRI’s, toxicant exposure, infection, and diseases such as cancer and diabetes. The decrease in %HDS in both studies suggest that sperm from older men have a more mature sperm chromatin package including greater exclusion of histones. This may be related to a slowing of spermiogenesis steps in older men. The lower pregnancy success rate for men >50 years of age is likely due in part to damaged sperm DNA.
THE EFFECT OF TYROSINE KINASE INHIBITORS ON MALE REPRODUCTIVE HEALTH AND SPERM FUNCTION
James Smith, MD, MS¹, Olga Syritsyna, PhD², Nam Tran, MD, PhD¹, Mitchell Rosen, MD¹, Liza Jalalian, BS¹ and Polina Lishko, PhD²
¹UCSF; ²UC Berkeley
(Presented By: James Smith, MD, MS)

Introduction and Objectives: In 2007, over 700,000 malignancies were diagnosed in men in the United States. The risk of infertility after cancer treatment is of primary concern for many men who survive these tumors. Tyrosine kinase inhibitors (TKI) are a promising new class of targeted cancer therapies used to treat a number of malignancies. Despite the known effects on male reproductive function of most chemotherapeutic agents, the reproductive effects of agents in the TKI class have not been systematically evaluated.

Methods: In this pilot prospective study of men receiving TKI and in-vitro investigation of fertile volunteers, we determine the effect of TKI on standard semen analysis parameters, quality of life, and functional membrane characteristics of sperm.

Results: We will present data on the in-vitro effect of TKI on normal fertile men and the in-vivo effect in men with cancer undergoing these therapies. TKI therapy had a significant impact on a man’s sexual and reproductive quality of life. Preliminary data suggests that semen analysis parameters may be perturbed by TKI therapy. In-vitro evaluation of a panel of TKI agents revealed differences in sperm capacitation and ion channel function depending on the type of TKI used.

Conclusions: TKI agents may significantly impair sexual and reproductive quality of life for patients. Although it appears some semen parameters may have been affected, the ability of sperm cells to undergo capacitation may be most affected by TKI. Further, our data suggest a complex relationship between sperm tyrosine kinases, sperm capacitation and functioning of sperm ion channels.

THE PROTEOME OF HUMAN SPERM TAIL PROVIDE NEW CLUES TO UNDERSTAND ENDOGENOUS METABOLISM
Alexandra Amaral, PhD¹, Judit Castillo, MSc², Josep Maria Estanyol, PhD³, José Luís Ballescà, MD⁴, João Ramalho-Santos, PhD⁵ and Rafael Oliva, PhD⁶
¹University of Barcelona; ²University of Barcelona, Spain; ³IDIBAPS, Barcelona, Spain; ⁴Barcelona Clinic Hospital, Spain; ⁵CNC, University of Coimbra, Portugal; ⁶University of Barcelona, IDIAPS and Clinic Hospital, Barcelona, Spain
(Presented By: Alexandra Amaral, PhD)

Introduction and Objectives: Proteomic descriptions are adding new insights on our knowledge of human sperm, and more detailed descriptions will certainly suggest additional cellular and molecular attributes. The aim of this study was to perform the first characterization of the human sperm tail proteome, and hopefully identify less concentrated proteins (not found in whole cell proteome studies). Particularly, we were interested in describing the sperm metabolic proteome, to better understand the energetic metabolism of the male gamete.

Methods: Sperm were isolated from normozoospermic semen samples and depleted of any contaminating leukocytes. Tail fractions were obtained by sonication and sucrose-gradient ultracentrifugation, and their purity was confirmed by various techniques. Isolated sperm tail peptides were analysed by liquid chromatography tandem mass spectrometry (LC-MS/MS).

Results: Using this approach, we were able to identify 1049 proteins, half of which had not been previously described in human sperm. The classification of the proteins according to their main function revealed two major groups: proteins involved in metabolism and energy production (26%) and proteins related with sperm tail structure and motility (11%). Notably, a great proportion of the metabolic proteome (24%) were constituted by enzymes involved in lipid metabolism, including enzymes for the mitochondrial beta-oxidation of saturated and unsaturated fatty acids. Surprisingly, we have also identified various peroxisomal proteins, some of which known to be involved in the beta-oxidation of very long chain fatty acids. The presence of peroxisomal proteins in sperm midpiece was confirmed by immunocytochemistry and western blotting. Additionally, analysis of our data using Reactome suggested that both mitochondrial and peroxisomal fatty acids pathways might in fact be active in sperm. In accordance, inhibition of fatty acids oxidation using etomoxir resulted in significant decreases in sperm motility (without significantly affecting sperm viability).

Conclusion: Contradicting a common concept in the literature, we suggest that the male gamete may have the capacity to obtain energy from endogenous fatty acids pools, and thus to adapt to putative exogenous fluctuations.
ABSTRACTS

98

EXPRESSION, BIOCHEMICAL AND FUNCTIONAL CHARACTERIZATION OF RECOMBINANT MURINE BINDER OF SPERM PROTEIN HOMOLOG 2 (REC-BSPH2)

Geneviève Plante, BSc and PuttaSwamy Manjunath, PhD
University of Montreal

(Presented By: Geneviève Plante, BSc)

Introduction and Objectives: Capacitation is a maturation step that is deemed to be essential for sperm to fertilize oocytes. A family of proteins, the Binder of SPerm (BSP), are known to bind choline phospholipids on sperm membranes and thus promote capacitation in many species. Recently, BSP-homologous genes have been identified in humans, primates and rodents. Interestingly, in these species BSP genes are expressed in epididymis rather than in seminal vesicles. BSP genes in human (BSPH1) and mice (BspH1, BspH2) have been cloned and characterized. The objective of the current study was to determine if BSPH2, the other murine BSP protein homolog, plays a role similar to the recombinant BSPH1 (rec-BSPH1) in sperm function.

Methods: A recombinant BSPH2 (rec-BSPH2) was expressed in Rosetta-gamiB(DE3)pLysS cells a pET32a vector. A highly pure and correctly refolded rec-BSPH2 was obtained using immobilized metal ion affinity chromatography and on-column refolding with decreasing urea gradient (6 – 0 M).

Results: The biochemical and functional studies revealed many differences between rec-BSPH2 and rec-BSPH1. Results show that similarly to rec-BSPH1, rec-BSPH2 can bind to heparin, gelatin and sperm membranes but, surprisingly, cannot bind to phosphatidylcholine-liposomes. Immunolocalization of rec-BSPH2 on sperm surface show that similar to rec-BSPH1, it can be found on the acrosomal and midpiece region of the sperm but rec-BSPH1 binds to the anterior acrosomal region whereas rec-BSPH2 binds to the equatorial segment of the acrosome. Finally, the effect of rec-BSPH2 on sperm capacitation was tested.

Conclusion: The preliminary results suggest that unlike rec-BSPH1, rec-BSPH2 is unable to promote sperm capacitation.

Funding: Supported by NSERC and CIHR

99

SPECIAL RESEARCH METHODS FOR PROVING AZOOSPERMIA: COMPARISON BETWEEN CYTOSPIN AND ULTRACENTRIFUGATION TECHNIQUE

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(Presented By: Patricia Pieri, PhD)

Introduction and Objectives: The confirmation of azoospermia is indicated for proper reproductive orientation of infertile man. The centrifugation method of cell suspension on slides (Cytospin) is widely used for this purpose, although not always easy to identify isolated sperm heads due to the large amount of cellular debris. The objective was to compare the Cytospin method with Ultracentrifugation technique developed in our laboratory for proving azoospermia.

Methods: We included semen of patients of reproductive age with a diagnosis of non-obstructive azoospermia in two semen routine analyzes, according to the World Health Organization criteria (WHO, 2010). A special search for proving azoospermia was done by one of the two methods: 1) Cytospin – special equipment that applies rotational force directly to a slide containing the sample to be analyzed, 2) Ultracentrifugation, method developed by our group, which consists of double processing of seminal samples by microultracentrifugation. The slides were then fixed, stained with NF-PICS and analyzed by light microscopy for the following parameters: sperm morphological integrity and amount of cellular debris. We excluded samples in which there was confirmation of azoospermia.

Results: A total of 22 samples were included in the study, seven samples were submitted to cytospin and 15 to ultracentrifugation. Statistical difference was observed comparing the two methods: [1] The integrity of sperm: 72% of the Cytospin samples showed non intact sperm (either no tail and/or middle piece), versus 100% in intact sperm obtained by the ultracentrifugation method (p = 0.003), [2] Cellular debris: found in 100% of samples processed by Cytospin and only 28% of those obtained by ultracentrifugation (p = 0.002).

Conclusion: The ultracentrifugation method showed to be as effective as the Cytospin. Moreover, the ultracentrifugation method developed is simpler, of much less cost and has the additional advantage of ease and straightforward interpretation due to sperm integrity and slides without cellular debris.

Table 1: Comparison between Cytospin and Ultracentrifugation technique

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<th>Cytospin (n=7)</th>
<th>Ultracentrifugation (n=15)</th>
<th>p</th>
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<tr>
<td>Integrity of spermatozoa</td>
<td>2 (28%)</td>
<td>11 (73%)</td>
<td>0.003</td>
</tr>
<tr>
<td>Cellular Debris</td>
<td>7 (100%)</td>
<td>9 (60%)</td>
<td>0.002</td>
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ABSTRACTS

100

ENHANCEMENT OF SPERM IDENTIFICATION BY OBSERVATION OF RESUSPENDED PELLETS IN MICRO DROPS SUPPLEMENTED WITH PENTOXIFYLLINE: ASSESSMENT OF SPECIMENS PREVIOUSLY CLASSIFIED AS AZOOSPERMIC (NON-OBSTRUCTIVE)
Juan Correa-Perez, PhD¹, Samuel Marynick, MD¹ and Pedro Beauchamp, MD²
¹Texas Center for Reproductive Health; ²Puerto Rico Fertility Center
(Presented By: Juan Correa-Perez, PhD)

Introduction and Objectives: The aim of this study was to maximize the probability of finding spermatozoa in specimens previously classified as azoospermic, following confirmation of NOA via centrifugation/reconstitution techniques.

Methods: Fresh semen specimens from 8 NOA patients were re-evaluated following at least 2 negative semen analyses. Semen samples were observed via wet-mount analysis, followed by centrifugation and reconstitution of pellets into 0.1 ml of seminal plasma or culture media. The reconstituted specimen was split into 2 aliquots. Portions of each aliquot (10 ul) were added to microdrops (30 ul) of culture media supplemented with or without pentoxifylline (PXF; 1mg/ml) and covered with mineral oil. Sperm activity was assessed by scanning the drops under an inverted microscope (200 to 400x) continuously for the first 30 min, and then at 15 min intervals for up to 2 hrs.

Results: Enough spermatozoa to perform IVF with ICSI was found in 4 patients, which had a normal reproductive endocrine profile. The other 4 patients had an abnormal endocrine profile (high FSH and LH) and no sperm cells were observed after 2 hrs. Initial sperm activity was observed within 1 – 5 min post-exposure to PXF, and continued increasing during the first 30 min of observation. Furthermore, the majority of the sperm cells were observed swimming around the edge of the microdrops supplemented with PXF. Specimens exposed to microdrops without PXF supplementation, sperm activity was observed in the specimen from 1 patient, but less numbers of reactive (motile) sperm were observed.

Conclusion: In conclusion, our results indicate that it is possible to enhance the identification of sperm after an initial diagnosis of NOA via the traditional centrifugation/reconstitution method. Thus far our modified technique seems to be a viable option for patients with a normal endocrine profile. In these cases the sperm numbers seem to be extremely low and may not be detected by searching on a microscope slide. Furthermore, sperm cells in these specimens have a tendency to be immotile, which makes difficult their identification via traditional methods. Exposure to PXF activates sperm motility and motile sperm have a preference for swimming around the edge of drops, which facilitates their observation. Sperm banking can be performed for additional specimens in order to harvest enough spermatozoa for use in IVF/ICSI.

101

THE STUDY ON THE CARNITINE CONCENTRATION IN THE SEMEN PLASMA OF THE NORMAL SPERM MOTILITY AND ASTHENozoospermia IVF-ET MALE POPULATION ACCORDING TO THE NEW 5TH WHO MANUAL SEMEN PARAMETER REFERENCE VALUES
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(Presented By: Hongjie Liu)

Introduction and Objectives: To investigate the clinical meaning of the carnitine level in the infertility male population by detecting the carnitine concentration in the semen plasma and comparing the carnitine level in the semen plasma of the normal sperm sample and asthenozoospermia sample according to the new 5th WHO manual semen parameter reference values.

Methods: The semen analysis were detected by computer-assisted semen analysis system, 1175 cases male patients were divided into two groups according to “WHO laboratory manual for the examination and process of human semen( the fifth edition)”, the normal sperm motility group (Progressive motility ≥32%), 283 cases; Asthenozoospermia group (Progressive motility <32%), 892 cases. The carnitine level in semen plasma and the correlation between the caritine level and sperm concentration were compared in the two groups. The male in normal sperm motility group were identified that the infertility were due to the male factor such as tubal impatency etc. al. The members in asthenozoospermia group were excluded if recheck semen analysis results were normal.

Results: The result showed that carnitine level of asthenozoospermia group 1/2 384.14±188.81μmol/L (%), was significantly lower than the normal sperm motility group’s 1/2 434.04±171.77μmol/L (%), P<0.01. There was a weak positive correlation between the carnitine level and the percentage of sperm with progressive motility, r = 0.202, P < 0.01. There was no correlation between the carnitine level and the percentage of sperm with progressive motility in the normal sperm motility group, however, there was a weak positive correlation between the carnitine level and the percentage of sperm with progressive motility in the asthenozoospermia group, r = 0.176, P < 0.01. There was a weak positive correlation between the carnitine level and sperm concentration, r = 0.176, P < 0.01. Both normal sperm motility group and asthenozoospermia group showed weak positive correlation between the carnitine level and sperm concentration (r = 0.127, P < 0.05).

Conclusion: According to “WHO laboratory manual for the examination and process of human semen (the fifth edition)” criteria, the detection of carnitine level maybe one of the significant factor for the Asthenozoospermia.
102

RELATIONSHIP BETWEEN THE TOTAL NORMAL FORMS AND PROGRESSIVE MOTILITY SPERM NUMBER (TNPS) AND THE OUTCOME OF IN VITRO FERTILIZATION (IVF)
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(Presented By: Hongjie Liu, Master)

Objective: To investigate the relationship between the total normal forms and progressive motility sperm number (TNPS) and the outcome of the in vitro fertilization (IVF). To understand the clinical significance of the new semen parameter TNPS in male infertility therapy and diagnosis.

Methods: We analyzed the average TNPS during three months before IVF in 1972 couples who accepted their first IVF-ET cycle and detected the effects of TNPS on the fertilization rate, poly-PN rate, cleavage rate, good embryo rate and pregnancy rate.

Results: Among different TNPS groups, there was no statistical difference in the poly-PN rate, cleavage rate, good embryo rate and clinical pregnancy rate, but statistical difference in the fertilization rate. The fertilization rate increased significantly as the TNPS increased. When the TNPS<1.8×10⁶/mL, the percentage of abnormal fertilization patient whose IVF fertilization rate is lower than 30% (or 50%) is up to 13.80% (or 26.10%).

Conclusion: The TNPS could be as an independent evaluating indicator of semen quality in assisted reproductive technology (ART) therapy. For those patients whose TNPS<1.8×10⁶/mL, half-ICSI or ICSI could be performed to avoid IVF failure.

102.5

PRECONCEPTION SEMEN QUALITY AND TIME-TO-PREGNANCY, LIFE STUDY
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(Presented By: Steven Schrader)

Introduction and Objectives: Time-to-pregnancy (TTP) is a proxy of couple fecundity recognizing the importance of male factors for pregnancy. There are few studies that have assessed semen quality prior to conception in couples prospectively followed while attempting to become pregnant. The Longitudinal Investigation of Fertility and the Environment (LIFE) Study was designed to fill this critical data gap.

Methods: A cohort of 501 couples discontinuing contraception to become pregnant was observed for 12 months of trying or until a pregnancy. Following enrollment, men were asked to abstain from intercourse for 2 days and collect a semen sample via masturbation with a second sample collected the following month irrespective of whether the couple became pregnant. Semen samples were kept at refrigerated temperature and shipped by next day delivery to a central laboratory where semen analyses, computer-assisted sperm analyses and the sperm chromatin structure assays were conducted, with ongoing quality assurance and control procedures. Fecundability odds ratios (FORs) and corresponding 95% confidence intervals (CIs) were estimated for each semen endpoint in relation to TTP. Final models accounted for repeated semen measures and adjusted for couples’ ages, body mass index (BMI), serum cotinine, abstinence, and enrollment site.

Results: Men averaged 31.7 years with a mean BMI of 29.7. Mean sperm concentration, 24-hour motility, strict morphology, traditional morphology, and DNA fragmentation index (DFI) were: 73.8 (x10⁶/mL), 12.2%, 20.1%, 30.4%, 15.3%, respectively. FORs >1 denote enhanced fecundity (shorter TTP) and were observed for sperm concentration and total count, % hypo-osmotic swollen, % motility, % elongation, % acrosome head area, % strict and % traditional morphology, and sperm head width. Semen endpoints positively associated with a FOR <1 (longer TTP) included: % amorphous, % round, % coiled tail, % cytoplasmic droplet, and % DFI. When modeling all significant semen endpoints along with covariates, only % coiled tail, male age and female BMI were significantly associated with a FOR <1.

Conclusions: While several semen endpoints were significantly associated with TTP, most findings disappeared when jointly modeling endpoints in the context of other covariates. These novel findings underscore the importance of biological variability and lifestyle when modeling semen quality relative to couple fecundity by TTP.
### ABSTRACTS

#### SPERMATOGENESIS / STEROIDOGENESIS / TESTIS BIOLOGY

**103**

**LATE REPRODUCTIVE ANALYSIS OF MALE RAT OFFSPRING EXPOSED TO NICOTINE DURING PREGNANCY AND LACTATION**

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(Presented By: Mayra Miranda Rodrigues, Master’s Student)

**Introduction and Objectives:** Around one-third of the world population smokes and 10.4% of pregnant women report smoking during pregnancy in the United States and Europe. Nicotine (Ni), a component of cigarettes, reaches the maternal milk and is able to cross the placental membrane. It inhibits steroidogenesis, suppresses testosterone secretion and causes erosion dysfunction, testicular atrophy and infertility. Formerly, our group observed that Ni, when injected in rats during whole pregnancy and lactation periods, provokes, in the progeny, late morphofunctional alterations of Leydig cell, body weight increase as well as changes of cholesterol and testosterone plasma levels in adulthood (90th day post-partum – dpp); an evident injury of the seminiferous epithelium also occurs. With the aim to investigate whether the spermatogenic damage observed in 90dpp progenies from Ni-exposed pregnant and lactating rats are maintained or whether it is worsen in older rats, we propose to investigate the testicular morphology of these litters after two complete periods of spermatogenesis (53 days each), as well as to evaluate their spermatic parameters and sperm DNA fragmentation.

**Methods:** Pregnant and lactating rats were Ni-exposed (2mg/Kg/day) through an osmotic minipump implanted at the first day of pregnancy, which was replaced just after birth and removed at the weaning day. Control (no minipump implanted) and Sham (minipumps without Ni) groups were established. Plasma and milk Ni levels were obtained at 22dpp (chromatography). The offspring was killed at 90, 143, 196dpp.

**Results:** The progenies did not show significant alterations of the testis and epididymis volume and weight and body weight. The count of mature spermatids (step 19) and sperm daily production per testis as well as the sperm number and transit time through the epididymal caput/corpus and cauda did not also show significant changes. Testicular and epididymal histological study, plasmatic levels of cholesterol, luteinizing and sex hormones, sperm motility, mitochondrial activity and DNA fragmentation (Comet Assay) are also being evaluated. In addition, offspring from mothers exposed to Ni of all ages showed a significant high frequency of morphologically abnormal spermatozoa.

**Conclusion:** This indicates low sperm quality from nicotine exposition. Further studies are being carried out to confirm this.

**104**

**THE EFFECTS OF ANTIOXIDANTS ADMINISTRATION IN THE UNILATERALLY CRYPTOCHIDIZED RAT MODEL**

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(Presented By: Panagiota Tsounapi BS)

**Introduction and Objectives:** Cryptorchidism is a common anomaly of the male genitalia, affecting 2 – 4% of male infants. We investigated whether there is a beneficial effect of antioxidant treatment in the damage induced by unilateral cryptorchidism in the rat model.

**Methods:** Six-week-old male Wistar rats were randomly separated in five aged-matched groups. We induced unilateral cryptorchidism in the right testis of four groups. One group was treated with saline intraperitoneally (i.p.) (group A), one group with taurine 500 mg/kg i.p. (group B), one group with catalase 50 μg/kg injected i.p. (group C) and another with sivelestat 15 mg/kg i.p. (group D). One last group was used as a control, treated with saline i.p. The treatment was daily and lasted eight weeks. Five days before sacrifice, mating studies were performed. Body, testicular, epididymal weights, malondialdehyde (MDA) levels in the seminal fluid (SF) and the 8-Hydroxy-2'-deoxyguanosine (8-OH-dG) were measured. Histological examination and the Johnsen score were used to observe and evaluate the morphological changes in the testes. TUNEL assay was used to examine DNA fragmentation.

**Results:** The right testes and epididymis weights in cryptorchidized groups were significantly lower compared to the control. There was no significant difference in the body and left testicular and epididymal weights among the groups. MDA levels in the SF were significantly elevated in groups A and C compared to the control. Sivelestat significantly decreased them. Testicular 8-OH-dG levels were significantly elevated bilaterally in group A. Treatment with catalase and taurine significantly protected DNA oxidative damage in the right testes. Left testis 8-OH-dG levels were significantly lower in groups B, C, and D compared to group A. Histological score revealed a slight to mild injury in the unilateral testes of groups A, B, C, and D compared to the control. Treatment with all antioxidants significantly decreased the TUNEL score bilaterally compared to group A, but it was still significantly higher than the control. Newborns were delivered by all groups.

**Conclusion:** Present data demonstrate that unilateral cryptorchidism-induced testicular damage can significantly affect the contralateral testis as well. Treatment with antioxidants can partially improve this damage bilaterally.
ROLE OF WSX-1 IN THE CYTOPROTECTIVE ACTION OF THE MITOCHONDRIAL PEPTIDE, HUMANIN, ON MALE GERM CELLS

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Introduction: We have previously demonstrated that intratesticular administration of synthetic humanin (HN) in rats rescues GnRH-antagonist (GnRH-A) or IGFBP-3 induced male germ cell apoptosis. Humanin has been proposed to signal via a trimeric neurocytokine receptor composed of WSX-1, CNTFR, and GP130. We recently showed that synthetic HN peptide prevents heat-induced germ cell apoptosis via receptors containing GP130/WSX-1 subunits in an ex vivo seminiferous tubule culture system. To further explore the role of WSX-1 in the cytoprotective actions of HN on male germ cells, we studied the effect of heat on germ cell apoptosis in WSX-1 knockout mice.

Methods: Groups of 4 – 6 adult (12 – 20 weeks old) wild type (WT) and WSX-1 knockout (C57BL/6JN) mice were randomly divided into four groups: 1) vehicle (control group); 2) a single intra-peritoneal (IP) injection of pharmacological doses of synthetic HN (40mg/kg BW) peptide (HN group); 3) testicular hyperthermia 43C for 15 minutes (Heat group); 4) Testicular hyperthermia plus IP injection of HN (Heat+HN group). All animals were euthanized 6 hours after treatment. Germ cell apoptosis were assessed by TUNEL assay and quantified by apoptotic germ cells per Sertoli cells. The interaction between HN and WSX-1 was determined by dot blots and co-immunofluorescence assays.

Results: Testicular hyperthermia increased germ cell apoptosis primarily at early and late stages of seminiferous epithelial cycles in WT (0.79±0.10, TUNEL positive germ cell/Sertoli cell; p<0.01 compared with WT control group, 0.17±0.03) mice. Heat-induced germ cell apoptosis was partially inhibited by synthetic HN administration in WT (0.38±0.05, p<0.01). In WSX-1 knockout mice, heat also induced germ cell apoptosis (0.77±0.10; p<0.01 compared with knockout control group, 0.09±0.02) mainly at early and late stages but HN was not effective in preventing heat induced apoptosis (0.56±0.06, p>0.05 compared with heat treatment group). Dot blots showed the interaction of HN peptide and WSX-1 peptide in vitro.

Conclusion: Studies in WT and WSX-1 knockout mice demonstrate that: 1) the anti-apoptotic effect of exogenous HN at superphysiological dose on heat-induced male germ cell apoptosis is partially mediated through the membrane receptor subunit WSX-1; 2) the membrane receptor subunit WSX-1 may be important for superphysiologic HN actions on governing the fate of germ cell survival and death in testes.

IDENTIFICATION OF A NOVEL TESTICULAR MESENCHYMAL STEM CELL POPULATION REQUIRED FOR THE EXPANSION OF HUMAN SPERMATOGONIAL STEM CELLS

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Introduction and Objectives: Spermatogenesis is maintained by an appropriate interaction between spermatogonial stem cells (SSCs) and the various types of somatic cells within the testicular niche. However, little is known about this dynamic relationship. The aim of this study is to investigate the unique cellular niche required for SSC growth.

Methods: Normal adult human testicular tissues were collected and digested into single cell suspensions. SSCs and somatic cell subpopulations were isolated by 5-color flow cytometry, analyzed, cultured, and evaluated for their role in supporting SSC growth.

Results: SSCs, spermatogonia, spermatocytes, Sertoli cells and stromal cells were individually isolated, using a distinct set of extracellular markers and cultured. When purified SSCs were cultured in the presence of different populations of testicular supporting cells or mouse embryonic fibroblasts, testicular stromal cells were found to be absolutely essential for appropriate SSC binding and growth. Without the niche provided by stromal cells, SSCs failed to bind and growth was inhibited. Furthermore, this niche was made up of stromal cells originally derived from a small number individual clones. Specifically, these stromal clones were shown to originate from a novel population of testicular mesenchymal stem cells (MSCs). Interestingly, Sertoli cells were not an essential component of the niche required for SSC growth.

Conclusions: We demonstrated that an appropriate physical interaction between SSCs and the testicular stromal niche is required for SSC growth and expansion. Additionally, testicular MSCs are crucial in this process as they provide and maintain the stromal cells needed in this niche. By identifying the necessary cellular components in the testicular niche required for SSC growth, the findings described here serve as a foundation for future studies aiming at understanding SSC biology and differentiation.
THE CYTOPROTECTIVE EFFECT OF HUMANIN IN MALE GERM CELLS IS INDEPENDENT OF TESTOSTERONE SYNTHESIS

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(Presented By: Prasanth Surampudi, MD)

Introduction and Objectives: We have shown that Humanin (HN), an evolutionary conserved 24 amino acid mitochondrial peptide, protects testicular germ cell from apoptosis induced by GnRH-antagonist (GnRH-A) in vivo and hyperthermia in vitro in rodents. This cytoprotective action of HN on germ cells may be in part due to its effects Leydig cells. In these experiments we attempted to determine if synthetic HN can preserve the synthesis of testosterone (T) from Leydig cells when exposed to ketoconazole (KTZ), a steroidogenic enzyme inhibitor, and ethane-dimethanesulfonate (EDS), a known Leydig cell toxin.

Methods: Leydig Cells were isolated from the testes of mature rats and cultured with and without KTZ (10 ug/ml) for 4 h. or EDS (1 and 2 mM) for 24 h. HN (10 ug/ml). HN was added to treated groups to determine if HN had any protective effect on Leydig cells. To assess the effect of these agents on stimulated steroidogenesis, the cultures were stimulated with hCG (0.1 IU/ml). We measured testosterone (T) levels in the media from cells exposed to KTZ and EDS. We assessed Leydig cell death after exposure to EDS with flow cytometry using Annexin V as a marker of apoptosis and 7ADD as a marker of cell death.

Results: The Leydig cell purity was >90% pure based on 3-beta-hydroxysteroid dehydrogenase staining. KTZ suppressed T production to 26% of baseline and addition of HN did not ameliorate the decrease in T production. KTZ reduced hCG stimulated T production by 95% and this was not changed after addition of HN. Similarly, EDS reduced T production at basal state and after stimulation by hCG. Again HN had no effect on EDS induced reduction in T production. EDS treatment induced a two fold increase in the rate of apoptosis compared to controls. HN was not able rescue Leydig cells apoptosis induced by EDS.

Conclusion: KTZ and EDS reduced basal and hCG stimulated T production by Leydig cells which was not reversed by HN. HN also had no effect on EDS induced Leydig cell apoptosis. This suggests that cytoprotective effect of HN on male germ cells is independent of testosterone synthesis and does not act through the preservation of Leydig cells.
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If you are interested in serving on any of the committees please contact the respective chairs.