



Regulatory Processes Modulating Mammalian Reproduction

August 21 - 26, 2016

Chairs

Anne Croy and Amander T. Clark

Vice Chairs

Humphrey H. Yao and Jon Oatley

Waterville Valley

56 Packard's Road

Waterville Valley, NH, US

Conference Description

We are pleased to announce an informal session to be held on August 24th from 1:30 pm - 3:30 pm titled, "How Can We Contribute to Understanding Zika Virus's Challenges to Human Reproductive Health".

The 2016 Gordon Research Conference on Mammalian Reproduction will be held August 21-26 at Waterville Valley, NH. This conference will address advances in the basic biology of reproductive tract organs, placenta and mammalian germline cells. It will also feature presentations describing the impacts of environmental modulations on reproductive health and on long term health of offspring. The program will be focused on the latest advances in genetics, epigenetics and stem cells, as well as the use of genome editing tools to address the most critical scientific questions in the reproductive system.

The 2016 Gordon Research Conference on Mammalian Reproduction seeks to highlight recent advances in this multidisciplinary field and to also emphasize the translational potential of this work to human and animal health. The conference will reflect the diversity of junior and senior researchers who contribute to the reproductive sciences and medicine. Emphasis will be placed on communicating major recent conceptual and experimental advances in order to spotlight exciting new avenues of investigation. The meeting will be centered upon unpublished data and stimulating, active discussions amongst participants at all levels. We look forward to the inclusion of approximately 12 short talks of 15 minutes each that will be selected from

applicants' abstracts. Poster sessions will be held each of the four full conference days. Graduate students and postdoctoral scientists are encouraged to apply.

Conference Program

Sunday

2:00 pm - 9:00 pm Arrival and Check-in

6:00 pm Dinner

7:30 pm - 7:40 pm Welcome / Introductory Comments by GRC Site Staff

7:40 pm - 9:30 pm **Environmental Impacts upon Reproduction and Offspring Health**

Discussion Leader: **Amander Clark** (University of California, Los Angeles, USA)

7:40 pm - 7:50 pm Introduction by Discussion Leader

7:50 pm - 8:15 pm **Patricia Hunt** (Washington State University, USA)
"The Perils of Making Gametes in the 21st Century"

8:15 pm - 8:25 pm Discussion

8:25 pm - 8:50 pm **Jodi Flaws** (University of Illinois, USA)
"Environmental Chemicals and the Female Reproductive System"

8:50 pm - 8:55 pm Discussion

8:55 pm - 9:20 pm **Douglas Kwon** (Massachusetts Institute of Technology / Harvard University, USA)
"The Role of Genital Inflammation and the Vaginal Microbiome in HIV Acquisition Risk"

9:20 pm - 9:30 pm Discussion

Monday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Genetic Regulation of Reproductive Outcomes**

Discussion Leader: **Margaret (Peggy) Petroff** (Michigan State University, USA)

- 9:00 am - 9:10 am Introduction by Discussion Leader
- 9:10 am - 9:35 am **Kjersti Aagaard** (Baylor College of Medicine, USA)
"Unexpected Beginnings: How the Intrauterine and Maternal Microbial and Metabolic Environments Influence Offspring Health"
- 9:35 am - 9:45 am Discussion
- 9:45 am - 10:10 am **Alex Bortvin** (Carnegie Institution for Science, USA)
"Sex-Specific Strategies and Outcomes of Transposon Control in Germ Cells"
- 10:10 am - 10:20 am Discussion
- 10:20 am - 10:30 am **Wenfeng An** (South Dakota State University, USA)
"The Missing Link Between Retrotransposon Activation and Meiotic Failure in piRNA-Deficient Mice"
- 10:30 am - 10:35 am Discussion
- 10:35 am - 11:05 am Group Photo / Coffee Break
- 11:05 am - 11:15 am **Kathryn Grive** (Cornell University, USA)
"TAF4b Regulates Oocyte-Specific Genes Essential for Meiosis and Primordial Follicle Development"
- 11:15 am - 11:20 am Discussion
- 11:20 am - 11:30 am **Hieu Nguyen** (University of Hawaii at Manoa, USA)
"A New Found Function of the DNA Licensing Protein ORC4 on Polar Body Extrusion"
- 11:30 am - 11:35 am Discussion
- 11:35 am - 12:00 pm **Monika Ward** (University of Hawaii, USA)
"To Be or Not to Be: Essential and Not So Essential Roles of Mouse Y Chromosome Genes in Germline Regulation"
- 12:00 pm - 12:10 pm Discussion

12:10 pm - 12:20 pm **Sylvia Hewitt** (National Institute of Environmental Health Sciences, NIH, USA)
"Negative Elongation Factor Subunit B (NELF-B) Is Essential for Endometrial Function"

12:20 pm - 12:25 pm Discussion

12:25 pm - 12:30 pm General Discussion

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

3:00 pm - 4:00 pm Power Hour

The GRC Power Hour is an optional informal gathering open to all meeting participants. It is designed to help address the challenges women face in science and support the professional growth of women in our communities by providing an open forum for discussion and mentoring.

Organizer: **Margaret (Peggy) Petroff** (Michigan State University, USA)

4:00 pm - 6:00 pm Poster Session

6:00 pm Dinner

7:30 pm - 9:30 pm **Editing the Genes of Gametes and Embryos**

Discussion Leader: **Francesco Demayo** (National Institute of Environmental Health Sciences, NIH, USA)

7:30 pm - 7:40 pm Introduction by Discussion Leader

7:40 pm - 8:05 pm **John Schimenti** (Cornell University, USA)
"Genetic Variation and Human Fertility"

8:05 pm - 8:15 pm Discussion

8:15 pm - 8:40 pm **F. Kent Hamra** (University of Texas Southwestern Medical Center, USA)
"Integrating Genome Editing Technologies into Robust *Rattus norvegicus* Spermatogenesis Colony Forming Assays"

8:40 pm - 8:50 pm	Discussion
8:50 pm - 9:15 pm	Randall Prather (University of Missouri-Columbia, USA) "Editing the Pig Genome for Agriculture and Biomedicine"
9:15 pm - 9:25 pm	Discussion
9:25 pm - 9:30 pm	General Discussion
Tuesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Epigenetic Regulation in Reproduction Discussion Leader: John McCarrey (University of Texas at San Antonio, USA)
9:00 am - 9:10 am	Introduction by Discussion Leader
9:10 am - 9:35 am	Marisa Bartolomei (University of Pennsylvania, USA) "Regulation of Genomic Imprinting in Development and Disease"
9:35 am - 9:45 am	Discussion
9:45 am - 10:10 am	Myriam Hemberger (Babraham Institute, United Kingdom) "Epigenetic and Transcriptional Networks Controlling Trophoblast Stem Cells – The Stepping Stone for Normal Placentation and Reproductive Health"
10:10 am - 10:20 am	Discussion
10:20 am - 10:30 am	Felipe Vilella (Fundación IVI / INCLIVA, Spain) "Maternal Endometrial Hsa-miR-30d Is Necessary for Embryo Implantation"
10:30 am - 10:35 am	Discussion
10:35 am - 11:05 am	Coffee Break
11:05 am - 11:15 am	Steen Ooi (University College London, United Kingdom) "A Novel Role for Microprocessor Component Drosha in Cytosine Methylation"

11:15 am - 11:20 am	Discussion
11:20 am - 11:30 am	Qi Chen (University of Nevada, Reno School of Medicine, USA) "Sperm tsRNAs and RNA Modifications in Diet-Induced Epigenetic Inheritance"
11:30 am - 11:35 am	Discussion
11:35 am - 12:00 pm	Sue Hammoud (University of Michigan Medical School, USA) "Chromatin Dynamics and Its Role in Developing Germ Cells"
12:00 pm - 12:10 pm	Discussion
12:10 pm - 12:20 pm	Christopher Payne (Feinberg School of Medicine, Northwestern University, USA) "Dicer1-Mediated Silencing of INSM1 in Spermatogonia Permits the Expression of PHD Finger Protein 1 and Global Polycomb Group Methyltransferase Activity"
12:20 pm - 12:25 pm	Discussion
12:25 pm - 12:30 pm	General Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<u>Poster Session</u>
6:00 pm	Dinner
7:30 pm - 9:30 pm	Stem Cells in Reproduction Discussion Leader: Wei Yan (University of Nevada School of Medicine, USA)
7:30 pm - 7:40 pm	Introduction by Discussion Leader
7:40 pm - 8:05 pm	Jan Brosens (University of Warwick, United Kingdom) "Endometrial Stem Cell Deficiency and Recurrent Pregnancy Loss"
8:05 pm - 8:15 pm	Discussion

8:15 pm - 8:40 pm	Brian Hermann (University of Texas at San Antonio, USA) "Defining the Mammalian Spermatogonial Stem Cell Pool"
8:40 pm - 8:50 pm	Discussion
8:50 pm - 9:15 pm	Harry Leitch (MRC Clinical Sciences Centre, Medical Research Council, United Kingdom) "Nanog, Pluripotency and the Germline Revisited"
9:15 pm - 9:25 pm	Discussion
9:25 pm - 9:30 pm	General Discussion
Wednesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Bioengineering and Reproductive Health Discussion Leader: Kyle Orwig (University of Pittsburgh, USA)
9:00 am - 9:10 am	Introduction by Discussion Leader
9:10 am - 9:35 am	Daniela Ulrich (Medical University of Graz, Austria) "Bioengineering of the Lower Female Reproductive Tract - New Approaches for Treating Pelvic Organ Prolapse"
9:35 am - 9:45 am	Discussion
9:45 am - 10:10 am	Mats Hellstrom (University of Gothenburg, Sweden) "Uterus Transplantation Followed by Bioengineering of the Uterus"
10:10 am - 10:20 am	Discussion
10:20 am - 10:30 am	Yasushi Hirota (The University of Tokyo, Japan) "STAT3 Promotes Uterine Regeneration in a Mouse Model of Decellularized Uterine Matrix Transplantation"
10:30 am - 10:35 am	Discussion
10:35 am - 11:05 am	Coffee Break

11:05 am - 11:15 am	Chris Geyer (East Carolina University, USA) "Retinoid Catabolism Regulates Spermatogonial Fate in the Mouse Testis"
11:15 am - 11:20 am	Discussion
11:20 am - 11:30 am	Enrique Sosa (University of California, Los Angeles, USA) "Developing a Non-Human Primate Model for Stem Cell and Germline Research"
11:30 am - 11:35 am	Discussion
11:35 am - 12:00 pm	Joanna Burdette (University of Illinois at Chicago, USA) "Engineering the Female Reproductive Tract Using Microfluidics"
12:00 pm - 12:10 pm	Discussion
12:10 pm - 12:20 pm	Ripla Arora (University of California, San Francisco, USA) "Imaging the Implanting Embryo and the Uterine Environment in Three-Dimensions"
12:20 pm - 12:25 pm	Discussion
12:25 pm - 12:30 pm	General Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<u>Poster Session</u>
6:00 pm	Dinner
7:00 pm - 7:30 pm	<u>Business Meeting</u>
	<i>Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair</i>
7:30 pm - 9:30 pm	Reproductive Transcription and Signaling Pathways Discussion Leader: Diana Laird (University of California, San Francisco, USA)

7:30 pm - 7:40 pm	Introduction by Discussion Leader
7:40 pm - 8:05 pm	Blanche Capel (Duke University, USA) "Committing to Testis or Ovary Fate"
8:05 pm - 8:15 pm	Discussion
8:15 pm - 8:40 pm	Shuangbo Kong (State Key Laboratory of Stem Cell and Reproductive Biology, China) "Molecular Determinants of Uterine Receptivity"
8:40 pm - 8:50 pm	Discussion
8:50 pm - 9:15 pm	Aleksandar Rajkovic (University of Pittsburgh, USA) "Reproductive Aging and Overall Health: Is There a Link?"
9:15 pm - 9:25 pm	Discussion
9:25 pm - 9:30 pm	General Discussion

Thursday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Continuing Challenges to Human Reproductive Health Discussion Leader: Xiujun Fan (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China)
9:00 am - 9:10 am	Introduction by Discussion Leader
9:10 am - 9:35 am	Jacquetta Trasler (McGill University, Canada) "Epigenetic Targets of Environmental and Drug Exposures in Germ Cells and Embryos"
9:35 am - 9:45 am	Discussion
9:45 am - 10:10 am	Michal Neeman (Weizmann Institute of Science, Israel) "Recent Developments in MRI Analysis of Maternal Angiogenesis During Early Pregnancy in Mice"
10:10 am - 10:20 am	Discussion

10:20 am - 10:30 am	Ernesto Figueiro-Filho (Federal University of Mato Grosso do Sul, Brazil) "White Matter Diffusion Tensor Imaging (DTI) and Resting State Functional Connectivity (rs-fMRI) Differ in Children Born from Preeclamptic Gestations"
10:30 am - 10:35 am	Discussion
10:35 am - 11:05 am	Coffee Break
11:05 am - 11:15 am	Melissa Pepling (Syracuse University, USA) "Oocyte Survival and Follicle Formation in an Estrogen Deficient Environment"
11:15 am - 11:20 am	Discussion
11:20 am - 11:30 am	Nava Dekel (Weizmann Institute of Science, Israel) "Hyaluronic Acid: Anti-Angiogenic Shield for the Post-Implantation Embryo"
11:30 am - 11:35 am	Discussion
11:35 am - 12:00 pm	Andrew Sharkey (University of Cambridge, United Kingdom) "HLA-KIR Associations in Human Reproductive Success"
12:00 pm - 12:10 pm	Discussion
12:10 pm - 12:20 pm	Gunter Wagner (Yale University, USA) "The Role of Inflammation in the Evolution of Mammalian Pregnancy"
12:20 pm - 12:25 pm	Discussion
12:25 pm - 12:30 pm	General Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 5:30 pm	<u>Poster Session</u>
5:30 pm - 7:30 pm	Keynote Session: Milestones in Reproductive Biology

Discussion Leaders: **Jon Oatley** (Washington State University, USA) and **Humphrey Yao** (National Institute of Environmental Health Sciences, NIH, USA)

5:30 pm - 5:40 pm	Introduction by Discussion Leader
5:40 pm - 6:10 pm	Mitch Eddy (National Institute of Environmental Health Sciences, NIH, USA) "The Ark of Life: The Germ Line - Past, Present and Future"
6:10 pm - 6:25 pm	Discussion
6:25 pm - 6:35 pm	Introduction by Discussion Leader
6:35 pm - 7:05 pm	Marilyn Renfree (University of Melbourne, Australia) "Reproduction Down Under: The 6% Solution"
7:05 pm - 7:20 pm	Discussion
7:20 pm - 7:25 pm	General Discussion
7:25 pm - 7:30 pm	Closing Remarks
8:00 pm	Dinner
Friday	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

Contributors

 Gordon Research Conferences	 Carl Storm Underrepresented Minority Fellowship	 Carl Storm International Diversity Fellowship
		

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