



## Programming and Reprogramming the Vertebrate Germline

### Dates

June 18-23, 2017

### Location

The Chinese University of Hong Kong  
Hong Kong, China

### Organizers

Chair:

**Peter Koopman**

Vice Chair:

**Monika A. Ward**

Hong Kong Advisory Board:

**Tony F. Chan, Kathryn Song Eng Cheah, Fanny M.C. Cheung, Arthur B. Ellis, Barry Halliwell, Nancy Ip, Jian Lu, Peter Mathieson, Alfonso Ngan, Paul Tam, Benjamin Wah, Henry Wong, Vivian Wing-Wah Yam, Kenneth Young & Albert Cheung-Hoi Yu**

## Application Deadline

Applications for this meeting must be submitted by **May 21, 2017**. Please apply early, as some meetings become oversubscribed (full) before this deadline. If the meeting is oversubscribed, it will be stated here. *Note:* Applications for oversubscribed meetings will only be considered by the Conference Chair if more seats become available due to cancellations.

## Meeting Description

Germline cells play a unique and pivotal role as the carriers of genetic information from one generation to the next. Intense interest has centred on their origins, how their properties and behaviour are regulated genetically and epigenetically, and the molecular signals that drive meiosis and gamete formation. Insights into these processes are crucial for understanding and managing reproductive disorders including infertility, environmental endocrine disruption, and gonadal cancers. Especially topical are the issues of how germ cells come to be programmed initially, how their pluripotency is controlled, and how germline stem cells can be experimentally deprogrammed/reprogrammed, raising the prospect of generating functional gametes from induced pluripotent stem cells, and differentiated somatic cells from germline stem cells. Moreover, recent advances in germline genome editing have raised new possibilities for human disease treatment and agricultural biotechnology.

This conference will assemble leading scientists at the forefront of international research in a range of vertebrate systems. Participants have the opportunity to present their latest research through poster and platform presentations, and the informal setting of the Gordon Research Conference will provide ample opportunities for interaction and establishing new connections and collaborations. As a venue for presenting unpublished findings and for robust discussion, the conference will highlight emerging trends and define new research directions. The conference is located on the green and fragrant campus of the Chinese University of Hong Kong, welcoming participants to explore one of the world's most vibrant cities and a gateway to the heady delights of East Asia.

## Contributors

## Meeting Program

### Sunday

2:00 pm - 8:00 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	<b>Molecular Specification of Germline Cells</b> Discussion Leader: <b>Azim Surani</b> (University of Cambridge, United Kingdom)
7:40 pm - 7:45 pm	Introduction by Discussion Leader
7:45 pm - 8:10 pm	<b>Naoko Irie</b> (University of Cambridge, United Kingdom) "Uncovering the Molecular Network that Establishes the Human Germline"
8:10 pm - 8:20 pm	Discussion
8:20 pm - 8:45 pm	<b>Jenny Nichols</b> (Stem Cell Institute, University of Cambridge, United Kingdom) "Acquisition and Maintenance of Pluripotency in the Mammalian Embryo"
8:45 pm - 8:55 pm	Discussion
8:55 pm - 9:20 pm	<b>Kathy Niakan</b> (The Francis Crick Institute, United Kingdom) "Mechanisms of Lineage Specification in Human Embryos and Stem Cells"
9:20 pm - 9:30 pm	Discussion

### Monday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>Spermatogonial Stem Cells and Their Niche</b> Discussion Leader: <b>Jon Oatley</b> (Washington State University, USA)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:30 am	<b>Brian Hermann</b> (University of Texas at San Antonio, USA) "Conservation of a Spermatogonial Stem Cell Barcode in Mice and Humans"
9:30 am - 9:40 am	Discussion
9:40 am - 10:05 am	<b>Erika Matunis</b> (John Hopkins University School of Medicine, USA) "Regulation of Cell Identity in the <i>Drosophila</i> Spermatogonial Stem Cell Niche"
10:05 am - 10:15 am	Discussion
10:15 am - 10:45 am	Coffee Break
10:45 am - 11:10 am	<b>Shosei Yoshida</b> (National Institute for Basic Biology, Japan) "Dynamics of Spermatogenic Stem Cells in the Open Niche Environment"

11:10 am - 11:20 am	Discussion
11:20 am - 11:45 am	<b>Chris Geyer</b> (East Carolina University, USA) "Germ Cell Isthmuses in the Developing Testis"
11:45 am - 11:55 am	Discussion
11:55 am - 12:05 pm	Short Talk Selected from Poster Abstracts
12:05 pm - 12:10 pm	Discussion
12:10 pm - 12:20 pm	Short Talk Selected from Poster Abstracts
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	<b>Programming Fetal Germ Cells</b>
	Discussion Leader: <b>Peter Koopman</b> (The University of Queensland, Australia)
7:30 pm - 7:35 pm	Introduction by Discussion Leader
7:35 pm - 8:00 pm	<b>Josephine Bowles</b> (The University of Queensland, Australia) "Regulation of Fetal Germ Cell Development"
8:00 pm - 8:10 pm	Discussion
8:10 pm - 8:35 pm	<b>Yumiko Saga</b> (National Institute of Genetics, Japan) "Role of Nanos Proteins in Male Germ Cell Development"
8:35 pm - 8:45 pm	Discussion
8:45 pm - 9:10 pm	<b>Blanche Capel</b> (Duke University, USA) "Navigating the Germline Stem Cell to Pro-Spermatogonia Transition"
9:10 pm - 9:20 pm	Discussion
9:20 pm - 9:30 pm	General Discussion

## Tuesday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>Epigenetic Reprogramming of the Germline</b>
	Discussion Leader: <b>Amander Clark</b> (University of California, Los Angeles, USA)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:30 am	<b>Azim Surani</b> (University of Cambridge, United Kingdom) "Epigenetic Regulation of Potency and Competency for Cell Fate Decisions"
9:30 am - 9:40 am	Discussion
9:40 am - 10:05 am	<b>Weizhi Ji</b> (The Yunnan Key Laboratory of Primate Biomedical Research, China) "Methylation Analysis of Germline Cells in Rhesus Monkey"
10:05 am - 10:15 am	Discussion
10:15 am - 10:45 am	Coffee Break
10:45 am - 11:10 am	<b>Deborah Bourc'his</b> (Institut Curie, France) "Learning ABC in the Male Germline"

11:10 am - 11:20 am	Discussion
11:20 am - 11:45 am	<b>Wolf Reik</b> (The Babraham Institute, United Kingdom) "Single Cell Epigenomics"
11:45 am - 11:55 am	Discussion
11:55 am - 12:05 pm	Short Talk Selected from Poster Abstracts
12:05 pm - 12:10 pm	Discussion
12:10 pm - 12:20 pm	Short Talk Selected from Poster Abstracts
12:20 pm - 12:25 pm	Discussion
12:25 pm - 12:30 pm	General Discussion
12:30 pm	Lunch
2:00 pm - 4:00 pm	<u>Poster Session</u>
4:00 pm - 6:00 pm	<b><i>Ex-Vivo</i> Orchestration of Germline Development</b>
	Discussion Leader: <b>Mitinori Saitou</b> (Graduate School of Medicine, Kyoto University, Japan)
4:00 pm - 4:05 pm	Introduction by Discussion Leader
4:05 pm - 4:30 pm	<b>Yayoi Obata</b> (Tokyo University of Agriculture, Japan) "Maturing Embryonic Ovarian PGCs into Functional Oocytes in Culture"
4:30 pm - 4:40 pm	Discussion
4:40 pm - 5:05 pm	<b>Takehiko Ogawa</b> (Yokohama City University, Japan) "Production of Gametes in Testis Organ Culture"
5:05 pm - 5:15 pm	Discussion
5:15 pm - 5:40 pm	<b>Kazuhiro Kawamura</b> (St. Marianna University School of Medicine, Japan) "Infertility Treatment Through <i>In Vitro</i> Activation of Follicles"
5:40 pm - 5:50 pm	Discussion
5:50 pm - 6:00 pm	General Discussion
6:00 pm	Dinner

## Wednesday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>Making Gametes from Stem Cells <i>In Vitro</i></b>
	Discussion Leader: <b>Wai-Yee Chan</b> (Chinese University of Hong Kong, Hong Kong SAR China)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:30 am	<b>Mitinori Saitou</b> (Graduate School of Medicine, Kyoto University, Japan) " <i>In Vitro</i> Reconstitution of Germ Cell Development"
9:30 am - 9:40 am	Discussion
9:40 am - 10:05 am	<b>Xiaoyang Zhao</b> (Southern Medical University, China) "Mammalian Germ Cell Generation <i>In Vitro</i> "
10:05 am - 10:15 am	Discussion
10:15 am - 10:45 am	Coffee Break
10:45 am - 11:10 am	<b>Katsuhiko Hayashi</b> (Kyushu University, Japan) "Verification of Artificial Oocytes from Stem Cells"
11:10 am - 11:20 am	Discussion

11:20 am - 11:45 am	<b>Amander Clark</b> (University of California, Los Angeles, USA) "Enhancing Germline Differentiation from Human Pluripotent Stem Cells"
11:45 am - 11:55 am	Discussion
11:55 am - 12:05 pm	Short Talk Selected from Poster Abstracts
12:05 pm - 12:10 pm	Discussion
12:10 pm - 12:20 pm	Short Talk Selected from Poster Abstracts
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	<b>Medical and Biotechnological Applications of Germ Cell Research</b>
	Discussion Leader: <b>Chris Lau</b> (University of California, San Francisco, USA)
7:30 pm - 7:35 pm	Introduction by Discussion Leader
7:35 pm - 8:00 pm	<b>James Turner</b> (The Francis Crick Institute, United Kingdom) "Reprogramming-Mediated Chromosome Correction: Prospects for Application to Human Sex Chromosome Trisomies"
8:00 pm - 8:10 pm	Discussion
8:10 pm - 8:35 pm	<b>Jon Oatley</b> (Washington State University, USA) "Germline Ablation and Transplantation in Livestock"
8:35 pm - 8:45 pm	Discussion
8:45 pm - 9:10 pm	<b>Scott Fahrenkrug</b> (Recombinetics, Inc., USA) "Editing Germ Cell Lineages for Targeted Trait Addition and Horizontal Amplification"
9:10 pm - 9:20 pm	Discussion
9:20 pm - 9:30 pm	General Discussion

## Thursday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>Environmental Effects and Transgenerational Inheritance</b>
	Discussion Leader: <b>John McCarrey</b> (University of Texas at San Antonio, USA)
9:00 am - 9:05 am	Introduction by Discussion Leader
9:05 am - 9:30 am	<b>John Aitken</b> (University of Newcastle, Australia) "Transgenerational Inheritance: Paternal Impacts on the Mutational Load"
9:30 am - 9:40 am	Discussion
9:40 am - 10:05 am	<b>Anne Ferguson-Smith</b> (University of Cambridge, United Kingdom) "Non-Genetic Inheritance in a Mouse Model"
10:05 am - 10:15 am	Discussion

10:15 am - 10:45 am	Coffee Break
10:45 am - 11:10 am	<b>Sarah Kimmins</b> (McGill University, Canada) "Environmental Programming of the Heritable Sperm Epigenome"
11:10 am - 11:20 am	Discussion
11:20 am - 11:45 am	<b>Qi Chen</b> (University of Nevada, Reno School of Medicine, USA) "Sperm RNAs in Epigenetic Inheritance"
11:45 am - 11:55 am	Discussion
11:55 am - 12:05 pm	Short Talk Selected from Poster Abstracts
12:05 pm - 12:10 pm	Discussion
12:10 pm - 12:20 pm	Short Talk Selected from Poster Abstracts
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	<b>Genetic Influences on the Developing Germline</b> Discussion Leader: <b>Monika Ward</b> (University of Hawaii, USA)
4:00 pm - 4:05 pm	Introduction by Discussion Leader
4:05 pm - 4:30 pm	<b>Matthew Lorincz</b> (University of British Columbia, Canada) "Methylome, Transcriptome and Imprintome in Mouse Oocytes and Early Embryo"
4:30 pm - 4:40 pm	Discussion
4:40 pm - 5:05 pm	<b>John McCarrey</b> (University of Texas at San Antonio, USA) "Enhanced Genetic Integrity Is Central to Specification of Male Germline Stem Cells"
5:05 pm - 5:15 pm	Discussion
5:15 pm - 5:40 pm	<b>John Schimenti</b> (Cornell University, USA) "Genome Maintenance Mechanisms in Germ Cells"
5:40 pm - 5:50 pm	Discussion
5:50 pm - 6:00 pm	Closing Remarks
6:00 pm	Dinner

## Friday

7:30 am - 8:30 am	Breakfast
9:00 am	Departure