

Germline Development and Function

*Centre for Reproductive Health Inaugural
Reproduction Seminar Series, featuring virtual
seminars from leading reproductive biologists.*

SPEAKERS

Prof Mitinori Saitou, Kyoto University, Japan. *'Mechanisms and In Vitro Reconstitution of Mammalian Germ Cell Development'* **Tuesday, July 20, 2021, 9am**

Prof Gavin Kelsey, Babraham Institute, Cambridge, UK. *'Oocyte epigenomics and Modes of Intergenerational Epigenetic Inheritance'* . **Thursday, July 22, 2021, 5pm**

Prof Shosei Yoshida, National Institute for Basic Biology, Japan. *'Regulation of Spermatogonial Stem Cell Dynamics in the Testis'* **Wednesday, July 28 2021 9am**

A/Prof Sarah Kimmins, McGill University, Canada. *'Epigenetic Inheritance and Disease'* **Tuesday, August 3 2021, 9am**

A/Prof Anne Goriely, Oxford University, UK. *'Ageing men, their selfish testes, new mutations and congenital disease'* **Wednesday, August 11 2021 5pm**

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More information on following page.

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Summary of speakers

Professor Saitou has provided seminal advances in understanding germline specification and development in mammals such as mice, primates and humans. He has pioneered *in vitro* derivation of germline cells from embryonic stem cells and induced pluripotent stem cells, including the production of animals from the resulting germ cells. His work has significantly advanced understanding of the mouse and human germlines and raises interesting biological, clinical, agricultural, conservation and ethical questions surrounding *in vitro* production of germ cells and offspring.

Professor Kelsey has substantially advanced understanding of the mechanisms underpinning epigenetic programming in the female germline, particularly DNA methylation and histone modifications in growing oocytes. His work is providing important insight into how epigenetic states are established in mammalian germ cells and early embryos, and the effects of ageing and diet on the integrity of epigenetic information and its transmission to offspring, in which it can affect health and development.

Professor Yoshida has generated landmark discoveries on the biology of spermatogonial stem cells (SSCs) and pioneered intravital imaging approaches in the study of SSC topology and motion within seminiferous tubules. By combining lineage tracing studies with mathematical modelling, he has provided critical insight into fate dynamics of SSCs and documented the ability of progenitor populations to dedifferentiate to the SSC state to assist with germline regeneration. His studies have recently uncovered novel mechanisms that control SSC density within the testis.

A/Professor Kimmins research is focused on male fertility and how a father's environment (diet, BMI & toxicants) impacts sperm and offspring health and development. She has made important contributions to understanding the sperm epigenome at the levels of DNA methylation and post-translational histone modifications. Her work is focused on how environmental exposures in the father alter the sperm epigenome, how this molecular information is transmitted to the embryo and its impacts on offspring health and development.

A/Professor Goriely has focused on understanding genetic mutations in the male germline, particularly the concept of "Selfish Spermatogonial Selection" whereby mutations in key determinants of spermatogonial stem cell self renewal, driving their clonal expansion. These mutations result in production of distinct populations of sperm that transmit specific mutations to offspring and underlie age-related increases in specific pathologies. A/Prof Goriely's work aims to understand how selfish selection affects genome heterogeneity and how mutation rates are controlled in the male germline to ensure the faithful transmission of genetic material across generations.