

OVERVIEW

The Reproductive Science Group focuses on the cellular and molecular mechanisms that drive the reproductive process in man and animals. The information generated in this research will be used to fuel new developments in the key areas of fertility control, infertility and reproductive oncology.

At the present time infertility is so widespread that one in every 35 children is produced by assisted conception. While this treatment is certainly effective it comes at a cost, since the birth defect rate for these children is double that observed in the general population.

Aside from infertility, the world has also seen recent increases in other forms of reproductive pathology, including testicular cancer and sexually transmitted disease. Moreover, no radically new forms of contraception have become available since the introduction of the 'pill' in 1960.

Improvement in all of the above areas depends upon a knowledge of how the reproductive system works. The Reproductive Science Group is dedicated to the acquisition of this knowledge.

OBJECTIVES

The objectives of our research program include:

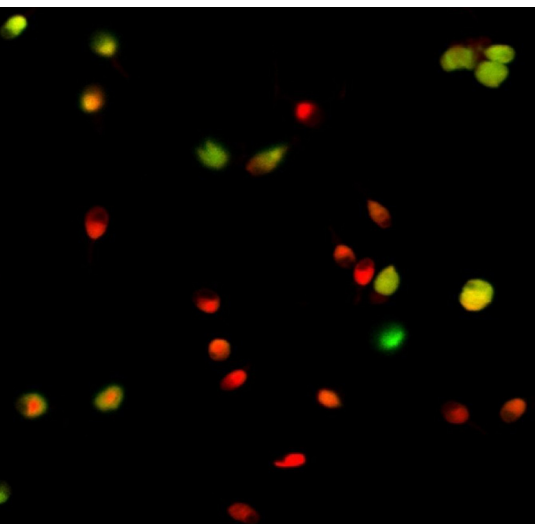
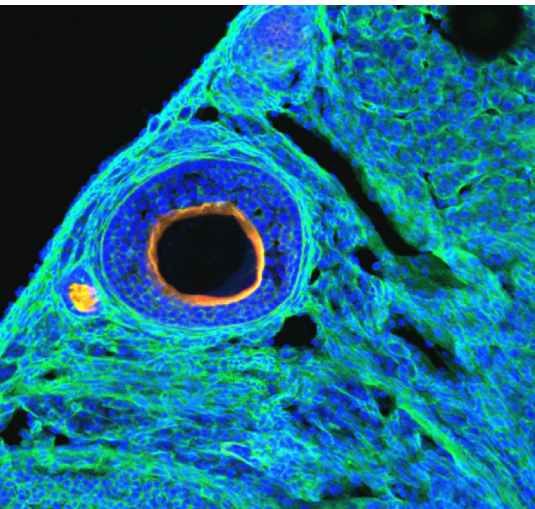
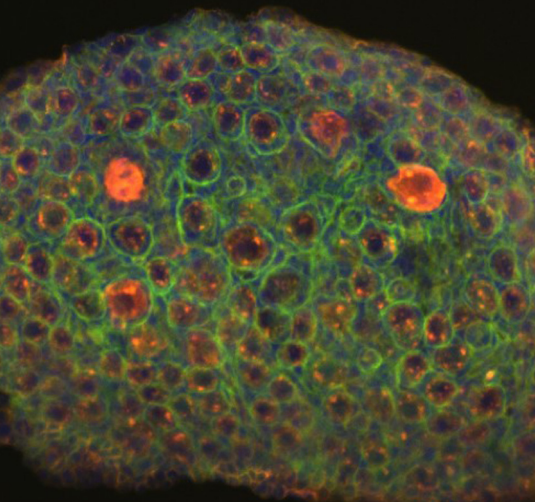
- To understand the fundamental mechanisms responsible for the differentiation of mammalian spermatozoa and oocytes
- To resolve the developmental origins of birth defects
- To determine the causes of male infertility and testicular cancer
- To resolve the impact of age on gamete quality in men and women
- To optimise the safety and efficacy of assisted conception procedures
- To develop novel forms of contraception particularly reversible male methods and dual purpose spermicide-microbicides
- To develop novel, non-surgical approaches to the sterilization of domestic and feral animals

EXTERNAL COLLABORATORS

- CSIRO, NuSep, Bayer-Schering-Pharma, Pestat, Hunter IVF, Sydney IVF, IVF Australia
- National academic collaborations with the University of Queensland, Queensland University of Technology, University of Melbourne, Monash University, Prince Henry's Research Institute, University of Canberra, and the University of Adelaide
- International academic collaborations with University of California, Queen's University, University of Ottawa; Emory University and Cornell University

RESEARCH SUPPORT

Our research is funded by ARC, NHMRC, HMRI, Invasive Animal CRC, CSIRO, Found Animals Foundation, NuSep, Bill and Melinda Gates Foundation and the NSW Government.



EXAMPLES OF CURRENT PROJECTS

- Develop a non-surgical method of sterilization
- Analysis of factors causing DNA damage in the germ line
- Analysis of the molecular basis of primordial follicle activation
- Analysis of the molecular mechanisms regulating sperm function

RESEARCH TOPICS

- Molecular basis of sperm-egg interaction in the mouse
- Molecular basis of sperm-zona pellucida interaction in the human
- Molecular basis of epididymal maturation
- Redox activity in the male germ line
- DNA damage and assisted conception
- DNA methylation in the male germ line
- DNA damage and chromatin structure
- Micro RNAs and testicular tumours
- Cytokine signalling and primordial follicle activation

RESEARCH OUTCOMES

- 2011 17th Annual NSW Cell and Developmental Biology Meeting - 2nd place for Best Oral Presentation awarded to Matthew Dun
- 2010 Ooza Award to Alexander Sobinoff
- 2010 OzBio Poster prize to Kate Redgrove
- 2009 Vice-Chancellor's Faculty Research Excellence Award to Dr Mark Baker
- 2009 Vice-Chancellor's Faculty Supervision Award to Dr Brett Nixon
- 2009 Faculty Research Excellence Award to Matthew Dun
- 2008 Merck Sorono A.R.T. Young Investigator Award to Yun Hwa Lee
- 2008 Ooza Student Award to Matthew Dun
- 2008 ISS2010 Best poster/paper Award to Matthew Dun, John Aitkin and Brett Nixon

GROUP MEMBERS

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