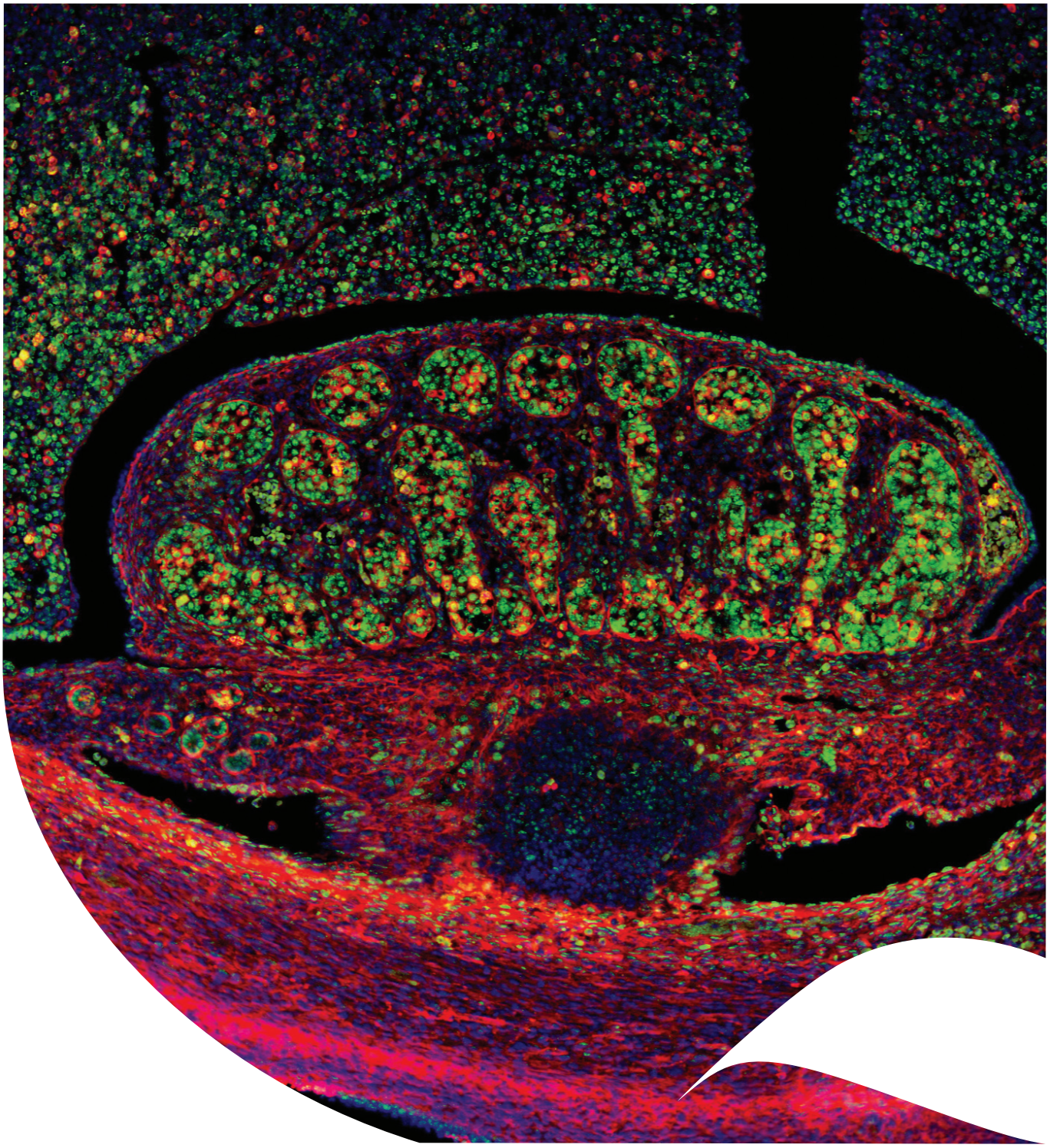
THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

CREATE CHANGE

Biomedical Sciences

Reproductive Developmental Biology



Germ cells, the precursors to sperm and eggs, provide the key to sexual reproduction and continuation of the species. Germ cells are unique in that they are the only cell type in the body capable of undergoing meiosis, a special reductive cell division. In the Bowles Lab we investigate the role of molecular signaling pathways that control the critical processes of meiosis and germline pluripotency during both normal development (in mice) and in disease (in humans). **(A)**

Services

- Design and production (with TASQ) of transgenic mouse lines (using CRISPR/Cas9 technology as well as conventional pronuclear injection)
- RNAseq
- in situ hybridisation
- immunohistochemistry
- immunofluorescence and confocal imaging
- embryonic tissue dissection
- germ cell isolation by MACS/FACS
- Primary cell culture
- Organ culture
- qRT-PCR
- Testis histology (incl. TEM)
- Ovarian histology

Transgenic mouse models (B):

- X-linked-eGFP – sex embryos based on florescence
- Oct4-GFP – isolate/identify germ cells based on fluorescence (birth -> adulthood)
- W^e – germ cell depleted mutant
- RARE-LacZ – for colourimetric readout of retinoic acid (RA) signalling
- Stra8-eGFP – fluorescence report of endogenous Stra8 expression (meiotic entry)
- Rosa-Td-Tomato - fluorescence report of Cre recombinase expression
- Rosa-lacZ – Bgal report of Cre recombinase expression

Cre lines:

- Oct4-CreERT2 (tamoxifen inducible Cre expression in Oct4 expressing cells)
- Sf1-Cre (Sf1 aka NR5A1)
- Vasa-Cre (germline from approx. 15.5 dpc)

Overexpressing lines:

- Cripto (Nodal receptor, aka TDGF1)– conditional overexpression, timing/location based on choice of Cre Recombinase line
- Otx2

Contact

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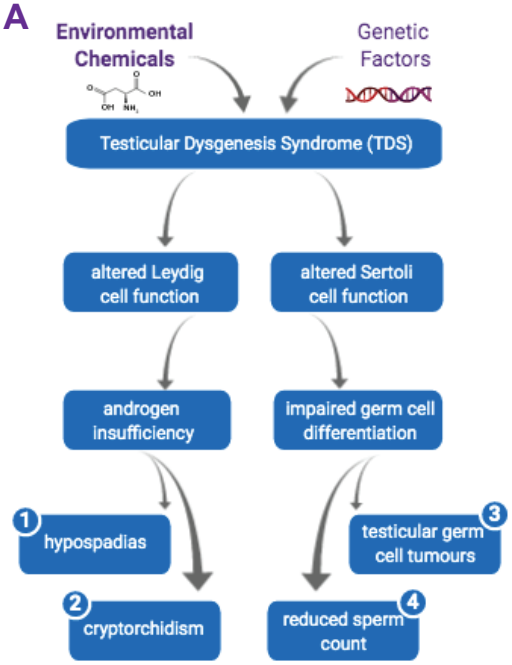
A



KO lines:

- FGF9, Cyp26b1, Aldh1a1 (cancer stem cell marker), Bax1, Sox30, Stra8

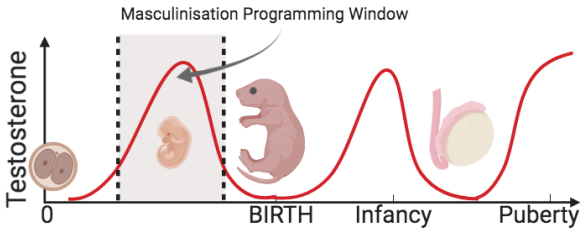
cKO lines

- Sox9, FGFR2, Nodal, Otx2, Lhx1, Cripto (TDGF1), Cyp26b1, Tmem2

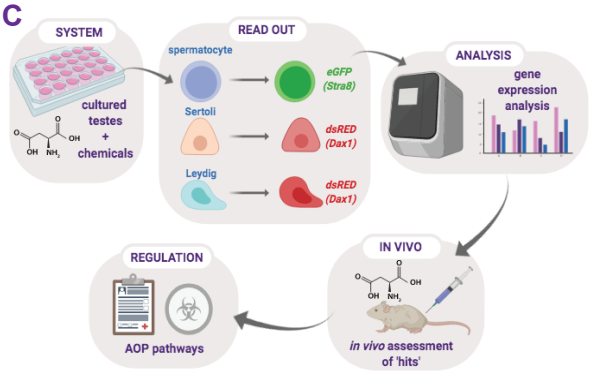
Equipment (C)

Organ culture systems: we are currently gearing up for a pipeline of read-out for chemical perturbation to normal testicular development.

B



C



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