

Developmental Biology Research

School of Biomedical Sciences
Monash University, Clayton campus
www.med.monash.edu.au/anatomy

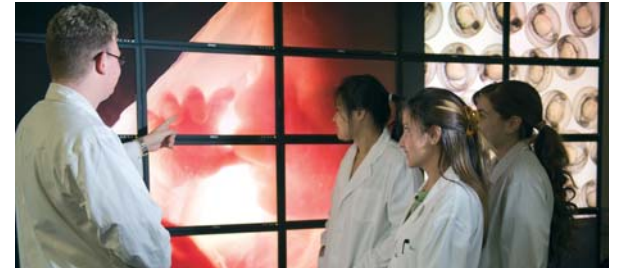
Developmental Biology is one of ten research strengths of the Faculty of Medicine, Nursing and Health Sciences.

Honours

We provide research training to students enrolled in the BSc(Hons) and BBioMedSc(Hons) degrees. Students undertake a research project under the and at the end of the year write a thesis.

Masters and PhD

Students who perform well in the BSc(Hons) and BBioMedSc(Hons) year are eligible to enrol in a higher research degree (MBAimedSci or PhD). These typically take two years full-time for the Masters course and three years full-time for a PhD.

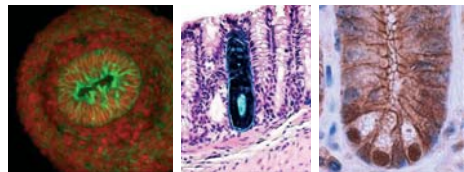


Dr Helen Abud

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Epithelial regeneration

- How growth and differentiation is controlled in the developing intestine.
- Molecular mechanisms regulating intestinal stem cells.
- How potential cancer-causing genes initiate tumour formation in the intestine.

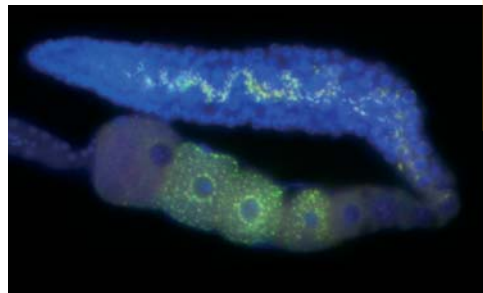


Dr Peter Boag

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Development and RNA biology

- Primarily interested in understanding how post-transcriptional gene regulation influences development and cellular function.
- We use the free-living, non-parasitic round worm *C. elegans* as our model system.
- Projects aim to elucidate the mechanisms governing the formation and function of germline mRNA storage granules and their requirement for fertility and embryonic viability.
- Another area of interest is understanding the function of a family of atypical protein kinases during development.

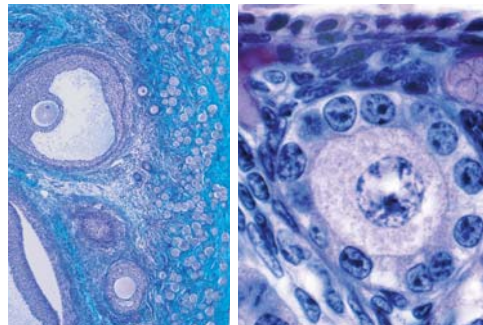


Associate Professor Jeff Kerr

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Gene regulation of ovarian follicle development: impacts on fertility

- Genes controlling oocyte supply during fetal/postnatal development.
- Strategies that delay the menopause: can follicle life be extended?
- Rescue of fertility after chemo or radiotherapy.
- Cellular and molecular biology of declining oocyte quality with age.



Dr James Armitage

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Fetal development and disease laboratory

- How does maternal diet affect the development of the fetus and what are the consequences for later life?
- How do maternal high fat diets 'programme' hypertension and metabolic disease?
- How does maternal protein and folic acid intake affect kidney development?
- How does the brain and autonomic nervous system contribute to obesity and hypertension?

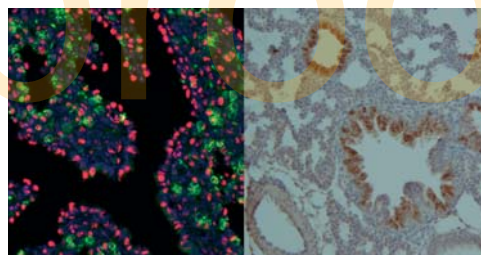


Associate Professor Tim Cole

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Endocrine control of fetal development

- Novel steroid treatments for very preterm babies.
- Mouse models to dissect endocrine signaling pathways during lung development.
- Respiratory stem cells and lung repair.
- Immune and metabolic actions of corticosteroids.



Associate Professor Kate Loveland

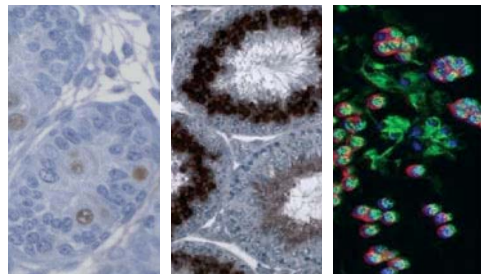
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Developmental switches in testis growth and spermatogenesis

Adult fertility is determined by a progressive series of developmental switches that begin in the fetus and continue throughout life. We study how these occur normally, and define what changes are linked with infertility, testicular cancer and events in other developmental systems.

Our core projects address:

- Activin and TGFβ superfamily ligand signaling interactions and its regulation, using mouse models, human clinical specimens and cell lines.
- Developmentally regulated nucleocytoplasmic transport, through functional characterisation of key intracellular transport machinery and their cargo.

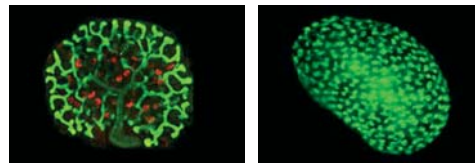


Professor John Bertram

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Kidney development and regeneration

- Discovering the roles of genes in kidney and ureter development.
- Effects of prenatal alcohol exposure on kidney development.
- Rescuing nephron number.
- Stem cell repair of adult kidney disease.
- Consequences of suboptimal kidney development for adult kidney and cardiovascular health.
- Nephron number and size in Australian, US and African kidneys.

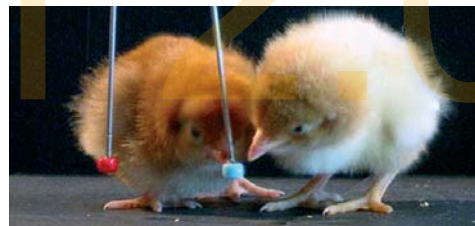


Dr Marie Gibbs

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Developmental neuropharmacology

- Effect of prenatal compromise during foetal development on learning and memory after hatch in chicks.
- Effect of beta-amyloid on memory processing in Down syndrome and Alzheimer's disease.
- Role of astrocytes in development and memory.

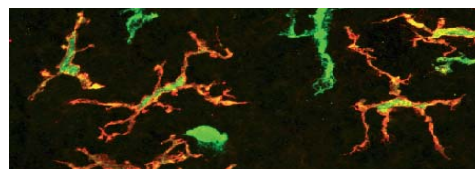


Professor Paul McMenamin

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Eye development and function

- Animal models of human eye disease (corneal infection, uveitis and age-related macular degeneration).
- The effect of diet and the environment on sight.
- The function of immune cells in eye tissues including the use of intravital microscopy to visualise membrane nanotubes on corneal dendritic cells.

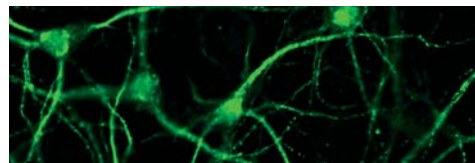


Dr Melanie Pritchard

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Down syndrome/Alzheimer's disease

- Functional characterisation of genes involved in the neuropathology of Down syndrome and Alzheimer's disease.
- Mouse models of Down syndrome.
- Knockout and transgenic mice to interrogate gene function.

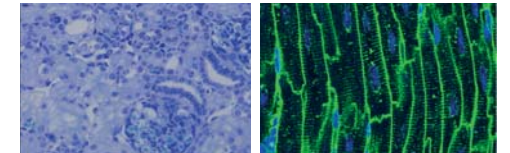


Associate Professor M Jane Black

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Cardiovascular and renal cell biology

- Effects of perturbations in early development on the structure of the heart and kidney at birth and later in life.
- The effect of preterm birth on the kidney and heart.

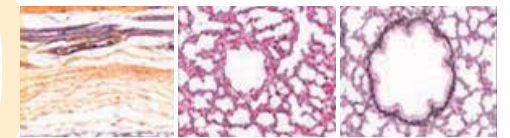


Professor Richard Harding

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Respiratory development and programming

- Mechanisms controlling lung development: effects of preterm birth and gender.
- Effects of preterm birth on critical organ development.
- Protecting the fetal and newborn brain from injury.
- Influence of *in utero* alcohol exposure on fetal development.

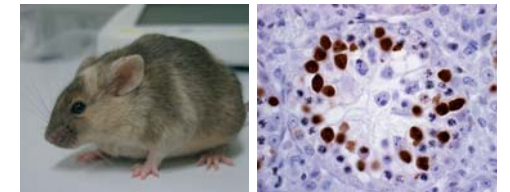


Associate Professor Moira O'Bryan

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Male infertility and germ cell biology laboratory

- Male germ cell development and function.
- Animal models of human disease.
- Causes of human male infertility.
- Ion channel regulation.
- DNA repair mechanisms.



Dr Ian Smyth

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Cutaneous developmental biology

- We study developmental diseases affecting the skin and hair.
- Our core research is based on an adhesion protein family required for normal epidermal development.
- Mutations in these proteins give rise to Fraser Syndrome which leads to skin and kidney defects.
- We are interested in understanding how the skin differentiates during embryonic development, how stem cell activity is regulated in this tissue and in identifying new models for skin disease.

