

MSc(BioSci)/Hons Research Projects - School of BioSciences - 2020

This file lists supervisors offering projects for the **Master of Science (BioSciences)** and **Bachelor of Science (Honours)** in BioSciences, grouped into one or more Research Themes. For more information go to <https://biosciences.unimelb.edu.au/study/supervisor-project-directory>.

Biomedical Science and Human Biology

Many scientists in the school study humans and human health: how the body develops, how it is affected by mutations, pathogens and the environment, and how it has evolved.

Particular areas of focus are the study of how life begins and carries on to the next generation, and how basic mechanisms of reproduction and development are disrupted by harmful chemicals and pollution in our environment as well as by genetic disorders. We study fundamental genetic mechanisms underlying development, homeostasis, disease, and physiology using powerful biomedical organisms such as fruit flies, zebrafish, marsupials, mouse, and humans themselves. We study how the body is assailed by pathogenic agents such as fungi and mosquito-borne pathogens that cause malaria and dengue fever and explore new strategies to combat these. Finally, we address our place on earth as a species, how our genomes have evolved and how our existing populations are structured.

Supervisors

Prof. Alex Andrianopoulos	Microbial and developmental genetics
Dr Paolin Rocio Cáceres Vélez	Therapies and genetics underlying neuronal cell health
Dr Mary Familiari	Developmental biology
Dr Jane Fenelon	Reproductive and developmental biology
Dr Stephen Frankenberg	Mammalian early development and stem cells
Dr Irene Gallego Romero	Human evolution and functional genomics
Prof. David Gardner	Reproductive biology
Dr Christopher Dean Goodman	Malaria biology and host-vector interactions
Dr Mark Green	Reproductive biology
Dr Xinyue Gu	Molecular entomology, endosymbionts, environmental stress
Dr Alexandra Harvey	Embryonic stem cells
Prof. Ary Hoffmann	Pest and environmental adaptation
Dr Patricia Jusuf	Neural development and regeneration, and disease modelling and treatment screening

Prof. Stephen Leslie	Statistical Genetics/Genomics
Prof. Geoffrey McFadden	Malaria and endosymbiosis
Dr Michael Murray	Developmental genetics of Drosophila
Prof. Andrew Pask	Evolution, development and reproduction
Prof. Marilyn Renfree	Reproductive and developmental biology
Dr Gerard Tarulli	Reproductive and developmental biology

Biotechnology and Translational Research

The supervisors below have projects available in the area of biotechnology and translational research.

Supervisors

Dr Simon Baxter	Applied pest control; pest biology
Dr Paolin Rocio Cáceres Vélez	Therapies and genetics underlying neuronal cell health
Dr John Golz	Developmental regulation and translational research
Dr Mark Green	Reproductive biology
Dr Mike Haydon	Plant cell signalling
A/Prof. Alex Johnson	Plant and food biotechnology
Dr Patricia Jusuf	Neural development and regeneration, and disease modelling and treatment screening
Dr Trent Perry	Insecticide biology, neurogenetics, parasitic biology of the blowfly
Prof. Ute Roessner	Abiotic stress adaptation and tolerance

Conservation and Climate Change

The Conservation and Climate Change Group applies ecological and evolutionary principles to the field of wildlife, conservation and applied biology across a wide range of land animals (including mammals, birds, reptiles, amphibians, a wide range of invertebrates, and some plant groups). Particular interests include the management of native and invasive species; habitat use and ecology of mammals and reptiles; first-principles modelling of individual, population, and evolutionary dynamics; application of genomic techniques to biodiversity management; and terrestrial animals as bioindicators of environmental disturbance.

Supervisors

Dr Natalie Briscoe	Ecology and global change biology
Dr Melissa Carew	Freshwater biological monitoring
A/Prof. Rob Day	Marine ecology, aquaculture, fisheries, climate change effects on marine animals
Dr Alex Fournier-Level	Adaptive evolution
Prof. Ary Hoffmann	Pest and environmental adaptation
Prof. Michael Kearney	Physiological ecology, climate change responses, metabolic ecology, insect conservation, grasshopper biology
Dr John Morrongiello	Marine and freshwater ecology
Dr Kevin Rowe	Integrative mammalogy: taxonomy, evolution, genomics, morphology, conservation biology
Dr Joshua Thia	Population genomics, evolutionary biology, and applied science
Dr Belinda van Heerwaarden	Climate change adaptation
A/Prof. Peter Vesk	Ecology, conservation and management; plants and vegetation
Dr Matt West	Applied ecology and wildlife conservation
Professor Brendan Wintle	Conservation and ecology

Developmental and Cellular Genetics

The living cell possesses extraordinary capabilities that allow it to sense and respond to its environment, metabolise nutrients required for growth and division and undergo changes in cell shape and function. All of these processes are under the control of the hereditary instructions or genes it expresses, from among the thousands in its genome.

Supervisors

Prof. Alex Andrianopoulos	Microbial and developmental genetics
Prof. Phil Batterham	Neurogenetics, behaviour and systems biology in insects
Dr Paolin Rocio Cáceres Vélez	Therapies and genetics underlying neuronal cell health
Dr Michael Duffy	Malaria pathogenesis and nuclear biology
Dr John Golz	Developmental regulation and translational research
Dr Christopher Dean Goodman	Malaria biology and host-vector interactions
Dr Mike Haydon	Plant cell signalling
Dr Patricia Jusuf	Neural development and regeneration, and disease modelling and treatment screening

[Prof. Geoffrey McFadden](#)

Malaria and endosymbiosis

[Dr Michael Murray](#)

Developmental genetics of Drosophila

[Dr Trent Perry](#)

Insecticide biology, neurogenetics, parasitic biology of the blowfly

[Prof. Marilyn Renfree](#)

Reproductive and developmental biology

[Dr Heroen Verbruggen](#)

Marine genomics and microbiology

Evolution and Behaviour

The Evolution and Behaviour Group examines the behaviour and evolution of land animals at several levels, from genes to populations. Research on behaviour includes: visual signalling in birds, reptiles and insects; acoustic signalling in birds and amphibians; and chemical signalling in insects. Research in evolutionary biology investigates the evolutionary process that produced the diversity of life we see today. This includes the study of macro-evolutionary patterns of phenotypic diversity, phylogeny and taxonomy; biogeography and patterns of speciation; the origin, structure and maintenance of hybrid zones; sexual selection, including female choice and sperm competition; the evolution of co-operation in birds and invertebrates; and inter-specific relationships.

Supervisors

Prof. Mark Elgar	Evolutionary ecology
Dr Xinyue Gu	Molecular entomology, endosymbionts, environmental stress
Dr Luke Holman	Evolutionary ecology
Dr Therésa Jones	Behavioural ecology, Urban Light Pollution and Evolutionary Ecology
Prof. Michael Kearney	Physiological ecology, climate change responses, metabolic ecology, insect conservation, grasshopper biology
Dr Kathryn McNamara	Evolutionary ecology
Dr Iliana Medina Guzman	Evolutionary ecology
Prof. Raoul Mulder	Behavioural ecology
Dr Karen Rowe	Ecology and conservation using museum collections and acoustics
Dr Perran Stott-Ross	Environmental stress, evolution, entomology and endosymbionts
Prof. Devi Stuart-Fox	Evolutionary ecology
Dr Joshua Thia	Population genomics, evolutionary biology, and applied science
A/Prof. Paul Umina	Insect ecology and management

Marine Biology

Marine biologists in the School of BioSciences work on a diversity of topics across marine organisms, their conservation and management. We conduct our research in temperate and tropical marine environments, from estuaries to the deep sea.

Together we investigate the:

- Behaviour, ecology, evolution and biodiversity of marine organisms;
- Effects of human disturbance on habitats, species and communities;
- Technologies to improve the productivity of aquaculture and its environmental performance;
- Adaptation of aquaculture and fishery management for climate change;
- Ecological aspects of marine protected areas and fisheries management.

Supervisors

Dr Luke Barrett	Marine ecology and sustainable aquaculture
A/Prof. Anthony Boxshall	Marine ecology, coastal climate adaptation, pollution impact and management, and environmental sciences
A/Prof. Rob Day	Marine ecology, aquaculture, fisheries, climate change effects on marine animals
A/Prof. Tim Dempster	Marine ecology and aquaculture
Prof. Greg Jenkins	Marine ecology
Prof. Mick Keough	Marine ecology
Prof. Geoffrey McFadden	Malaria and endosymbiosis
Dr Rebecca Morris	Marine ecology and coastal climate adaptation
Dr John Morronegiello	Marine and freshwater ecology
Dr Allyson O'Brien	Marine pollution, ecology, and environmental management
Dr Nick Robinson	Aquaculture breeding and genetics
Prof. Steve Swearer	Marine ecology, evolution, and environmental management
Prof. Madeleine Van Oppen	Marine ecology and evolution
Dr Heroen Verbruggen	Marine genomics and microbiology
Dr Fletcher Warren-Myers	Marine ecology and aquaculture

Melbourne Integrative Genomics

The groups based within Melbourne Integrate Genomics all apply various computational and experimental approaches to understand how genes shape living organisms, at large scale. Research includes the development of robust gene regulatory models with applications in synthetic biology, studies of human evolution at both the genetic and the experimental level, and tackling computational

and statistical problems in population genetics, including helping to understand the complex HLA and KIR gene systems and the genomic basis of complex human traits.

Supervisors

[Prof. David Balding](#)

Statistical genomics

[Dr Irene Gallego Romero](#)

Human evolution and functional genomics

[Prof. Stephen Leslie](#)

Statistical Genetics/Genomics

[Dr Michael Stumpf](#)

Theoretical systems biology

Microbiology

Microbes are both vital and problematic. Without them our world couldn't exist, but some cause us monumental grief. Understanding microbes helps us manage our environment, stay healthy and look after our crops, livestock and food supplies. Genetic tools have given us powerful means to understand these invisible organisms that impact our lives in myriad ways.

Supervisors

Prof. Alex Andrianopoulos	Microbial and developmental genetics
Dr Christopher Dean Goodman	Malaria biology and host-vector interactions
Dr Alexander Idnurm	Fungal biology
Prof. Geoffrey McFadden	Malaria and endosymbiosis
Dr Kathryn McNamara	Evolutionary ecology
Prof. Madeleine Van Oppen	Marine ecology and evolution
Dr Heroen Verbruggen	Marine genomics and microbiology
Dr Robert Walker	Plant, soil and microbe interactions
Prof. Michelle Watt	Plant root system discovery and application to human and environmental challenges

Mycology and Plant Pathology

The fungi are a large group of over a million estimated microscopic and macroscopic species. They play fundamental roles in ecology, industry, and plant and animal diseases. The mycology and plant pathology focuses in the School are on both crop and human diseases, as well as investigation of fungal diversity. We apply molecular and field-based approaches to identify genes essential for disease, molecular mechanisms involved in virulence, genes and mechanisms involved in fungicide resistance and management strategies to minimise the deleterious impact of fungal diseases.

Supervisors

Dr Alexander Idnurm	Fungal biology
Dr Angela Van de Wouw	Plant pathogen interactions

Plant Biology

Life is dependent on plants: as the only organisms able to make their own food, these primary producers are vital to the world's ecosystems. From food, medicines, clothing and the air we breathe, we could not exist without them. Indeed, all of the research that occurs within the School of BioSciences is built upon the foundation of plant functions. Research groups in Plant Biology study a broad range of topics including:

- Plant diversity, classification, biogeography and conservation
- Plant growth and development
- Plant cell wall biosynthesis and cell-cell communication
- Plant nutrition and genetic engineering of crops to improve human nutrition (biofortification)
- Plant breeding systems and self incompatibility
- Plant defence against herbivory; plant secondary metabolites including cyanogenic compounds and the oils of eucalypts
- Plant interactions with fungal pathogens
- Evolution of plant, algal and protozoan cells, e.g., evolution of endosymbionts, the malaria parasite with its remnant chloroplast, and biomineralisation and bioadhesion of algal cell walls.

Students working in the plant biology field are eligible for support in the form of the generous scholarships and awards from the [Botany Foundation](#).

Supervisors

Dr Joanne Birch	Plant Evolution
A/Prof. Andrew Drinnan	Plant development, morphology, anatomy, architecture and evolution
Dr Berit Ebert	Plant cell wall biosynthesis
Dr John Golz	Developmental regulation and translational research
Dr Jason Goodger	Plant natural products
Dr Mike Haydon	Plant cell signalling
Prof. Joshua Heazlewood	Plant glycomics
A/Prof. Alex Johnson	Plant and food biotechnology
Dr Edwin Lampugnani	Plant evolution and development
A/Prof. Ed Newbigin	Pollen biology
A/Prof Suzie Reichman	Pollution impact and management
Prof. Ute Roessner	Abiotic stress adaptation and tolerance
Dr Marc Somssich	Plant-Fungal interactions and plant cell walls
Dr Allison Van de Meene	Plant cell biology using high-end microscopy techniques
A/Prof. Peter Vesk	Ecology, conservation and management; plants and vegetation

[Dr Robert Walker](#)

Plant, soil and microbe interactions

[Prof. Michelle Watt](#)

Plant root system discovery and application to human and environmental challenges

Pollution Impact and Management

Researchers in the Centre for Anthropogenic Pollution Impact and Management investigate the fate, behaviour, toxicity and management of pollution in the environment including in water, soil, air, light and waste. Our research covers human health and ecological sustainability including traditional pollutants (e.g. metals, nitrogen and hydrocarbons) as well as emerging contaminants such as per- and poly-fluoroalkyl substances (PFAS) and microplastics. Outcomes from our research are used by government, industry and the community to make decisions and more safely manage polluted environments.

Supervisors

[A/Prof. Anthony Boxshall](#)

Marine ecology, coastal climate adaptation, pollution impact and management, and environmental sciences

[Prof. Mark Elgar](#)

Evolutionary ecology

[Dr Mark Green](#)

Reproductive biology

[Dr Therésa Jones](#)

Behavioural ecology, Urban Light Pollution and Evolutionary Ecology

[Dr Allyson O'Brien](#)

Marine pollution, ecology, and environmental management

[A/Prof Suzie Reichman](#)

Pollution impact and management

[Prof. Ute Roessner](#)

Abiotic stress adaptation and tolerance

[Prof. Steve Swearer](#)

Marine ecology, evolution, and environmental management

Population and Quantitative Genetics

The Population and Quantitative Genetics Group investigate the causes and consequences of genetic variation in natural populations. A broad range of statistical techniques such as Genome-Wide Association and Genomic Selection methods are used to explore the pattern and effect of molecular variation at the whole genome level. Biological models of interest include humans, plants and insects with an emphasis on biological questions related to human health and agriculture.

Supervisors

Dr Simon Baxter	Applied pest control; pest biology
Dr Charles Robin	Insect population genetics and molecular evolution
Dr Kevin Rowe	Integrative mammalogy: taxonomy, evolution, genomics, morphology, conservation biology
Dr Perran Stott-Ross	Environmental stress, evolution, entomology and endosymbionts
Dr Joshua Thia	Population genomics, evolutionary biology, and applied science
Dr Belinda van Heerwaarden	Climate change adaptation
Dr Andrew Weeks	Conservation biology
Dr Qiong Yang	Insect pest and endosymbionts

Quantitative and Applied Ecology

The Quantitative and Applied Ecology Group work across a wide spectrum of organisms and environments. Our research focus includes; environmental decision making, ecosystem management, conservation biology, and community and population ecology. The group also forms part of larger research centres: The ARC Centre of Excellence for Environmental Decisions (CEED) and the Threatened Species Recovery (TSR) hub of the National Environmental Science Program (NESP).

Supervisors

Dr Natalie Briscoe	Ecology and global change biology
Dr David Duncan	integrity of native ecosystems in human dominated landscapes
Dr Gurutzeta Guillera-Arroita	Quantitative ecology
Prof. Michael Kearney	Physiological ecology, climate change responses, metabolic ecology, insect conservation, grasshopper biology
Dr Jose Lahoz-Monfort	Ecological modelling
Dr James Maino	Insect spatial ecology
Prof. Michael McCarthy	Ecology
Dr Darren Southwell	Adaptive management and optimal monitoring of threatened species
Dr Joshua Thia	Population genomics, evolutionary biology, and applied science
A/Prof. Paul Umina	Insect ecology and management
A/Prof. Peter Vesk	Ecology, conservation and management; plants and vegetation
Dr Matt West	Applied ecology and wildlife conservation
Dr Bonnie Wintle	Conservation ecology / CEED
Professor Brendan Wintle	Conservation and ecology

Reproduction and Development

The Reproduction and Development Groups study the very beginnings of life and factors that influence the growth and health of the embryo, foetus and offspring. Basic and biomedical research of mammalian systems focuses on the genetics and molecular control of early embryo development, sexual

differentiation, environmental disruptors of development, stem cell biology, comparative genomics and reproductive physiology. Reproduction is the science of the transmission of life!

Supervisors

[Dr Mary Familiari](#)

Developmental biology

[Dr Jane Fenelon](#)

Reproductive and developmental biology

[Dr Stephen Frankenberg](#)

Mammalian early development and stem cells

[Prof. David Gardner](#)

Reproductive biology

[Dr Mark Green](#)

Reproductive biology

[Dr Alexandra Harvey](#)

Embryonic stem cells

[Prof. Andrew Pask](#)

Evolution, development and reproduction

[Prof. Marilyn Renfree](#)

Reproductive and developmental biology

[Dr Gerard Tarulli](#)

Reproductive and developmental biology

Ecology and Evolutionary Biology

Research groups in the Ecology and Evolutionary Biology Domain address both fundamental and applied questions spanning the breadth of the two disciplines. Our research includes quantitative risk assessment, ecological and species distribution modelling, vegetation mapping, integrative pest and disease management, conservation biology, marine and fisheries management, and behavioural ecology. We ask questions at different levels of organization from individuals through to assemblages and study a broad array of organisms that span aquatic and terrestrial ecosystems.

Supervisors

Dr Luke Barrett	Marine ecology and sustainable aquaculture
Dr Joanne Birch	Plant Evolution
A/Prof. Anthony Boxshall	Marine ecology, coastal climate adaptation, pollution impact and management, and environmental sciences
Dr Natalie Briscoe	Ecology and global change biology
Dr Melissa Carew	Freshwater biological monitoring
A/Prof. Rob Day	Marine ecology, aquaculture, fisheries, climate change effects on marine animals
A/Prof. Tim Dempster	Marine ecology and aquaculture
A/Prof. Andrew Drinnan	Plant development, morphology, anatomy, architecture and evolution
Dr David Duncan	integrity of native ecosystems in human dominated landscapes
Prof. Mark Elgar	Evolutionary ecology
Dr Nancy Endersby-Harshman	Insecticide resistance, ecology and population genetics
Dr Xinyue Gu	Molecular entomology, endosymbionts, environmental stress
Dr Gurutzeta Guillera-Arroita	Quantitative ecology
Prof. Ary Hoffmann	Pest and environmental adaptation
Dr Luke Holman	Evolutionary ecology
Prof. Greg Jenkins	Marine ecology
Dr Therésa Jones	Behavioural ecology, Urban Light Pollution and Evolutionary Ecology
Prof. Michael Kearney	Physiological ecology, climate change responses, metabolic ecology, insect conservation, grasshopper biology
Prof. Mick Keough	Marine ecology
Dr Jose Lahoz-Monfort	Ecological modelling
Dr James Maino	Insect spatial ecology

Prof. Michael McCarthy	Ecology
Dr Kathryn McNamara	Evolutionary ecology
Dr Iliana Medina Guzman	Evolutionary ecology
Dr Rebecca Morris	Marine ecology and coastal climate adaptation
Dr John Morrongiello	Marine and freshwater ecology
Prof. Raoul Mulder	Behavioural ecology
Dr Allyson O'Brien	Marine pollution, ecology, and environmental management
A/Prof Suzie Reichman	Pollution impact and management
Dr Nick Robinson	Aquaculture breeding and genetics
Dr Karen Rowe	Ecology and conservation using museum collections and acoustics
Dr Kevin Rowe	Integrative mammalogy: taxonomy, evolution, genomics, morphology, conservation biology
Dr Darren Southwell	Adaptive management and optimal monitoring of threatened species
Dr Perran Stott-Ross	Environmental stress, evolution, entomology and endosymbionts
Prof. Devi Stuart-Fox	Evolutionary ecology
Prof. Steve Swearer	Marine ecology, evolution, and environmental management
Dr Joshua Thia	Population genomics, evolutionary biology, and applied science
A/Prof. Paul Umina	Insect ecology and management
Dr Belinda van Heerwaarden	Climate change adaptation
Prof. Madeleine Van Oppen	Marine ecology and evolution
A/Prof. Peter Vesk	Ecology, conservation and management; plants and vegetation
Dr Fletcher Warren-Myers	Marine ecology and aquaculture
Dr Andrew Weeks	Conservation biology
Dr Matt West	Applied ecology and wildlife conservation
Dr Bonnie Wintle	Conservation ecology / CEED
Professor Brendan Wintle	Conservation and ecology
Dr Qiong Yang	Insect pest and endosymbionts

Molecular, Cellular and Developmental Biology

Research groups within the Molecular, Cellular and Developmental Biology (MCDB) domain use genetic, biochemical, molecular and cellular approaches to investigate and manipulate fundamental biological processes across species that span the tree of life. Researchers study a broad range of species

from viruses and bacteria to plants and animals. We share research strengths in plant biology, genetics and reproduction. We are united through the use of molecular approaches but have varied applications and model species which create a rich and interdisciplinary environment with a broad diversity of course and research offerings to students.

Supervisors

Prof. Alex Andrianopoulos	Microbial and developmental genetics
Prof. David Balding	Statistical genomics
Prof. Phil Batterham	Neurogenetics, behaviour and systems biology in insects
Dr Simon Baxter	Applied pest control; pest biology
Dr Michael Duffy	Malaria pathogenesis and nuclear biology
Dr Berit Ebert	Plant cell wall biosynthesis
Dr Mary Familiari	Developmental biology
Dr Jane Fenelon	Reproductive and developmental biology
Dr Alex Fournier-Level	Adaptive evolution
Dr Stephen Frankenberg	Mammalian early development and stem cells
Dr Irene Gallego Romero	Human evolution and functional genomics
Prof. David Gardner	Reproductive biology
Dr John Golz	Developmental regulation and translational research
Dr Jason Goodger	Plant natural products
Dr Christopher Dean Goodman	Malaria biology and host-vector interactions
Dr Mark Green	Reproductive biology
Dr Alexandra Harvey	Embryonic stem cells
Dr Mike Haydon	Plant cell signalling
Prof. Joshua Heazlewood	Plant glycomics
Dr Alexander Idnurm	Fungal biology
A/Prof. Alex Johnson	Plant and food biotechnology
Dr Patricia Jusuf	Neural development and regeneration, and disease modelling and treatment screening
Dr Edwin Lampugnani	Plant evolution and development
Prof. Stephen Leslie	Statistical Genetics/Genomics
Prof. Geoffrey McFadden	Malaria and endosymbiosis
Dr Michael Murray	Developmental genetics of <i>Drosophila</i>
A/Prof. Ed Newbiggin	Pollen biology
Prof. Andrew Pask	Evolution, development and reproduction
Dr Trent Perry	Insecticide biology, neurogenetics, parasitic biology of the blowfly
Prof. Marilyn Renfree	Reproductive and developmental biology

<u>Dr Charles Robin</u>	Insect population genetics and molecular evolution
<u>Prof. Ute Roessner</u>	Abiotic stress adaptation and tolerance
<u>Dr Marc Somssich</u>	Plant-Fungal interactions and plant cell walls
<u>Dr Michael Stumpf</u>	Theoretical systems biology
<u>Dr Gerard Tarulli</u>	Reproductive and developmental biology
<u>Dr Allison Van de Meene</u>	Plant cell biology using high-end microscopy techniques
<u>Dr Angela Van de Wouw</u>	Plant pathogen interactions
<u>Dr Heroen Verbruggen</u>	Marine genomics and microbiology
<u>Dr Robert Walker</u>	Plant, soil and microbe interactions
<u>Prof. Michelle Watt</u>	Plant root system discovery and application to human and environmental challenges

Prof. Alex Andrianopoulos - Microbial and developmental genetics

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Developmental and Cellular Genetics](#) | [Microbiology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Understanding the molecular genetic mechanisms that regulate cellular morphogenesis and virulence in the human pathogen *Talaromyces marneffei*.
- Understanding the molecular genetic mechanisms that regulate development in the eukaryotic model organism *Aspergillus nidulans*

Potential Projects:

- Genomic approaches to identifying and characterising genes important for infection
- Dissecting the molecular and cellular aspects of host-pathogen interactions
- Molecular genetic characterisation of transcriptional factors, and their circuits, controlling development
- Genetic and genomic approaches to improve bioethanol production.



Email:

alex.a@unimelb.edu.au

Website:

<https://blogs.unimelb.edu.au/fungalgenetics/>

Prof. David Balding - Statistical genomics

[Back to top](#) | [Melbourne Integrative Genomics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Computational/statistical problems in population
- Evolutionary, medical and forensic genetics

Potential Projects:

- The population history of indigenous Australians: what can the available genetic data tell us?



Email:

dbalding@unimelb.edu.au

Website:

<https://blogs.unimelb.edu.au/statisticalgenomics/>

Google Scholar:

<https://scholar.google.com.au/citations?user=9bqHVEsAAAAJ&hl=en>

Dr Luke Barrett - Marine ecology and sustainable aquaculture

[Back to top](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

My research is mostly concerned with understanding and minimising human impacts on the coastal marine environment, especially topics are around (1) maintaining biodiversity under pressure from fishing, poor water quality and invasive species, and (2) guiding responsible expansion of marine aquaculture as a source of sustainable food for the global population. I primarily work within Prof Tim Dempster's sustainable aquaculture lab (SALTT).

- Marine ecology
- kelp reef conservation
- sustainable aquaculture
- animal welfare in aquaculture

Potential Projects:

- Global trends in marine aquaculture infrastructure (with Prof Tim Dempster)
- Sea urchins and lost predators in Port Phillip Bay (with Prof Tim Dempster and Dr Fletcher Warren-Myers)



Email:

luke.barrett@unimelb.edu.au

Website:

<http://lukebarrett.org>

Google Scholar:

<https://scholar.google.com.au/citations?user=m2VurpgAAAAJ&hl=en>

Prof. Phil Batterham - Neurogenetics, behaviour and systems biology in insects

[Back to top](#) | [Developmental and Cellular Genetics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Role of insecticides in the demise of non-pest insect populations

Potential Projects:

- The molecular and cellular impact of insecticides in insects
- The impact of insecticides on insect behaviour and fitness
- The impact of insecticides on thermotolerance and immunity in insects



Email:
p.batterham@unimelb.edu.au

Website:
<http://www.bio21.unimelb.edu.au/batterham-group>

Google Scholar:
<https://scholar.google.com/citations?hl=en&user=-0dTXHUAAAAJ>

Dr Simon Baxter - Applied pest control; pest biology

[Back to top](#) | [Biotechnology and Translational Research](#) | [Population and Quantitative Genetics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Genetic technology to improve insect pest control
- Evolution and spread of insecticide resistance
- Whole genome sequencing of insect pests
- Adaptive evolution

Potential Projects:

- Genetic modification of insects for pest control (with Dr Trent Perry)
- Tracking the evolution of insecticide resistance in Australian moths
- Evolution of insect Y-chromosomes
- Bacillus thuringiensis pore forming toxins: structure and function



Email:
simon.baxter@unimelb.edu.au

Website:
<https://www.bio21.unimelb.edu.au/baxter-group>

Google Scholar:
<https://scholar.google.com/citations?user=rSoC5boAAAAJ&hl=en>

Dr Joanne Birch - Plant Evolution

[Back to top](#) | [Plant Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Systematics of flowering plants
- Biogeography of Australasian and Pacific plant lineages
- Genome evolution in Australian monocotyledons
- Evolution of ecological and morphological diversity in Australian monocotyledons
- Integrative taxonomic approaches to species delimitation
- Molecular species delimitation methods

Potential Projects:

- Systematics and biogeography of Australasian monocotyledons
- Recovering relationships of Australasian Asteliaceae using whole chloroplast sequence data
- Evolution of genome size in Australian Asparagales
- Phylogeography of *Caesia* or *Corynotheca* species complexes



Email:

joanne.birch@unimelb.edu.au

Website:

<https://jlbirch.wordpress.com/>

A/Prof. Anthony Boxshall - Marine ecology, coastal climate adaptation, pollution impact and management, and environmental sciences

[Back to top](#) | [Marine Biology](#) | [Pollution Impact and Management](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Integrating environmental research into practice in Government
- Pollution Impacts and Management (plastics, faecal matter, PFAS and other pollutants)
- Marine and Coastal adaptation to climate change.
- Ecological engineering and habitat restoration.
- Citizen science.
- Science Communication.

Potential Projects:

- Ecological impacts of microplastics in Port Phillip Bay. This project will involve collecting field data on microplastic fibres and running laboratory experiments to test if they accumulate in fish and invertebrates. (with Dr Allyson O'Brien and Prof. Mick Keough)
- Assessing the social acceptance of using nature-based coastal defence structures in Victoria (with Dr Beth Strain).
- I am interested in co-supervision for other MSc projects that have a demonstrable potential impact into policy, management, planning or regulation. My involvement will be focused on the integration of research outcomes into Government practice.



Email:
boxshall.a@unimelb.edu.au

Website:
<http://www.linkedin.com/in/anthony-boxshall>

Dr Natalie Briscoe - Ecology and global change biology

[Back to top](#) | [Conservation and Climate Change](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Climatic constraints and adaptation
- Species distribution modelling
- Ecophysiology
- Thermal ecology
- Conservation biology



Potential Projects:

- Investigating risk of heat stress in the greater stick-nest rat
- How does intra-specific trait variation affect species distributions?

Email:

nbriscoe@unimelb.edu.au

Google Scholar:

[https://scholar.google.com.au/citations?hl=en&user=F-](https://scholar.google.com.au/citations?hl=en&user=F-GA72EAAAAJ&view_op=list_works&sortby=pubdate)

[GA72EAAAAJ&view_op=list_works&sortby=pubdate](https://scholar.google.com.au/citations?hl=en&user=F-GA72EAAAAJ&view_op=list_works&sortby=pubdate)

[GA72EAAAAJ&view_op=list_works&sortby=pubdate](https://scholar.google.com.au/citations?hl=en&user=F-GA72EAAAAJ&view_op=list_works&sortby=pubdate)

Dr Paolin Rocio Cáceres Vélez - Therapies and genetics underlying neuronal cell health

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Biotechnology and Translational Research](#) | [Developmental and Cellular Genetics](#)

Research Interests:

- Australian botanical compounds to treat visual disorders
- Mechanisms of gene modulation
- Mitochondria-targeted antioxidant therapies
- Preclinical tests using zebrafish as a model



Email:

paolin.caceresvelez@unimelb.edu.au

Website:

<https://blogs.unimelb.edu.au/jusuflab/>

Google Scholar:

[https://scholar.google.com.au/citations?](https://scholar.google.com.au/citations?%20user=qZ3ecIwAAAAJ&hl=en&user=zfqtrv8AAAAJ)

[%20user=qZ3ecIwAAAAJ&hl=en&user=zfqtrv8AAAAJ](https://scholar.google.com.au/citations?%20user=qZ3ecIwAAAAJ&hl=en&user=zfqtrv8AAAAJ)

Potential Projects:

- Therapeutic capacity of Australian plant derived antioxidants on visual disorders via gene expression modulation using zebrafish visual system as a model

Dr Melissa Carew - Freshwater biological monitoring

[Back to top](#) | [Conservation and Climate Change](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Aquatic macroinvertebrates
- Ecological impacts of aquatic pollution
- DNA barcoding
- Application of next-generation sequencing
- Environmental monitoring
- Molecular taxonomy
- Molecular ecology

Potential Projects:

- Using DNA barcodes to investigate the macroinvertebrate diversity and ecology in catchments
- Detecting environmental impacts on macroinvertebrates in the Yarra River using next-gen sequencing



Email:
mecarew@unimelb.edu.au

Website:
<https://blogs.unimelb.edu.au/pearl/melissa-carew/>

Google Scholar:
<https://scholar.google.com/citations?user=urWu0HMMAAAJ&hl=en&oi=ao>

A/Prof. Rob Day - Marine ecology, aquaculture, fisheries, climate change effects on marine animals

[Back to top](#) | [Conservation and Climate Change](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Abalone aquaculture: growth, stress and immune function
- Climate change effects on aquaculture species
- Shark and shark fisheries population dynamics and management
- Reproductive biology of Sharks (With Dr Terry Walker)
- Evolutionary change due to domestication in aquaculture

Potential Projects:



Email:
r.day@unimelb.edu.au

- How abalone respiration is affected by Climate Change. No-one has yet studied abalone respiration under flow! As flow moves water over the gills, this project will break new ground, internationally. We will use the new method to investigate climate change effects.
- How Climate Change may affect abalone feeding, behaviour, and immunity. A 2nd student would partner to set up temperature and pH treatments, and look at behaviour, feeding, and immune function, with expert advice from Dr Sabine Roussel in France. We look forward also to student exchanges between France and our lab.
- Changes in behaviour and other traits between wild and farm abalone. Farm abalone have been selected for farm conditions. But the changes in many traits are unknown. This project would explore changes such as escape responses to predators, compared to wild abalone, again with advice from Sabine Roussel.

Website:
<https://robdavabalone.wordpress.com>

Google Scholar:
https://scholar.google.com/citations?user=2vrJw_cAAAAJ&hl=en&oi=sra

A/Prof. Tim Dempster - Marine ecology and aquaculture

[Back to top](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

The lab works on many topics within sustainable aquaculture and fisheries, and more broadly in aquatic and terrestrial ecology. Within aquaculture, we try to solve the environmental and animal welfare problems aquaculture creates by working both inside and outside aquaculture systems.

- Environmental impacts
- Animal behaviour
- Host-parasite interactions
- Aquaculture technology

Potential Projects:

- Ecological effects of aquaculture in marine ecosystems (travel to Norway for research)
- Marine ecosystem rehabilitation using aquaculture techniques and technologies
- Parasite control and prevention in aquaculture (travel to Norway for research)



Email:
dempster@unimelb.edu.au

Website:
<http://blogs.unimelb.edu.au/salt/>

Google Scholar:
<https://scholar.google.com/citations?user=8xcTkRMAAAAJ&hl=en&oi=ao>

A/Prof. Andrew Drinnan - Plant development, morphology, anatomy, architecture and evolution

[Back to top](#) | [Plant Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

I investigate the morphology and development of plants to model of plant architecture and evolution. Projects are available on all groups from liverworts to flowering plants. You will gain a wide range of core botanical knowledge and skills, including plant diversity and relationships, plant anatomy and developmental morphology, plant evolution, and microscopy techniques.

- Development and evolution of non-flowering land plants
- Floral development
- Plant anatomy and morphology
- Palaeobotany and the study of fossil plants

Potential Projects:

- Projects are available on all groups from liverworts to flowering plants



Email:
and@unimelb.edu.au

Website:
<http://svbh.academia.edu/AndrewDrinnan>

Dr Michael Duffy - Malaria pathogenesis and nuclear biology

[Back to top](#) | [Developmental and Cellular Genetics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- The malaria parasite *Plasmodium falciparum* employs novel chromatin proteins to regulate gene expression in its pared back genome, some of these proteins are possible drug targets. *P. falciparum* also employs a diverse armoury of variant surface proteins to hide from immunity, but only some of these proteins cause severe disease and possibly they could be used in a life-saving vaccine.

Potential Projects:



Email:
mduffy@unimelb.edu.au

Website:

<https://blogs.unimelb.edu.au/duffy-lab/>

Google Scholar:

<https://orcid.org/0000-0001-5635-4033>

Dr David Duncan - integrity of native ecosystems in human dominated landscapes

[Back to top](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

I am an applied plant ecologist interested in the integrity of native ecosystems in human dominated landscapes. Consequently, my research involves plant reproductive biology, native vegetation management, ecological restoration, monitoring design and the evaluation of conservation interventions.

- Native vegetation management
- Evaluation of environmental interventions and programs
- Monitoring design
- Pollination ecology
- Restoration ecology
- Ecological modelling

Potential Projects:

- Adaptive management of threatened ecological communities
- Determining reproductive age limits in long-lived *Allocasuarina luehmannii*
- Population viability analysis for keystone habitat species
- Expert opinions of native vegetation offsets; trading size and quality
- Vertebrate herbivore impacts on threatened species and communities



Email:

david.duncan@unimelb.edu.au

Website:

<https://daviddotduncan.wordpress.com>

Google Scholar:

<https://scholar.google.com.au/citations?user=u4sGXUYAAAAJ&hl=en>

Dr Berit Ebert - Plant cell wall biosynthesis

[Back to top](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- glycosylation
- plant cell wall
- membrane transporters
- glycosyltransferases
- subcellular partitioning
- endomembrane and Golgi apparatus
- protein-protein interactions
- cell wall analytics

Potential Projects:

- Investigating the functions of glycosyltransferases involved in cell wall biosynthesis
- Studying Golgi transporter mutants required for glycan biosynthesis
- Determining protein-protein interactions required for cell wall biosynthesis
- Using live cell imaging to study the localization of Golgi-localized proteins



Email:
berit.ebert@unimelb.edu.au

Website: <https://ebert-lab.science.unimelb.edu.au/>

Google Scholar:
<https://scholar.google.com.au/citations?user=N1yr9JYAAAAJ&hl=en>

Prof. Mark Elgar - Evolutionary ecology

[Back to top](#) | [Evolution and Behaviour](#) | [Pollution Impact and Management](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Animal behaviour
- Chemical communication
- Mating strategies
- Sexual conflict
- Social behaviour
- Signals and inter-specific mutualisms

Potential Projects:



Email:
m.elgar@unimelb.edu.au

- Anti-aphrodisiac signals in beetle mating systems
 - Significance of ant alarm pheromones
 - Effects of diet on chemical signals
 - Impact of air pollution on insect chemical sensory perception
-

Dr Nancy Endersby-Harshman - Insecticide resistance, ecology and population genetics

[Back to top](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

As part of PEARG, I conduct research on the dengue vector mosquito, *Aedes aegypti*, in the fields of insecticide resistance, population genetics, *Wolbachia pipientis* and vector ecology.

- Entomology, insecticide resistance, ecology and population genetics

Potential Projects:

- Understanding environmental effects of antibiotics on *Wolbachia* infected mosquitoes

Google Scholar:
<https://scholar.google.com/citations?user=aawRWmIAAAAJ&hl=en>



Email:
nancy@unimelb.edu.au

Website:
<https://blogs.unimelb.edu.au/pearg/nancy-endersby-harshman/>

Dr Mary Familiari - Developmental biology

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

We use techniques of cell and molecular biology to investigate the early development of possum embryos, gonad development (mouse and human) and the effects of pollution on human placental.

Potential Projects:

- Effect of air pollution particles on human placental function
- Biomarker discovery for human ovarian integrity and function



Email:
m.familiari@unimelb.edu.au

Website:
<http://familiarilab.biosciences.uom.org.au>

Google Scholar:
<https://scholar.google.com/citations?user=eXV7uRMAAAAJ&hl=en&oi=sra>

Dr Jane Fenelon - Reproductive and developmental biology

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

My research focuses on two main research areas: embryonic diapause as a model for embryo-uterine communication and echidna development and reproduction

- Embryonic diapause
- Uterine-embryo signalling
- Embryo development
- Echidna embryology
- Echidna sexual development and differentiation
- Comparative reproduction.

Potential Projects:



Email:
fenelonj@unimelb.edu.au

- Early embryonic and post-natal development of the echidna
- Embryonic diapause and uterine-embryo communication

Website:

<http://renfreshawlab.biosciences.uom.org.au/>

Google Scholar:

<https://scholar.google.com/citations?user=kXbv72QAAAAJ&hl=en>

Dr Alex Fournier-Level - Adaptive evolution

[Back to top](#) | [Conservation and Climate Change](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

My group focuses on adaptive evolution, primarily in natural plant populations. We are particularly interested in adaptation to climate change and evolution of resistance to herbicide/insecticide

Potential Projects:

- **Parallel evolution: the many roads leading to Rome.** A genome contains thousands of genes that can all mutate in multiple ways, but yet we observe very recurrent patterns of evolution in a handful of key genes. Using the best curated data on the genomics of life history, we are interested in studying recurrent but independent evolution so that genome-wide association can detect the extent of parallel evolution.
- **From home court advantage to home court consistence.** Local adaptation whereby a local strain has evolved an adaptive advantage in widespread. However, in times of uncertainty about future climates, we are interested in understanding how organisms can introduce some variation in their traits to explore different evolutionary strategy. In particular, we want to test if individuals tend to show more random trait variation when exposed to climates that are more foreign to them.



Email:

afournier@unimelb.edu.au

Website: <http://adaptive-evolution.biosciences.unimelb.edu.au/>

Google Scholar:

<https://scholar.google.com/citations?user=CsFE84AAAAJ&hl=en&oi=ao>

Dr Stephen Frankenberg - Mammalian early development and stem cells

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Marsupial stem cells and germ cells
- Evolution of reproduction and development in vertebrates
- Gene editing technologies with application to conservation
- Genomics

Potential Projects:

- Conferring resistance to cane toad toxin in the northern quoll by gene editing



Email:
sfr@unimelb.edu.au

Google Scholar:
https://scholar.google.com/citations?hl=en&user=Fk_RvmoAAAAJ

Dr Irene Gallego Romero - Human evolution and functional genomics

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Melbourne Integrative Genomics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

We study human evolution and population history, focusing both on recent adaptive and change (with a specific focus on the peopling of Island Southeast Asia) as well as far older differences between humans and archaic hominins like Denisovans and Neanderthals, or between humans and the great apes, our closest living relatives. Some of our research makes use of novel functional genomics methods and pluripotent stem cells, some of it is fully computational.

- Human evolution
- Pluripotent stem cells as model for human evolutionary biology
- great ape diversity
- The peopling of Island Southeast Asia and Remote Oceania
- Archaic hominin introgression

Potential Projects:



Email:

- Genetic diversity in public chimpanzee data sets: truly representative of the species?
- Dissecting the molecular basis of human adaptation to high altitude in the Andes and the Himalayas
- How robust are gene regulatory networks between populations?
- Developing a comprehensive chimpanzee transcriptome
- Mapping differences protein-protein interactions across three islands in Indonesia
- Investigating the portability of polygenic risk scores across populations (cosupervised with Dr David Ascher)
- Genetic mechanisms behind torpor in the mountain pygmy possum (cosupervised with Dr Andrew Weeks)

irene.gallego@unimelb.edu.au

Website: <https://igr-lab.science.unimelb.edu.au/>

Google Scholar:
<https://scholar.google.com.au/citations?user=1hptO8sAAAAJ&hl=en>

Prof. David Gardner - Reproductive biology

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Human IVF
- Preimplantation embryo culture
- Nutrition
- Metabolism
- Embryo viability
- Biomarkers
- Epigenetics
- Metabolic function
- Metaboloepigenetics
- Cryobiology

Potential Projects:

- Biomarkers of human embryo viability (non-invasive analysis)
- Impact of antioxidants during IVF and embryo culture
- Oxidative stress in human oocytes and sperm
- Metabolism of human oocytes and sperm
- Metaboloepigenetics - how metabolic function regulates the epigenome



Email:
david.gardner@unimelb.edu.au

Google Scholar:
<https://scholar.google.com.au/citations?user=vNj-urYAAAAJ&hl=en&oi=ao>

Dr John Golz - Developmental regulation and translational research

[Back to top](#) | [Biotechnology and Translational Research](#) | [Developmental and Cellular Genetics](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

Our group uses a combination of genetics, molecular, and cellular biology to investigate seed development. Specifically, we are interested in knowing how cell types are specified during the early stages of embryogenesis and in identifying the genetic pathways regulating cellular differentiation in the protective layers surrounding the developing embryo - the seed coat. We are interested in improving genetic transformation technology for the rapid characterisation of agronomically important genes in crop plants. This technology will then be applied to the modification of seed size and fatty acid content in crop plants such as the superfood chia.

Potential Projects:

- Investigating transcriptional networks regulating seed size in plants
- Genetic control of root mucilage - the nexus between roots and the rhizosphere (with Dr Berit Ebert)
- Defining transcriptional networks in the basal land plant *Marchantia* (with Dr Edwin Lampugnani)
- Improving germline transformational efficiency in canola
- Developing transformation and gene editing technologies for the superfood Chia (with Prof Ute Roessner)



Email:
jgolz@unimelb.edu.au

Website:
<http://blogs.unimelb.edu.au/golzlab/>

Google Scholar:
<https://scholar.google.com.au/citations?hl=en&user=7FC8VMcAAAAJ>

Dr Jason Goodger - Plant natural products

[Back to top](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Bioprospecting pharmaceuticals from Australian plants
- Plant-animal interactions mediated by plant chemicals

Potential Projects:



Email:
jgoodger@unimelb.edu.au

- Pharmaceutical flavonoids from Eucalyptus: the beginnings of a new industry. In collaboration with Greta's Australia Pty Ltd
- Commercial eucalyptus oil plantations: growing super trees for the future. In collaboration with FGB Natural Products

Google Scholar:
<https://scholar.google.com.au/citations?user=7Zw4YXwAAAAJ&hl=en>

Dr Christopher Dean Goodman - Malaria biology and host-vector interactions

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Developmental and Cellular Genetics](#) | [Microbiology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

Understanding the genetic and molecular biology of malaria parasites and their interactions with mosquito vectors

- malaria
- drug resistance
- host-vector interactions
- transmission

Potential Projects:

- The genetic trap - how malaria's complex life cycle can be used to develop resistance-proof drugs
- When mosquitoes get malaria - understanding host parasite interactions during transmission
- Molecular control of organellar inheritance in apicomplexan parasites



Email:
deang@unimelb.edu.au

Google Scholar:
<https://scholar.google.com/citations?user=2wdsE8AAAAJ&hl=en>

Dr Mark Green - Reproductive biology

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Biotechnology and Translational Research](#) | [Pollution Impact and Management](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Assisted reproductive technologies
- Environmental endocrine disruptors
- Developmental origins of adult disease
- Oocyte quality
- Embryo development
- Sperm microfluidics
- Mitochondrial function
- In vitro fertilisation
- Phenotype of IVF children
- Health of cloned animals
- Sex ratio
- Anti-oxidants and reproduction

Potential Projects:

- Determining the effects of endocrine disruptors and pollutants on embryo development and metabolism, as well as sperm quality
- Investigating the effects of exposure to endocrine disruptors on human fertility and health
- In vitro culture supplements to improve oocyte maturation systems for human and animal embryo culture



Email:

mark.green@unimelb.edu.au

Website:

<http://greenlab.biosciences.uom.org.au/>

Google Scholar:

<https://scholar.google.com/citations?user=pqVPFHUAAAAJ&hl=en&oi=ao>

Dr Xinyue Gu - Molecular entomology, endosymbionts, environmental stress

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Evolution and Behaviour](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

Our current research aims to apply endosymbionts in pest and disease control programs through microinjection. Other areas of interest include

CRISPR and RNAi in Drosophila and temperature adaptation studies.

- Integrated management of agricultural pests
- Making new strains for pest control
- Novel approaches for suppressing arboviral disease vectors

Potential Projects:

- Investigating Wolbachia-host interactions and control arthropod-borne disease with transinfection
- Heat tolerance selection in Australian aphids
- Making novel mosquito strains for Dengue control



Email:
xjgu2@unimelb.edu.au

Website:
<https://blogs.unimelb.edu.au/pearg/xinyue-gu/>

Google Scholar:
https://scholar.google.com.au/citations?hl=en&user=bgr-_JkAAAAJ

Dr Gurutzeta Guillera-Arroita - Quantitative ecology

[Back to top](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Ecological modelling
- Ecological statistics
- Species distribution modelling
- Community modelling
- Wildlife monitoring
- Imperfect detection
- Optimal survey design

Potential Projects:

- Applying and comparing methods for modelling species range dynamics



Email:
gguillera@unimelb.edu.au

Website:
<https://gguilleraresearch.wordpress.com>

Google Scholar:
[https://scholar.google.com/citations?
user=ZClrTegAAAAJ&hl=en&oi=ao](https://scholar.google.com/citations?user=ZClrTegAAAAJ&hl=en&oi=ao)

Dr Alexandra Harvey - Embryonic stem cells

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Extracellular environment
- The legacy of culture on cell function
- Metabolism, mitochondria, cell signalling, oxygen regulation, redox, endocrine disrupting chemicals, neural differentiation, epigenetics

Potential Projects:

- Defining the impact of culture on induced pluripotent stem cell quality and metabolism
- Redox regulation of uncoupling proteins in embryonic stem cells



Email:
ajharvey@unimelb.edu.au

Google Scholar:
<https://scholar.google.com.au/citations?hl=en&user=HeoTMx8AAAAJ>

Dr Mike Haydon - Plant cell signalling

[Back to top](#) | [Biotechnology and Translational Research](#) | [Developmental and Cellular Genetics](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

We study circadian rhythms in plants with a focus on metabolic signalling. We use genetics and molecular biology, chemical genetics and biochemistry to understand how metabolic signalling pathways control gene expression and drive adaptation to the rhythmic environment. Projects in the lab explore the interactions between metabolic signals such as sugars, reactive oxygen species and ethylene within the circadian system and how they help plants adjust metabolism, growth and development throughout the day and across seasons. This knowledge could generate tools to grow crops that are better adapted to their environment.

Potential Projects:

- Superoxide as a metabolic signal in the plant circadian clock



Email:
m.haydon@unimelb.edu.au

- The role of synaptotagmin in metabolic signalling in plant cells
- Fine-tuning metabolic signalling in plants with kinase inhibitors
- Using chemical biology to modify metabolic signalling and growth in crops and weeds

Website:

<https://blogs.unimelb.edu.au/haydonlab/>

Google Scholar:

<https://scholar.google.com.au/citations?hl=en&user=3uBMUD0AAAAJ>

Prof. Joshua Heazlewood - Plant glycomics

[Back to top](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

The biosynthesis of complex glycans within the plant cell requires a range of coordinated processes. My research group employs advanced analytical tools (mass spectrometry) to examine glycosylation processes and how metabolic partitioning influences their biosynthesis.

- a

Potential Projects:

- Characterization of of Golgi nucleotide sugar transporter mutants and their impact on cell wall composition
- Characterization of GPI anchor proteins from plants by tandem mass spectrometry
- Profiling arbinogalactan proteins from Arabidopsis by tandem mass spectrometry
- Isolation of N-glycan binding proteins from plants by tandem mass spectrometry
- Biochemical identification of agarose synthase from red algae
- Profiling vitamin k levels by mass spectromtry in plants and food products



Email:

jheazlewood@unimelb.edu.au

Website:

<http://www.heazleome.org/contact.html>

Google Scholar:

<https://scholar.google.com/citations?user=2aq3NPUAAAAJ>

Prof. Ary Hoffmann - Pest and environmental adaptation

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Conservation and Climate Change](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Environmental stress adaptation
- Integrated management of agricultural pests
- Novel approaches for suppressing arboviral disease vectors

Potential Projects:

- MIDYEAR. Manipulating bacterial symbionts for agricultural pest control
- MIDYEAR. Evaluating the long-term potential of Wolbachia for dengue control
- MIDYEAR. Understanding environmental effects of antibiotics on Wolbachia infected mosquitoes



Email:
ary@unimelb.edu.au

Website:
<http://www.bio21.unimelb.edu.au/hoffmann-group>

Google Scholar:
<https://scholar.google.com.au/citations?user=vWNn8owAAAAJ&hl=en>

Dr Luke Holman - Evolutionary ecology

[Back to top](#) | [Evolution and Behaviour](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Evolutionary ecology
- Sexual selection/conflict
- Social evolution
- Evolutionary constraints
- Animal signals
- Selfish genes
- Phenotypic plasticity
- Theoretical models

Potential Projects:



Email:
luke.holman@unimelb.edu.au

- Measuring intragenomic conflict using quantitative genetics in insects
- Experimental evolution in insects - removing selection on one sex to see how the other evolves
- Searching for queen pheromones in Australian social insects

Website:
<https://www.lukeholman.org/>

Google Scholar:
<https://scholar.google.com.au/citations?user=9WXgCXUAAAAJ&hl=en>

Dr Alexander Idnurm - Fungal biology

[Back to top](#) | [Microbiology](#) | [Mycology and Plant Pathology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Host-pathogen interactions
- Plant pathology
- Medical mycology
- Evolution of mating-type determination

Potential Projects:

- Identification of virulence factors in *Leptosphaeria maculans* or *Cryptococcus neoformans*
- Genetics of ballistospore formation and release in basidiomycete fungi
- MIDYEAR. Molecular tool development in fungi relevant to the grains industry
- MIDYEAR. Mechanisms of antifungal drug resistance



Email:
alexander.idnurm@unimelb.edu.au

Website:
<https://blog.unimelb.edu.au/mycology>

Google Scholar:
<https://scholar.google.com.au/citations?user=rizOUBgAAAAJ&hl=en>

Prof. Greg Jenkins - Marine ecology

[Back to top](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Fish ecology
- Connectivity
- Recruitment variability
- Fish-habitat relationships
- Early life history of fish
- Environmental impacts
- Seagrass ecology
- Environmental risk assessment
- Biophysical modelling

Potential Projects:

- Effects of suspended sediments and other environmental impacts on marine fish ecology and behaviour
- Planktonic food-chain pathways to larval fish feeding and recruitment variability
- Ecology of reef fish in Port Phillip Bay



Email:

gjenkins@unimelb.edu.au

Website:

<https://blogs.unimelb.edu.au/fisheries-ecology/>

Google Scholar:

<https://scholar.google.com.au/citations?user=Kbip3jQAAAAJ&hl=en>

A/Prof. Alex Johnson - Plant and food biotechnology

[Back to top](#) | [Biotechnology and Translational Research](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Plant nutrition
- Genetic engineering
- Plant cell and molecular biology
- Biofortification

Potential Projects:



Email:

johnsa@unimelb.edu.au

- Genome editing of rice to improve nutrition
- Allelic diversity of genes essential for micronutrient transport in wheat
- Field trials of genetically modified wheat with iron-enriched grain

Website:

<https://alexjohnsonlab.com>

Google Scholar:

<https://scholar.google.com/citations?user=scCgL9IAAAAJ&hl=en&oi=sra>

Dr Therésa Jones - Behavioural ecology, Urban Light Pollution and Evolutionary Ecology

[Back to top](#) | [Evolution and Behaviour](#) | [Pollution Impact and Management](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Invertebrate mating systems
- Sexual selection
- Ecological light pollution

Potential Projects:

- Behavioural responses to multi-modal pollutants



Email:

theresa@unimelb.edu.au

Website:

<https://urbanlightlab.com>

Google Scholar:

<https://scholar.google.com/citations?user=OQ3w118AAAAJ&hl=en&oi=ao>

Dr Patricia Jusuf - Neural development and regeneration, and disease modelling and treatment screening

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Biotechnology and Translational Research](#) | [Developmental and Cellular Genetics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

Using the zebrafish model for visual neuroscience: Understanding gene networks during vertebrate development and pro-regenerative signals that drive adult nerve cell regeneration, modelling human visual disorders and screening for treatment strategies.

- Retinal development
- Regeneration in the adult central nervous system
- Glaucoma
- Myopia

Potential Projects:

- Therapeutic capacity of Australian plant derived antioxidants on visual disorders via gene expression modulation using zebrafish visual system as a model - led with Paolin Caceres Velez.



Email:
patricia.jusuf@unimelb.edu.au

Website:
<http://blogs.unimelb.edu.au/jusuffab/>

Google Scholar:
<https://scholar.google.com.au/citations?user=RW6SvYoAAAAJ&hl=en>

Prof. Michael Kearney - Physiological ecology, climate change responses, metabolic ecology, insect conservation, grasshopper biology

[Back to top](#) | [Conservation and Climate Change](#) | [Evolution and Behaviour](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

We combine field, lab and modelling work to understand what limits where species can and can't live, how they use their habitats, how they are adapted to their environments, and how we can use this information to manage species for conservation, agriculture and health



- Climatic constraints and adaptation
- Niche and distribution modelling
- Life history
- Biophysical ecology
- Ecophysiology
- Metabolic theory
- Biogeography
- Parthenogenesis

Potential Projects:

Email:

m.kearney@unimelb.edu.au

Website:

<https://camel.science.unimelb.edu.au/#tabmain>

Google Scholar:

<https://scholar.google.com.au/citations?user=syZcRdgAAAAJ&hl=en>

Prof. Mick Keough - Marine ecology

[Back to top](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Resilience of invertebrate communities to natural and anthropogenic disturbances
- Evolutionary biology of invertebrate larvae

Potential Projects:

- Resilience of nearshore ecological communities to disturbance
- Can marine invertebrates adjust their reproductive behaviour in response to environmental stress?



Email:

mjkeough@unimelb.edu.au

Website:

<https://keolab.com/>

Google Scholar:

<https://scholar.google.com/citations?user=XTbVdscAAAAJ&hl=en>

Dr Jose Lahoz-Monfort - Ecological modelling

[Back to top](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Ecological modelling
- Statistical ecology
- Conservation technology
- Species distribution modelling
- Wildlife monitoring
- Demography and population dynamics.

Potential Projects:

- Testing the detection performance of a novel low-cost open-source acoustic sensor



Email:
jlahoz@unimelb.edu.au

Website:
<https://joselahozresearch.wordpress.com/>

Google Scholar:
<https://scholar.google.com/citations?user=T817Qj8AAAAJ&hl=en&oi=ao>

Dr Edwin Lampugnani - Plant evolution and development

[Back to top](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

I use two genetic model systems from opposite ends of the evolutionary spectrum of land plants, the flowering plant *Arabidopsis* and the liverwort *Marchantia*, to better understand the molecular mechanisms of polysaccharide synthesis.

- Plant Evolution and Development
- Plant cell wall synthesis
- Protein-protein interactions
- Intracellular trafficking
- Live cell imaging



Email:

Potential Projects:

- How did vascular tissues evolve in plants?
- Cloning and characterisation of genes encoding polysaccharide synthases
- Using CRISPR technology to modify plant cell walls
- Determining evolutionarily conserved protein-protein interactions in cell wall synthesis

Edwin.Lampugnani@unimelb.edu.au

Google Scholar:

<https://scholar.google.com.au/citations?user=jg2dHBkAAAAJ&hl=en>

Prof. Stephen Leslie - Statistical Genetics/Genomics

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Melbourne Integrative Genomics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

Statistical and population genetics

- Detecting and controlling for population structure
- Demographic inference
- Indigenous genomics
- Association studies
- Imputation of complex genetic variation (particularly HLA, KIR and other immune-associated loci)
- Immunogenetics
- Autoimmune disease
- Tree-sequences: efficient data structures for genetic data and statistical inference on these structures
- Statistical methods development

Bioinformatics

- Methods for single cell -omics analyses
- Assembly of long-read data
- Detecting structural variation
- Bioinformatic methods development

Potential Projects:

- Given the cross-disciplinary nature of the work in the research group, and the requirement for strong computational and statistical skills (or willingness to learn such skills), research projects will be tailored to the background and skills of the individual student, but will fall within one or more of the research interest areas listed above.



Email:

stephen.leslie@unimelb.edu.au

Website:

<http://sysgen.unimelb.edu.au/research/statistical-genetics-leslie>

Google Scholar:

<https://findanexpert.animelb.edu.au/profile/498733-stephen-leslie>

Dr James Maino - Insect spatial ecology

[Back to top](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Sustainable and integrated management of agricultural pests
- Quantitative approaches to forecasting insect pests
- Development of decision-making tools.

Potential Projects:



Email:
james.maino@unimelb.edu.au

Website:
<https://jamesmaino.com>

Google Scholar:
<https://scholar.google.com.au/citations?user=jHD4R20AAAAJ&hl=en>

Prof. Michael McCarthy - Ecology

[Back to top](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Ecological modelling
- Environmental decisions
- Fire ecology
- Imperfect detection

Potential Projects:

- Models to improve environmental management decisions
- Factors driving imperfect detection in ecological monitoring
- Modelling to improve fire management for biodiversity
- Testing environmental decision theory



Email:
mamcca@unimelb.edu.au

Website:
<http://mickresearch.wordpress.com>

Google Scholar:
<https://scholar.google.com/citations?user=vQ5iqnUAAAAJ&hl=en&oi=ao>

Prof. Geoffrey McFadden - Malaria and endosymbiosis

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Developmental and Cellular Genetics](#) | [Marine Biology](#) | [Microbiology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

The McFadden Lab identifies new drug targets in the malaria parasite and seeks strategies to control the ever increasing problem of drug resistance. We work with human and rodent malaria models and have a complete life cycle facility in which we infect mosquitoes to study transmission of the disease from vertebrate to vertebrate via insects.

Potential Projects:

- From symbiont to parasite - sugar transporters and the origins of malaria parasites
- The genetic trap – how malaria's complex life cycle can be used to develop resistance-proof drugs
- When mosquitoes get malaria – understanding host parasite interactions during transmission
- Molecular control of organellar inheritance in apicomplexan parasites



Email:

g.mcfadden@unimelb.edu.au

Website:

http://fad.webmate.me/McFadden_Lab/Home.html

Google Scholar:

<https://scholar.google.com.au/citations?user=pwd82ucAAAAJ&hl=en>

Dr Kathryn McNamara - Evolutionary ecology

[Back to top](#) | [Evolution and Behaviour](#) | [Microbiology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Sexual selection/conflict
- Chemical communication
- Invertebrate immunology

Potential Projects:

- The costs of immunity on sexually selected traits
- The gut microbiome and sexually selected trait
- The effect of diet on chemical signalling



Email:

mcnamara@unimelb.edu.au

Google Scholar:

<https://scholar.google.com.au/citations?user=uKoXU4oAAAAJ&hl=en&oi=ao>

Dr Iliana Medina Guzman - Evolutionary ecology

[Back to top](#) | [Evolution and Behaviour](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

Our group uses a combination of field based experiments, laboratory experiments, and comparative analyses to understand the evolution of behaviours and ecological strategies in animals.

- Behavioural and evolutionary ecology
- Macroevolution
- Avian brood parasitism

Potential Projects:

- MIDYEAR. The evolution of enclosed nests in Australia
- Genetic differentiation in an Australian aposematic bug
- MIDYEAR. Toxicity and colour evolution in aposematic bug



Email:

iliana.medina@unimelb.edu.au

Website:

<https://www.ecomedina.com>

Google Scholar:

<https://scholar.google.com.au/citations?user=qZ3ecIwAAAAJ&hl=en>

Dr Rebecca Morris - Marine ecology and coastal climate adaptation

[Back to top](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

The Coastal and Estuarine Adaptation Lab tests the application of ecological engineering techniques for coastal resilience and restoration. We develop novel methods for shoreline protection using a diversity of restored or created coastal habitats (e.g., mangroves, saltmarsh, seagrass, kelp and shellfish reefs).

- Climate change adaptation
- Ecological engineering
- Sustainable development
- Coastal resilience

Potential Projects:

- Living revetments for enhancing urban biodiversity
- Multi-functional artificial reefs (with City of Greater Geelong and Reef Design Lab)
- Where do shellfish like to live?
- Spatial prioritisation of nature-based coastal defence under climate change (with Dr Rebecca Runting, School of Geography)
- Multi-functional aquaculture: wave attenuation of shellfish farms (a joint NCCC and SALTT project)



Email:

rebecca.morris@unimelb.edu.au

Website:

<http://www.rebeccalmorris.com>

Google Scholar:

<https://scholar.google.com/citations?user=iQjkyEwAAAAJ&hl=en>

Dr John Morrongiello - Marine and freshwater ecology

[Back to top](#) | [Conservation and Climate Change](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

We are a group of ecologists and evolutionary biologists working in marine and freshwater systems investigating how animals respond to environmental change on contemporary and evolutionary time scales. We are keenly interested in the impacts of, and adaptations to, fishery activity, natural and human-induced flow variability, and environmental change. We ask questions at different levels of biological organisation, ranging from individuals (e.g. growth and behaviour) to assemblages (e.g. diversity and fishery productivity), using field-based and experimental techniques.

- Climate change impact and adaptation
- Evolutionary and behavioural ecology
- Sustainable fisheries
- River regulation and habitat restoration
- Life histories

Potential Projects:

- Impacts of marine heatwaves on fisheries productivity (with Dr Emily Fobert, Dr Andy Halford and Dr Jed Macdonald, Pacific Community)
- Fishing and climate change impacts on fish growth (with Dr Emily Fobert)
- Connectivity, demography and stock size of Victorian pipis
- Exploring how river flow affects the diet and growth of native fish (with Dr Zeb Tonkin and Dr Wayne Koster, Arthur Rylah Institute)



Email:
john.morrongiello@unimelb.edu.au

Website:
<http://morrongiellolab.com>

Google Scholar:
<https://scholar.google.com/citations?user=a6mWvB4AAAAJ&hl=en&oi=ao>

Prof. Raoul Mulder - Behavioural ecology

[Back to top](#) | [Evolution and Behaviour](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Animal behaviour

- Social behaviour
- Mating systems
- Sexual selection
- Cooperation
- Communication anthropogenic impacts

Potential Projects:

- Ecology and evolution of animal personalities
- Impacts of anthropogenic noise and light on sleep and communication
- Movement ecology of urban wildlife



Email:

r.mulder@unimelb.edu.au

Website:

<https://raoulmulder.org/>

Google Scholar:

https://scholar.google.com/citations?user=Y_gfg0MAAAAJ&hl=en&oi=ao

Dr Michael Murray - Developmental genetics of Drosophila

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Developmental and Cellular Genetics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

My lab studies the genetic regulation of morphogenesis with a focus on epithelial plasticity: the ability of cells to change from stationary epithelial cells to migratory cells and back again. These mechanisms play crucial roles during development, cancer and wound-healing.

- Genetic regulation of epithelial-mesenchymal plasticity (EMT/MET) during Drosophila development
- molecular mechanisms of epithelial polarisation in Drosophila and mammalian cells
- Netrins and wound healing
- Modelling cancer metastasis in the fly
- Hox gene regulation of epithelial morphogenesis.

Potential Projects:

- How is netrin upregulated in response to wounding?
- The role of wound-healing pathways in epithelial homeostasis



Email:

murraym@unimelb.edu.au

Website:

<https://murraylab.biosciences.uom.org.au/>

Google Scholar:

[https://scholar.google.com.au/citations?
user=YGINzAAAAAJ&hl=en](https://scholar.google.com.au/citations?user=YGINzAAAAAJ&hl=en)

A/Prof. Ed Newbigin - Pollen biology

[Back to top](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Plant cell wall synthesis
- Plant breeding systems
- Self-incompatibility

Potential Projects:

- Cell wall synthesis in pollen tubes
- Self-incompatibility in wild radish



Email:
edwardjn@unimelb.edu.au

Google Scholar:
https://scholar.google.com.au/citations?hl=en&user=AFF74YkAAAAJ&view_op=list_works&gmla=AJsN-F4UM_NifC08n5YoHbfjIVAwCpBB9x4HcGpK6epuea3-aFP9UaOsogQwQ0LtxWQbYmc_mXz0P3mPy4FXsJmaV013Lhb2QwQJw_sYv0zbNFusXhZUKZd3RyTrU9g0uVbPeDxtOF8X

Dr Allyson O'Brien - Marine pollution, ecology, and environmental management

[Back to top](#) | [Marine Biology](#) | [Pollution Impact and Management](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Multiple stressors in urban estuaries
- Marine pollution
- eDNA metabarcoding
- Citizen science

Potential Projects:

- Ecological impacts of microplastics in Port Phillip Bay. This project will involve collecting field data on microplastics fibres and conducting laboratory experiments to test if they accumulate in fish and invertebrates. (with Anthony Boxshall and Mick Keough)
- Multiple stressor impacts caused by built infrastructure. Field and laboratory work investigating interactive effects of stressors caused by built infrastructure including toxicants, artificial light, and habitat complexity (with Rebecca Morris)



Email:
allyson@unimelb.edu.au

Website:
<https://allysonobrien.com/>

Prof. Andrew Pask - Evolution, development and reproduction

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

The Pask Lab researches a variety of topics encompassing evolution, development and reproduction using cutting-edge genome wide approaches, genetic engineering, developmental manipulations, morphometric and computational analyses across a range of human, mouse and marsupial models.

- Urogenital development
- Marsupial genomics
- Genome evolution and function
- Endocrine disruption
- Bioinformatics, Epigenetics, Developmental biology

Potential Projects:

- Effects of endocrine disruption on health and development
- Marsupial conservation biology and genomics
- Defining the causes of declining male reproductive health
- Developmental biology of marsupials



Email:
a.pask@unimelb.edu.au

Website:
<https://blogs.unimelb.edu.au/pasklab/>

Google Scholar:
<https://scholar.google.com.au/citations?user=4ONkuEsAAAAJ&hl=en>

Dr Trent Perry - Insecticide biology, neurogenetics, parasitic biology of the blowfly

[Back to top](#) | [Biotechnology and Translational Research](#) | [Developmental and Cellular Genetics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

The focus of our research is to understand, safeguard and improve insect control strategies. Using both model and pest insects, we apply a mixture of genetics, 'omics' and molecular techniques such as CRISPR to interrogate the impacts of insecticides, how insects adapt to their use and to identify genes that could lead to the development of novel insect control strategies;

- **Insecticide biology**
- determining how insecticides work, what the responses of insects are to acute and chronic exposures and how insects might become resistant
- **Neurogenetics**
- examining nicotinic acetylcholine receptor assembly and trafficking, how specific mutations impact receptor function and the role of these receptors in insect behaviour and development
- **Parasitic biology of the Australian sheep blowfly, *Lucilia cuprina***
- understanding how flies detect their hosts, establish myiasis (flystrike) and evade host responses.

Potential Projects:

- Genetic analysis of the brain circuits that insecticides act upon to kill insects
- Characterising the role nicotinic acetylcholine receptors play in insect behaviour and development
- Understanding odour detection and its involvement in host-seeking behaviour of the Australian sheep blowfly, *Lucilia cuprina*;
- Investigating the potential for a native fungal species to control Australian sheep blowfly (with Dr Alexander Idnurm)
- Identifying genes that are critical for parasitic life stages of the Australian sheep blowfly, *Lucilia cuprina*;



Email:
trentp@unimelb.edu.au

Website:
<https://perrylab.science.unimelb.edu.au/>

Google Scholar:
<http://scholar.google.com.au/citations?user=fDTaKtQAAAAJ&hl=en>

A/Prof Suzie Reichman - Pollution impact and management

Research Interests:

Our interdisciplinary research concentrates on the impacts and management of pollution with an emphasis on the terrestrial environment and soil contamination. Our research focuses on using ecotoxicology, environmental chemistry (especially soil chemistry) and environmental risk assessment. We include research on plants, invertebrates, vertebrates and human health, with our research spanning traditional pollutants (e.g. metals, nitrogen and hydrocarbons) as well as emerging contaminants such as per- and poly-fluoroalkyl substances (PFAS) and microplastics. Our research provides evidence-based outcomes that are used by government, industry and the community to make decisions and more safely manage polluted environments.

- Pollution
- ecotoxicology
- soil chemistry
- land contamination
- risk assessment
- environmental chemistry
- plant biology
- invertebrates
- vertebrates
- urban
- ecology
- human health
- terrestrial

Potential Projects:

- Effects of multistressors (light and metals) on tardigrade survival and reproduction (with A/Prof Theresa Jones)
- Using indigenous terrestrial micro-invertebrates to assess environmental impacts of soil pollution in Antarctica (with the Australian Antarctic Division)
- Is there evidence of arsenic pollution from historic gold mining in the macropods of Melbourne's urban fringe? (with Dr Clare Death)
- Do heavy metals in Victorian bat guano differ with urbanisation or background levels? (with Dr Clare Death and Dr Steve Griffiths (La Trobe University))
- Population-level effects of microplastics on marine invertebrates in Port Phillip Bay. (with Dr Allyson O'Brien)



Email:

suzie.reichman@unimelb.edu.au

Website:

<https://findanexpert.unimelb.edu.au/profile/28291-suzie-reichman>

Google Scholar:

<https://scholar.google.com.au/citations?user=55MjjX4AAAAJ&hl=en>

Prof. Marilyn Renfree - Reproductive and developmental biology

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Developmental and Cellular Genetics](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

Our group studies reproduction and development in health and disease using marsupials and monotremes as biomedical models.

- Reproductive biology of marsupials and monotremes
- Developmental biology
- Sex determination
- Sexual differentiation
- Endocrine disruption
- Epigenetics
- Genomic imprinting
- Embryonic diapause
- Lactation and growth
- Limb development
- Innate immunity
- Comparative genomics.

Potential Projects:

- nan
- Regulatory mechanisms of testicular and ovarian development and the role of long non-coding RNAs
- Gene and hormonal control of gonadal and phallus differentiation and effects of environmental endocrine disruptors
- Marsupials as models for disorders of sexual development including sex reversal and hypospadias
- Early embryonic and post-natal development of the echidna
- Genomic imprinting and epigenetic control of germ cell reprogramming during early development



Email:

m.renfree@unimelb.edu.au

Website:

<http://renfreeshawlab.biosciences.uom.org.au/>

Google Scholar:

<https://scholar.google.com/citations?user=9XQhOZsAAAAJ&hl=en&oi=sra>

Dr Charles Robin - Insect population genetics and molecular evolution

[Back to top](#) | [Population and Quantitative Genetics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

What is the role of adaptation in the shaping variation within and between species? We focus on insecticide resistance as our microevolutionary model, and the comparative genomics of enzymes from various insects in inter-species comparisons. Our applied aim is to control pests with methods that do not have adverse impacts on biodiversity eg. gene drives, RNAi or specific enzyme inhibitors

Potential Projects:

- Gene drives for insect control
- Characterizing potential targets for novel insecticides
- Pest insect genomics, population genetics and genetic manipulation
- Genome wide associations with novel insecticides
- Biotechnology applications of insect enzymes



Email:
crobin@unimelb.edu.au

Website:
<https://www.specifly.org>

Google Scholar:
<https://scholar.google.com/citations?user=Yqh00ToAAAAJ&hl=en&oi=ao>

Dr Nick Robinson - Aquaculture breeding and genetics

[Back to top](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Design of genetic improvement programs
- Gene mapping
- Genomics
- Epigenetics
- Genomic selection
- Stress
- Disease resistance

Potential Projects:

- Nutritional programming to steer the development of Atlantic salmon fillet quality



Email:
fletcher.warren@unimelb.edu.au

- Mapping genes affecting disease and stress resistance in fish and shellfish
- Genomic selection to improve the disease resistance of fish and shellfish
- Development of integrated aquaculture in Africa

Google Scholar:
<https://scholar.google.com/citations?user=N-a3xX8AAAAJ&hl=en&oi=sra>

Prof. Ute Roessner - Abiotic stress adaptation and tolerance

[Back to top](#) | [Biotechnology and Translational Research](#) | [Plant Biology](#) | [Pollution Impact and Management](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Cereal crops
- Functional genomics
- Metabolomics
- Analytical biochemistry
- Root functions
- Water use efficiency
- Nutrient use efficiency

Potential Projects:

- Define the molecular basis of Root-Soil-Microbe interactions
- Define the biochemical basis of signalling networks between roots and shoots
- MIDYEAR.

Can biostimulants be used to enhance the root development of horticulture crops for improved nutrient use and product quality?

Plant root systems control the resources supplied to shoots and harvested products. This project will test if novel biostimulants directly change the fine root architecture of hemp, such that nutrient use efficiency and shoot biomass and quality are improved. Two growth systems will be combined with non-invasive root imaging and ion uptake measurements to provide proof of value of novel biostimulants for sustainable horticulture production.



Email:
u.roessner@unimelb.edu.au

Website:
<https://roessnerlab.science.unimelb.edu.au/>

Google Scholar:
<http://scholar.google.com.au/citations?user=aTmdqpYAAAAJ&hl=en>

Dr Karen Rowe - Ecology and conservation using museum collections and acoustics

[Back to top](#) | [Evolution and Behaviour](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

Research in my lab covers a range of projects and taxonomic groups (primarily birds) and relies heavily on museum collections, field notes, biodiversity surveys, and fieldwork. Current topics include the use of bioacoustics to improve our understanding of species' distributions in the present as well as how they change over time, threatened species monitoring, and emerging infectious diseases

Potential Projects:

- Acoustic monitoring of vocally-active species
- The influence of anthropogenic noise on singing activity in birds
- The use of soundscapes to quantify species richness in biodiversity hotspots
- Emerging infectious diseases of Indo-Australian birds
- Understanding historical change in the distribution of Victorian threatened species



Email:

karowe@museum.vic.gov.au

Website:

<https://karenmcrowe.weebly.com/>

Google Scholar:

<https://scholar.google.com/citations?user=uwOyaZ8AAAAJ&hl=en>

Dr Kevin Rowe - Integrative mammalogy: taxonomy, evolution, genomics, morphology, conservation biology

[Back to top](#) | [Conservation and Climate Change](#) | [Population and Quantitative Genetics](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

Students in my lab work on a wide range of topics related to the origins, evolution, and conservation of mammalian biodiversity, particularly rodents. Relying on and building museum collections we integrate remote fieldwork, biodiversity surveys, genomics, morphology, ecology, geography, and time series data to address diverse questions. How have species responded to climate change and what are the impacts of bushfires on threatened species? How does biogeography shape the diversification of species? How do genomes and phenotype evolve



across the tree of life? How threatened are species by loss of genetic variation?

- Mammalian evolution
- Biogeography
- Systematics
- Comparative Genomics
- Threatened species conservation and management
- Molecular and integrative species delimitation

Potential Projects:

- Genomic analysis for threatened species management. Project will work with a national consortia using genomic data from threatened rodent species to trial a user friendly online system designed for conservation managers to calculate key genetic parameters for threatened species using genomic data.
- Bushfire impacts on threatened rodent species in Victoria. Several projects involving fieldwork and collaborative data analysis.

Email:

krowe@museum.vic.gov.au

Google Scholar:

<https://scholar.google.com.au/citations?user=Qa4cfi4AAAAJ&hl=en>

Dr Marc Somssich - Plant-Fungal interactions and plant cell walls

[Back to top](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Plant-Fungal interactions
- Plant Cell Walls
- Protein-protein interactions
- Advanced Microscopy
- Plant biotic/abiotic stress

Potential Projects:

- Visualizing plant cell infection by a pathogenic fungus using fluorescent markers and microscopy
- Identifying new cell wall damage signals
- Analyzing protein-protein interactions within protein complexes involved in cell wall synthesis



Email:

marc.somssich@unimelb.edu.au

Website:

<https://cellwallimmunity.science.unimelb.edu.au/>

Dr Darren Southwell - Adaptive management and optimal monitoring of threatened species

[Back to top](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Optimal monitoring
- Adaptive management
- Metapopulations
- Population dynamics
- Structured decision-making
- Ecological modelling

Potential Projects:

- Relationships between predator activity, predator density and Malleefowl breeding activity



Email:

darren.southwell@unimelb.edu.au

Website:

<https://dsouthwellresearch.wordpress.com/>

Dr Perran Stott-Ross - Environmental stress, evolution, entomology and endosymbionts

[Back to top](#) | [Evolution and Behaviour](#) | [Population and Quantitative Genetics](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Integrated management of agricultural pests
- Novel approaches for suppressing arboviral disease vectors

Potential Projects:

- Manipulating bacterial symbionts for agricultural pest control
- Evaluating mosquitoes carrying Wolbachia for disease control



Email:

perran.ross@unimelb.edu.au

Website:

<http://perranross.wordpress.com/>

Google Scholar:

<https://scholar.google.com/citations?user=PT8upQAAAAJ&hl=en>

Prof. Devi Stuart-Fox - Evolutionary ecology

[Back to top](#) | [Evolution and Behaviour](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Behavioural and sensory ecology
- Animal coloration: mechanism, function and evolution
- Macro-ecological patterns of colour diversity

Potential Projects:

- Near-infrared properties and thermoregulation in intertidal molluscs. Co-supervised with Dr Amanda Franklin.
- Mimicry complexes in beetles
- Mechanisms producing iridescent and metallic colours in beetles. Co-supervised with Dr Amanda Franklin.
- Are iridescent colours more likely to be sexual signals in birds? Co-supervised with Dr Iliana Medina.



Email: d.stuart-fox@unimelb.edu.au

Website: <https://devistuartfox.com/>

Google Scholar: <https://scholar.google.com/citations?user=IY72IMEAAAAJ&hl=en&oi=ao>

Dr Michael Stumpf - Theoretical systems biology

[Back to top](#) | [Melbourne Integrative Genomics](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Regulatory and signalling networks
- Multiscale models of biological systems
- Mechanistic models for cellular machines, evolutionary theory and statistical inference

Potential Projects:

- Project on theoretical systems biology



Email:

mstumpf@unimelb.edu.au

Google Scholar:

<https://scholar.google.com/citations?user=zaRea8AAAAAJ&hl=en>

Prof. Steve Swearer - Marine ecology, evolution, and environmental management

[Back to top](#) | [Marine Biology](#) | [Pollution Impact and Management](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

Our group works on the ecology of temperate and tropical reefs, with an emphasis on fish early life history and habitat restoration

- Fish and fisheries ecology
- Eco-evolutionary dynamics
- Aquaculture
- Ecological engineering and habitat restoration
- Ecotoxicology
- Marine and coastal biogeochemistry

Potential Projects:

- Maximizing the benefits of aquatic habitat restoration for animals (with Dr Robin Hale, Arthur Rylah Institute)



Email:

sswearer@unimelb.edu.au

Website:

<https://sswearer.wordpress.com>

- Shellfish reef restoration – informing future restoration efforts and assessing ecosystem services (with Dr Simon Reeves and Mr Simon Branigan, The Nature Conservancy)
- Impacts of culverts on fish movement in streams (with Dr Robin Hale and Dr Matthew Jones, Arthur Rylah Institute)
- Impacts of Artificial Light at Night (ALAN) on temperate reef fishes (with Dr Emily Fobert and Dr John Morrongiello)

Google Scholar:
<https://scholar.google.com/citations?user=JHIX8XAAAAAJ&hl=en&oi=sra>

Dr Gerard Tarulli - Reproductive and developmental biology

[Back to top](#) | [Biomedical Science and Human Biology](#) | [Reproduction and Development](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

My research investigates the role of sex steroid hormones in the development of reproductive organs, in particular the phallus, mammary gland and gonads. I study how cells communicate with one another to execute these complex developmental processes.

- Reproduction and development
- Biomedical models of disease
- Sex determination
- Sexual differentiation
- Molecular and hormonal regulation
- Gonad and phallus
- Germ cells
- Comparative genomics
- Transcriptomics



Email:
gerard.tarulli@unimelb.edu.au

Website:
<http://gerardtarulli.com>

Google Scholar:
<https://scholar.google.com/citations?user=EsPZu7sAAAAAJ&hl=en>

Potential Projects:

- How do sex steroids control phallus development?

Dr Joshua Thia - Population genomics, evolutionary biology, and applied science

[Back to top](#) | [Conservation and Climate Change](#) | [Evolution and Behaviour](#) | [Population and Quantitative Genetics](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

I am broadly interested in genetics and evolutionary biology and how they can be applied to conservation and biosecurity issues. My current work focuses on insecticide resistance as an adaptive trait in agricultural insect and mite pest species. Projects would include such themes as: (1) the molecular basis of adaptive traits, (2) adaptive constraints, (3) the application of molecular tools to inform management of agricultural resources.

- Adaptation
- Agriculture
- Bioinformatics
- Evolutionary ecology
- Genomics
- Insecticide resistance
- Population genetics

Potential Projects:

- Molecular mechanisms and heritability of organophosphate resistance in red-legged earth mites (Hoffmann Lab)
- Population genomics and demographic dynamics of red-legged earth mites (Hoffmann Lab)
- Co-evolution of insects and their endosymbionts to insecticide selection (Hoffmann Lab)
- Costs of insecticide resistance and their effects on the rate on resistance evolution (Hoffmann Lab)



Email: joshua.thia@unimelb.edu.au

Website: <https://j-a-thia.weebly.com/>

Google Scholar: <https://scholar.google.co.nz/citations?user=GJpJ9KcAAAAJ&hl=en>

A/Prof. Paul Umina - Insect ecology and management

[Back to top](#) | [Evolution and Behaviour](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

Our research focuses on sustainable pest control and insecticide resistance. Working closely with industry, we help develop new tools to combat insect pests, preserve biodiversity and improve biosecurity efforts.

- Sustainable agriculture
- Integrated pest management
- Insecticide resistance
- Invasion ecology
- Biocontrol

Potential Projects:

- Investigating the role of knowledge types in pest management decision-making. Often, research projects are not undertaken for a sufficient timeframe to allow for an adequate assessment of project impact by extension professionals. This project will undertake a systematic investigation of extension activity impacts and map effective approaches to creating lasting adoption of farming practices.
- Predicting migration cues in aphids. A range of triggers influence migration in crop aphids, ranging from plant phenology to climatic cues. This project would conduct experiments and collect field observations to improve our capacity to understand and predict aphid flights.
- Understanding the impacts of neonicotinoid insecticides in Australian agriculture. This project could combine field-based trials, laboratory experimentation and economic analysis to understand the true costs of neonicotinoids on soil biology, invertebrate communities and farmer profitability



Email:
pumina@unimelb.edu.au

Website:
<https://blogs.unimelb.edu.au/pearl/paul-umina/>

Google Scholar:
https://scholar.google.com.au/citations?hl=en&user=QRL0bDAAAAAJ&view_op=list_works

Dr Allison Van de Meene - Plant cell biology using high-end microscopy techniques

[Back to top](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Cell walls
- Intracellular trafficking
- Secretion and recycling
- Live cell imaging
- Electron microscopy and tomography

Potential Projects:



Email:

- Using live cell and electron microscopy imaging to investigate trafficking and the cell wall allisonv@unimelb.edu.au
- Understanding heterogeneity in cell walls and extracellular matrices in plants and algae
- Investigation of probes for correlative imaging

Google Scholar:
<https://scholar.google.com.au/citations?user=oRCg5BMAAAAJ&hl=en>

Dr Angela Van de Wouw - Plant pathogen interactions

[Back to top](#) | [Mycology and Plant Pathology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Evolution of plant resistance and pathogen virulence
- Canola (Brassica napus) pathogens

Potential Projects:

- Determining the impact of plant selection on pathogen evolution
- Identification of antifungal drug resistance mechanisms



Email:
apvdw2@unimelb.edu.au

Google Scholar:
<https://scholar.google.com.au/citations?user=zrBziuEAAAAJ&hl=en>

Dr Belinda van Heerwaarden - Climate change adaptation

[Back to top](#) | [Conservation and Climate Change](#) | [Population and Quantitative Genetics](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

My research aims to understand the potential for species to respond adaptively to environmental change and identify factors that underpin climate change resilience and vulnerability

- Evolution
- phenotypic plasticity
- endosymbionts
- species distributions
- heat tolerance
- fertility thermal limits

Potential Projects:

- Exploring the potential for endosymbionts to alter climate change resilience
- Can plasticity increase upper male fertility thermal limits?



Email:
belinda.vanheerwaarden@unimelb.edu.au

Website:
<https://belindavanheerwaarden.com/>

Google Scholar:
<https://scholar.google.com.au/citations?user=NSpECCoAAAAJ&hl=en>

Prof. Madeleine Van Oppen - Marine ecology and evolution

[Back to top](#) | [Marine Biology](#) | [Microbiology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Coral microbial symbiosis
- Climate change adaptation and acclimatisation
- Assisted evolution in reef-building corals/coral reef restoration

Potential Projects:

- Engineering algal symbionts that increase coral climate resilience (experimental evolution, genetic engineering)
- Development of a bacterial probiotic that enhances coral bleaching tolerance



Email:
madeleine.van@unimelb.edu.au

Website:
<https://www.microbial-symbiosis.com/>

Google Scholar:
<https://scholar.google.com.au/citations?user=VTjKnHMAAAAJ&hl=en>

Dr Heroen Verbruggen - Marine genomics and microbiology

[Back to top](#) | [Developmental and Cellular Genetics](#) | [Marine Biology](#) | [Microbiology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Environmental microbiology
- Comparative genomics
- Marine algae
- Bioinformatics
- Evolutionary biology

Potential Projects:

- Evolutionary genomics of algae
- Imaging the internal chemistry of coral bleaching
- Deriving biodiversity knowledge from metagenome data
- Reconstructing the algal Tree of Life
- Integration of diverse data sources to understand speciation and biodiversity



Email:

heroen.verbruggen@unimelb.edu.au

Website:

<http://phycoweb.net>

Google Scholar:

<https://scholar.google.com.au/citations?user=wrySKuIAAAAJ&hl=en&oi=ao>

A/Prof. Peter Vesk - Ecology, conservation and management; plants and vegetation

[Back to top](#) | [Conservation and Climate Change](#) | [Plant Biology](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

I have two streams of research: use of plant functional traits to organise, analyse and model plant species response to environment and disturbance; and applied plant and vegetation ecology for conservation and management. Throughout I use statistical and process models to guide thinking and decisions.

- Plant ecology
- Plant functional traits
- Native vegetation management
- Ecological modelling



Potential Projects:

- Predicting tree species responses to environment and drought with traits
- Trait-based models of Eucalypt species distribution
- Post fire growth in shrubs and relations with traits

Email:

pvesk@unimelb.edu.au

Website:

<https://petervesk.wordpress.com/>

Google Scholar:

<https://scholar.google.com.au/citations?user=CiFFlikAAAAJ&hl=en#>

Dr Robert Walker - Plant, soil and microbe interactions

[Back to top](#) | [Microbiology](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

- Plant-microbe interactions
- Microbial phosphate cycling
- Plant growth promoting rhizobacteria
- Rhizobia-legume interactions
- Geomicrobiology

Potential Projects:

- Development of superior phosphate solubilising plant growth promoting rhizobacteria
- Investigating the role of clay degrading microbes in phosphate solubilisation
- Using mass spectrometry to identify signal molecule exchange between bacteria and plants under phosphate starvation



Email:

walker.r@unimelb.edu.au

Dr Fletcher Warren-Myers - Marine ecology and aquaculture

[Back to top](#) | [Marine Biology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Mass marking techniques for fisheries
- Aquaculture technology

Potential Projects:

- Refining roe production for sea urchin aquaculture



Email:

fletcher.warren@unimelb.edu.au

Prof. Michelle Watt - Plant root system discovery and application to human and environmental challenges

[Back to top](#) | [Microbiology](#) | [Plant Biology](#) | [Molecular, Cellular and Developmental Biology](#)

Research Interests:

My group works in the lab and the field to understand how roots develop and function in dynamic rainfall and climate conditions. We combine imaging, phenotyping and omics methods, and include root interactions with the soil microbiome.

- Water efficiency for agriculture by improving genetics and phenotypes of roots
- engineering root carbon for more effective water use
- imaging and modeling root-water-microorganism spatial-temporal dynamics in model soils
- lab to field proof of concept experiments and collaborations

Potential Projects:

- Enhance root carbon genes (with Dr. Berit Ebert)
- Build more efficient and finer roots with genetics (with Dr. John Golz)
- Discover omics of root systems in real soil and water environments (with Drs. Ute Roessner and Heazlewood)
- Visualise root-symbiont dynamics to optimise shoot growth and water uptake (with Prof. Linda Blackall, Dr. Doug Brumley and Dr. Allison van de Meene)



Email:

watt.m@unimelb.edu.au

Website:

<https://science.unimelb.edu.au/engage/giving-to-science/botany-foundation/impact/professorial-chair>

- Explore root drought mechanisms of Australian native plants (with Dr. Jo Birth and Dr. Allison van de Meene)
 - Options for projects in translating lab results to agriculture in the real world
-

Google Scholar:
<https://scholar.google.de/citations?hl=en&pli=1&user=Ey3pJhoAAAAJ>

Dr Andrew Weeks - Conservation biology

[Back to top](#) | [Population and Quantitative Genetics](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Population genetics
- Ecological genetics
- Host-parasite interactions
- Environmental DNA

Potential Projects:

- Genetic rescue in Victorian eastern barred bandicoots
- Bioinformatics of genetic rescue; detecting signatures of inbreeding, outbreeding and local adaptation in the mountain pygmy possum
- Environmental DNA as a novel method for estimating freshwater biodiversity



Email:
aweeks@unimelb.edu.au

Google Scholar:
<https://scholar.google.com.au/citations?user=CZb8XQAAAAJ&hl=en>

Dr Matt West - Applied ecology and wildlife conservation

[Back to top](#) | [Conservation and Climate Change](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Threatened species conservation and management
- Wildlife population dynamics
- Disease ecology including host-reservoir interactions
- Captive breeding and reintroduction
- Ecological modelling
- Frogs, Fish and Fungus (Chytrid) plus things that fly (birds and bats)

Potential Projects:

- Manipulating environmental and trophic interactions to reduce disease risk for threatened frogs.
- Using sound recorders to understand wildlife (frog and bird) populations. This project is supported by Industry.
- Developing improved (non-invasive) strategies to monitor threatened amphibians during mark-recapture programs.
- How far can frogs hop? Understanding movement and dispersal to inform management of threatened frogs.
- Are freshwater spiny crayfish impacted by amphibian chytrid fungus, and can crayfish facilitate chytrid transmission to frogs?
- Why do frogs produce an odour? This research project may be undertaken with Zoo Industry partners



Email:
matthew.west@unimelb.edu.au

Google Scholar:
https://scholar.google.com/citations?hl=en&user=TAJmKGMAAAAJ&view_op=list_works&sortby=pubdate

Dr Bonnie Wintle - Conservation ecology / CEED

[Back to top](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

- Meta-science ('the science of science')
- Reliability and generalisability of research
- Judgement and decision making
- Expert elicitation
- Environmental science (biosecurity, risk assessment)



- Plant ecology

Potential Projects:

- Surveying researchers' attitudes / understanding / opinions about issues in meta-science (e.g. replicability and generalisability of scientific findings, open science).
 - Systematic review: How variable is evidence to support particular conservation decisions?
-

Email:

bonnie.wintle@unimelb.edu.au

Website:

<https://bonnieresearch.wordpress.com/about/>

Professor Brendan Wintle - Conservation and ecology

[Back to top](#) | [Conservation and Climate Change](#) | [Quantitative and Applied Ecology](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

Potential Projects:

- Recent reports of Bogong moth migration failure have caused major concerns among managers, ecologists and the general public not least because of the important role the moth plays in the diet of the critically endangered mountain pygmy possum. It is also a culturally important species to Indigenous communities throughout the region. This project will help clarify the population status of the moth and its role in possum breeding success, enabling more targeted emergency management strategies of species dependent on the moth in years of moth migration failure.

This project seeks to establish a robust Bogong moth monitoring strategy that will provide accurate estimates of the annual variation in biomass available to possums. The student will test moth survey and population estimation methods in the Victorian Alps. This will help clarify the role of the moth in possum breeding success, enabling more targeted emergency management strategies of species dependent on the moth in years of moth migration failure. The project will require some field work to trial moth monitoring methods at possum breeding sites and other locations in alpine areas.



Email:

brendanw@unimelb.edu.au

Website:

<https://brendanwintle.wordpress.com/about/>

Google Scholar:

<https://findanexpert.unimelb.edu.au/profile/261-brendan-wintle>

Dr Qiong Yang - Insect pest and endosymbionts

[Back to top](#) | [Population and Quantitative Genetics](#) | [Ecology and Evolutionary Biology](#)

Research Interests:

As part of PEARG and AGPIP, I conduct research on the dengue vector mosquito and plant virus vector aphid, in the fields of Wolbachia genome, endosymbionts screening and virus transmission efficiency.

- Integrated management of agricultural pests
- Novel approaches for suppressing arboviral disease vectors

Potential Projects:

- Characterization of endosymbionts in Australian aphids
- Exploring interactions between bacterial symbionts and virus transmission for agricultural pest control
- Monitoring the Wolbachia genome and associated mtDNA variants in *Aedes aegypti* populations



Email:
qiongy@unimelb.edu.au

Website:
<https://blogs.unimelb.edu.au/pearg/qiong-yang/>

Google Scholar:
<https://scholar.google.com/citations?user=Uc2e7wMAAAAJ&hl=zh-CN>