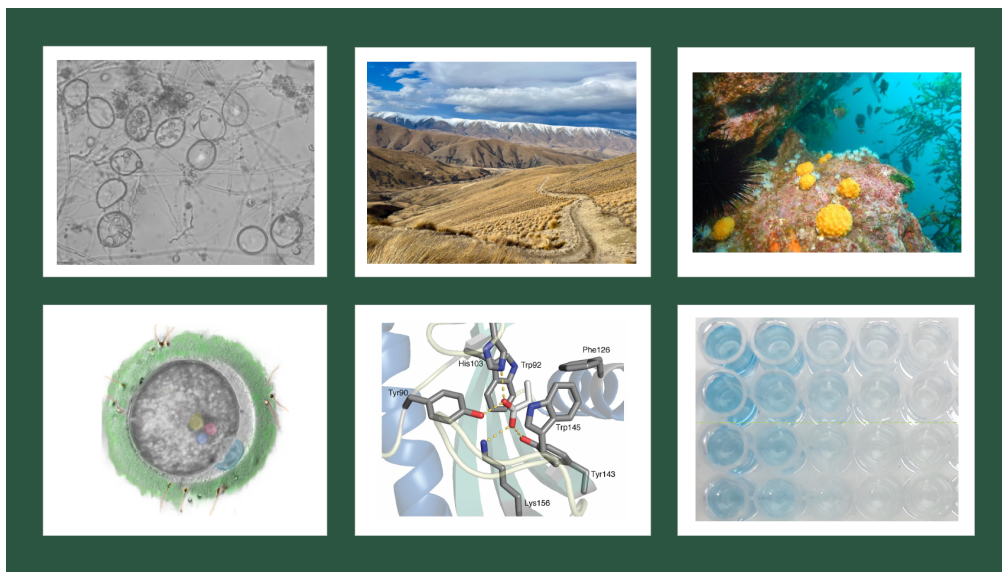


2025 Guide to Postgraduate Programmes in the Biological Sciences



School of Biological Sciences Te Kura Mātauranga Koiora

Website: www.wgtn.ac.nz/sbs

Email: biosci@vuw.ac.nz

Office: Te Toki a Rata Building, Level 2, Kelburn Campus

Phone: 04-463 5339 or 0800 22 77 55

Office Hours: Monday-Friday 8 am- 4 pm

UPDATED OCTOBER 2024

TABLE OF CONTENTS

	Page
Welcome (and who to contact for further advice)	2
Different types of postgraduate qualifications	3-4
Subjects available	5-18
• Biomedical Science	5
• Biotechnology	6
• Cell and Molecular Biology	7
• Clinical Immunology	8
• Clinical Research	9
• Conservation Biology	10-11
• Drug Discovery and Development	12-13
• Ecological Restoration	14
• Ecology and Biodiversity	15
• Marine Biology	16
• Marine Conservation	17
• Molecular Microbiology	18
400-500 Level Course Descriptions	19-30
Indicative Research Projects Available (Listed by Supervisor)	31-45

Welcome!

The School of Biological Sciences offers postgraduate degrees at Honours, Masters, and PhD levels, as well as graduate and postgraduate certificates and diplomas. This guide provides information about the differences between these degrees, the requirements of each, descriptions of our postgraduate courses, and a selection of potential research projects on offer in 2025. We hope this guide is helpful in planning your studies, but if you have any questions, here are some ways to get additional help:

FOR GENERAL INQUIRIES

If you have any general inquiries about your studies, the Tītoko Centre for Student Success is there to assist you. The team is your first point of contact for help with planning the courses necessary to complete your qualification, modifying your current courses or programs, overcoming challenges in your academic progress, connecting you with support services, and addressing various aspects of student life.

Every student at Te Herenga Waka—Victoria University of Wellington gets assigned a personal Student Success Adviser. You can find the name and contact details of your advisor using these instructions: <https://www.wgtn.ac.nz/students/tools-and-help/help-and-advice/your-adviser#find>

Or, if you don't know who your advisor is, you can also drop into the Tītoko office or contact the team by phone or email. Their hours are 9 am – 4 pm, Monday to Friday.

Tītoko Office: CO144, Ground floor, Cotton Building, Kelburn campus

Tītoko Email: info@vuw.ac.nz

Tītoko Phone: 0800 04 04 04 or +64 4 472 1000

FOR QUESTIONS ABOUT SPECIFIC DEGREE PROGRAMMES

If you have questions about one of our postgraduate degree majors, you can also contact one of our programme directors—their contact information is listed below.

Programme	Director name	Contact email
Biomedical Sciences (all majors)	A/Prof Davide Comoletti	Davide.Comoletti@vuw.ac.nz
Biotechnology	Prof David Ackerley	David.Ackerley@vuw.ac.nz
Cell and Molecular Bioscience	A/Prof Bronwyn Kivell	Bronwyn.Kivell@vuw.ac.nz
Clinical Research	Prof Elaine Dennison	Elaine.dennison@vuw.ac.nz
Clinical Immunology	Prof Anne LaFlamme	Anne.Laflamme@vuw.ac.nz
Conservation Biology	Prof James Bell	James.Bell@vuw.ac.nz
Drug Discovery & Development	A/Prof Simon Hinkley	Simon.Hinkley@vuw.ac.nz
Ecology and Biodiversity	Prof Phil Lester	Phil.Lester@vuw.ac.nz
Ecological Restoration	Dr Nicola Day	Nicola.Day@vuw.ac.nz
Marine Biology	Prof James Bell	James.Bell@vuw.ac.nz
Master of Marine Conservation	Prof James Bell	James.Bell@vuw.ac.nz
Molecular Microbiology	Dr Joanna Mackichan	Joanna.Mackichan@vuw.ac.nz

TO FIND A RESEARCH SUPERVISOR

Please email academic staff in your research area of interest; staff email addresses follow the pattern of firstname.lastname@vuw.ac.nz. Some potential projects on offer in 2025 are listed on pages 31-45; however, project availability can change, so reach out to anyone of interest.

DIFFERENT TYPES OF POSTGRADUATE QUALIFICATIONS

The School of Biological Sciences offers postgraduate degrees at Honours, Masters, and PhD levels, as well as graduate and postgraduate certificates and diplomas.

Bachelor of Science (Honours) Degrees

An Honours Degree (Hons) is a chance to deepen your knowledge and skills in a specialist area. It is a prestigious qualification and a good option for students interested in progressing to further, in-depth research, such as a PhD.

The degree is normally completed over two semesters and involves 120 points of study, 30 of which come from your research project and thesis.

After graduating with a BSc (Hons), you are eligible for direct entry to a PhD. It's also possible to progress to a one-year thesis-only Master of Science (MSc) degree.

Prerequisites: (1) An undergraduate degree in the chosen field, with a B+ grade average in relevant 300-level courses. (2) An academic supervisor for your 30-point research project.

We offer BSc (Hons) degrees with majors in Biotechnology, Cell and Molecular Bioscience, Conservation Biology, Ecology and Biodiversity, Marine Biology, and Molecular Microbiology. There is also a specialist Honours programme in Biomedical Science (BBmedSc(Hons)).

Research Masters Degrees

A Research Masters Degree (MSc) allows you to build on your previous study via a mixture of coursework and research. The degree is normally completed over two years (Part 1 and 2). Part 1 involves 90 points of coursework plus 30 points of research preparation. Part 2 is full-time research (120 points). A Research Masters Degree is a good option for students who want to gain significant research experience and build transferrable skills.

Prerequisite: To enter Part 1, you must have an undergraduate degree in the chosen field, with a B+ grade average in relevant 300-level courses. You also must have an academic supervisor for the research component. Entry to Part 2 depends on performance in Part 1 (students with an existing qualification equivalent to Honours may enter directly into Part 2).

The school offers MSc degrees with majors in Biotechnology, Cell and Molecular Bioscience, Conservation Biology, Ecology and Biodiversity, Marine Biology, and Molecular Microbiology, and a specialist Masters programme in Biomedical Science (BBmedSc(MSc))

Taught Masters Degrees

These degrees are normally undertaken over one calendar year and are designed to provide a professional focus in a variety of subject areas, including Master of Clinical Immunology (MClinIm), Master of Conservation Biology (MConBio), Master of Drug Discovery and Development (MDDD), and Master of Marine Conservation (MMarCon).

Prerequisite: An undergraduate degree in the chosen field, with a B+ grade average in relevant 300-level courses.

DIPLOMAS AND CERTIFICATES

We offer a number of diplomas and certificates that allow you to build and expand on your previous education in a particular topic. Options include a Graduate Diploma in Science (GDipSc), Postgraduate Certificates in Science (PGCertSc), Drug Discovery and Development (PGCertDDD) and Marine Conservation (PGCertMarCon), and Postgraduate Diplomas in Science (PGDipSc), Biomedical Science (PGDipBmedSc), Clinical Research (PGDipClinRes) and Drug Discovery and Development (PGDipDDD).

Postgraduate Certificate in Science (PGCertSc)

A Postgraduate Certificate gives students the chance for postgraduate study in a focused area within an achievable timeframe while working full-time or managing other commitments. The PGCertSc can also provide an earlier exit point from an MSc or BSc(Hons) programme.

The PGCertSc:

- one trimester full-time or up to two years part-time.
- usually consists of all coursework (60 points) at the postgraduate level (i.e. 400-level or above).
- usually requires a B grade average in related 300-level subjects for admission.
- is endorsed in a subject offered for the MSc degree.
- can lead to a PGDipSc with 60 further approved points..

Postgraduate Diploma in Science (PGDipSc)

This is a one-year postgraduate programme. The PGDipSc provides an alternative path of postgraduate study for students wanting a coursework postgraduate qualification or for those not admitted to the BSc(Hons) or MSc Part 1 and for those who are not permitted to progress to Part 2 of the MSc but have passed an appropriate 120 points at postgraduate level.

The PGDipSc is:

- one year full-time or up to four years part-time.
- usually consists of all coursework (120 points) at the postgraduate level.
- usually requires a B grade average in related 300-level subjects for admission.
- is endorsed in a subject offered for the MSc degree.
- may permit admission to an MSc by research if achieved at a high academic level.

DOCTOR OF PHILOSOPHY (PHD)

The PhD is the highest degree offered by the School of Biological Sciences. The Faculty of Graduate Research is the initial contact point for all PhD students. Please visit <https://www.wgtn.ac.nz/fgr> for all queries, including available funding, the role of a supervisor and the application process.

BIOMEDICAL SCIENCE

Mātai Koiora Rongoā

Advance your Bachelor's or Honours degree and gain highly developed research skills with postgraduate study in Biomedical Science.

Entry requirements:

- The requirement for acceptance is to have satisfied the requirements of at least one specialisation of the BBmedSc undergraduate degree or equivalent.
- For Honours and Masters, the minimum internal requirement for acceptance is a B+ average (GPA 6.0 or higher) in relevant 300-level courses.
- For Honours and Masters, an academic supervisor is required for the 30-point research project.

BACHELOR OF BIOMEDICAL SCIENCE WITH HONOURS

The degree is normally undertaken over two semesters and involves 90 points worth of courses and a 30-point research project.

Course requirements:

- 30 points chosen from BMSC 401–406; CLNR 413, 414
- 60 further points chosen from BIOL 430-435, BMSC 401–449; CLNR 410, 413, 414
- Research Project (BMSC 489).

RESEARCH MASTERS OF BIOMEDICAL SCIENCE

Part 1 consists of:

- 30 points chosen from BMSC 401–406, CLNR 413, 414
- 60 further points chosen from BIOL 430-435, BMSC 401-499, CLNR 410, 413, 414
- BMSC 580 Research Preparation.

Part 2:

- BMSC 591 (thesis)

Part 2 of a Master's degree in Biomedical Science involves a year of full-time work on a research topic in biomedical science. Students must have completed Part 1 or have the equivalent of a BBmedSc(Hons) degree with research experience before enrolling in the programme. Research areas are listed under individual staff interests, and enrolment is only possible after an academic staff member has agreed to act as the primary supervisor for the student.

POSTGRADUATE DIPLOMA IN BIOMEDICAL SCIENCE

Before enrolment, a candidate shall have completed a BBmedSc degree or equivalent Bachelor's degree. The personal course of study shall consist of 30 points from BMSC 401–406, CLNR 410, 413, 414, and 90 further points from BIOL 430-435, BMSC 401–489, 580, CLNR 410, 413, 414.

BIOTECHNOLOGY

Hangarau Koiora

Get a deeper understanding of its practical applications and use your passion for science to find new ways to help make life better. By studying Biotechnology (BTEC) at the postgraduate level, you'll learn how to use living organisms or components like proteins, enzymes or genes to create or improve commercial products. Explore the business aspects of biotechnology development, get experience in practical research, and develop your skills in designing and performing hands-on experiments.

Entry requirements:

- For Honours and Masters, the minimum internal requirement for acceptance is a B+ average (GPA 6.0 or higher) in relevant 300-level courses.
- For Honours and Masters, an academic supervisor is required for the 30-point research project.
- Required courses: BTEC 301; 35 points from (BIOL 340; BMSC 301-399; CHEM 301-399; SCIE 310).

BIOTECHNOLOGY FOR BSC WITH HONOURS

Course requirements:

- BTEC 489, 435
- 75 points from courses BTEC/BIOL/BMSC/CHEM/CLNR/DRGD/MBIO 401–479
- Substitution of up to two courses from the BSc(Hons) schedule may be made with approval from the Head of School.

BIOTECHNOLOGY RESEARCH MASTERS

Part 1 consists of:

- BTEC 580, BTEC 435
- 75 points from courses BTEC/BIOL/BMSC/CHEM/CLNR/DRGD/MBIO 401–479.

Part 2:

- BTEC 591 (thesis).

BIOTECHNOLOGY POSTGRADUATE DIPLOMA (PGDipSc)

The personal course of study shall consist of 15 points from BTEC 401–479; 105 further points from BTEC/BIOL/BMSC/CHEM/CLNR/DRGD/MBIO 401–479 .

NOTE: Please note that in 2025, BTEC 436 will not be offered. Usually, this course is partnered with BTEC 435 for 30 points; however, for 2025, any other relevant 15-point BIOL, BMSC, MBIO, or CHEM course may be substituted for BTEC436 for a PGDipSc, BSc(Hons), or MSc majoring in Biotechnology.

CELL AND MOLECULAR BIOSCIENCE

Mātauranga Koiora Pūtau

Go deeper into the world of chemistry and biology as you examine life and cellular processes at the molecular level.

Entry requirements:

- For Honours and Masters, the minimum internal requirement for acceptance is a B+ average (GPA 6.0 or higher) in relevant 300-level courses.
- For Honours and Masters, an academic supervisor is required for the 30-point research project.
- Required courses: BIOL 340, BMSC 339, and 40 additional points from BMSC 301 or BIOL/BMSC 329–354.

CELL AND MOLECULAR BIOSCIENCE HONOURS

Course requirements:

- CBIO 489.
- 90 points in an approved combination from BIOL 430–440, BMSC 433.

CELL AND MOLECULAR BIOSCIENCE RESEARCH MASTERS

Part 1 consists of:

- CBIO 580.
- 90 points in an approved combination from BIOL 430–440, BMSC 433.

Part 2:

- CBIO 591 (thesis).

CELL AND MOLECULAR BIOSCIENCE POSTGRADUATE DIPLOMA

The personal course of study for a PGDipSci in Cell and Molecular Bioscience shall consist of 120 points from BIOL 430–440, BMSC 433.

CELL AND MOLECULAR BIOSCIENCE POSTGRADUATE CERTIFICATE

The personal course of study for a PGCertSc in Cell and Molecular Bioscience shall consist of 60 points from BIOL 430–440, BMSC 433/

CLINICAL IMMUNOLOGY

Ārai Mate Whakamātau

Postgraduate study of Clinical Immunology will help you prepare for a career researching and developing new clinical treatments such as vaccines and drug therapies or take your skills into health policy or management. You'll study advanced immunological theory and techniques and train in clinical trial design and practice. During your studies, you'll also develop your oral and written communication skills.

Entry requirements:

- A Bachelor of Biomedical Science (BBmedSc degree) with a major in Molecular Pathology or an equivalent qualification, with a B average (i.e. GPA 5.0 or higher) or better in the relevant coursework.
- Acceptance by the Head of School of Biological Sciences as capable of proceeding with the proposed course of study.

TAUGHT MASTERS OF CLINICAL IMMUNOLOGY

The Master of Clinical Immunology (MClinIm) is a one-year (full-time) taught Master's programme which combines advanced immunological theory, biostatistics, clinical practice and the opportunity to undertake an individual research project in immunology. Students will be equipped with the skills required to assess, analyse, and undertake clinical research in immunology.

While based at Victoria University of Wellington, the programme is delivered by staff from the University, the Malaghan Institute of Medical Research, Capital and Coast District Health Board, and the Medical Research Institute of New Zealand.

Students start in Trimester One. Standard trimester closing dates apply.

Part 1 consists of: CLNR 401, 403, 410, 413, 414; 30 points from CLNR 411, 412 or other approved electives.

Part 2: CLNR 510, 511.

CLINICAL RESEARCH

Rangahau Whakamātau

Study Clinical Research and get the skills you need to carry out evidence-based research that will advance medical knowledge. You'll learn to use both qualitative and quantitative research methods and find out how to critically evaluate current literature. Gain knowledge in good study design and research practice, data analysis and research presentation. You'll learn how to carry out clinical trials and cover ethical and cultural issues in clinical research.

Entry requirements:

- All students must apply to be accepted by the Programme Director.
- Those entering the PGDipClinRes will need to have completed a relevant degree in health, medicine, neuroscience, psychology, biomedical science or biostatistics or equivalent (typically with a B+ average (i.e. GPA 6.0 or higher) in relevant subjects) or demonstrate extensive relevant experience in the field.
- The Master's programme is by thesis only and requires the prior completion of a PGDipClinRes or equivalent. Students with extensive relevant experience directly relevant to the area of their proposed thesis study may also be considered.

POSTGRADUATE DIPLOMA IN CLINICAL RESEARCH (PGDipClinRes)

The Postgraduate Diploma in Clinical Research (PGDipClinRes) is a distance taught diploma. It is ideal for people already working in clinical research or who would like to work in clinical research. It prepares students for undertaking clinical research projects in a professional setting and covers research ethics, statistics, and clinical trial design. The diploma is part of a collaboration with the Capital and Coast District Health Board and other medical organisations in the Wellington area, and the teaching staff includes clinicians.

It is offered part-time and can be completed in up to four years. It consists of all coursework (120 points). Students must have a relevant bachelor's degree and/or professional experience for admission.

Course requirements:

- CLNR 401, 402, 403, 404, 405, 580.

MASTERS OF CLINICAL RESEARCH (MCLinRes)

The Master of Clinical Research (MCLinRes) is a Master's by thesis rather than a taught Master's. Many applicants may choose to undertake this part-time at their place of residence, allowing them to continue work commitments. However, it is important that a potential project and local supervisor have been identified if this route is pursued. An applicant who wishes to relocate to Wellington is invited to discuss potential research projects with the Programme Director. The MCLinRes can, in many cases, lead to opportunities to undertake a PhD in clinical research.

Course requirements

- CLNR 591 (thesis).

CONSERVATION BIOLOGY

Mātai Koiora Whāomomo

The increasing human impact on the environment, loss of biodiversity, and growing awareness of climate change underscore the importance of conservation biology. The Master of Conservation Biology is a one-year, 180-point professional program that combines conservation, ecology, biodiversity, and sustainability. This course equips you with the scientific expertise needed for conservation work in New Zealand and globally. Studying at the School of Biological Sciences in Wellington, an international biodiversity hotspot, you'll learn from world-leading conservation scientists whose work influences the management of New Zealand's unique ecosystems. The program employs theoretical and field-based approaches across various terrestrial and marine environments. You'll study conservation biology processes, examine best practices, and develop skills in experimental design, data collection and analysis, and research presentation. Graduates will be prepared to make significant contributions to environmental conservation efforts worldwide.

Entry requirements:

- The minimum internal requirement for acceptance is a B+ average (i.e. GPA 6.0 or higher) in relevant 300-level courses.
- 60 points in approved BIOL courses numbered 300-399, STAT 193 or equivalent.

CONSERVATION BIOLOGY BSC WITH HONOURS

Course requirements:

BIOL 420.

- 60 points in an approved combination from BIOL 403, 404, 421–424
- Research project (CONB 489)

With permission of the Head of School an approved course may be substituted for one of BIOL 401–440, 510–530, ERES 525–527.

CONSERVATION BIOLOGY POSTGRADUATE DIPLOMA (PGDipSc)

Course requirements:

- BIOL 420.
- 90 points in an approved combination from BIOL 401–440, 519, ERES 525–527 or other approved courses.

TAUGHT MASTERS OF CONSERVATION BIOLOGY

The Master of Conservation Biology (MConBio) programme is a professional one-year Master's degree that draws on scientific expertise and its application to conservation throughout New Zealand. The programme is 180 points of study, including three core courses and 90 points of electives within an

approved programme of study.

The January/February start to the programme begins with a four-week field course, *New Zealand Conservation Practice* (BIOL 424). Upon returning to Wellington, students conduct critical analyses of key management issues and take two seminar-style courses: *Conservation Ecology* (BIOL 420) and an approved elective. The July start to the programme includes *Invasive Species, Biosecurity and the Law* (BIOL 425) and two approved electives. There is potential to include an international postgraduate exchange. There is no thesis component to the MConBio.

Entry requirements:

A Bachelor's degree in a biological or other relevant discipline with a B+ average (i.e. GPA 6.0 or higher) in relevant 300-level courses or approval of the Associate Dean - Academic (Postgraduate).

Course requirements:

BIOL 405, 420, 424 and 90 points in an approved combination from BIOL 401–440, 510–530, ENVI 525, ERES 525–527 or other courses approved by the Head of School.

Application deadline: October 15th in the year prior for studies starting in January, and normal university enrolment dates for a July start.

DRUG DISCOVERY AND DEVELOPMENT

Research in drug discovery and development enables the identification of new drug targets and therapeutics. Postgraduate programmes in Drug Discovery and Development are offered in collaboration with the Centre for Biodiscovery, the Ferrier Research Institute, and the Schools of Biological Sciences and Chemical and Physical Sciences.

These programmes (Postgraduate Certificate, Postgraduate Diploma and Master's) operate on the interface between the fields of chemistry and biological sciences, drawing on the research expertise of the Ferrier Research Institute in drug design and development and on expertise from the Centre for Biodiscovery in the discovery and design of bioactive compounds and the determination of their modes of action.

Students will be provided with a programme of study tailored to their personal skills and interests, with flexibility being offered by the opportunity to undertake directed individual study courses. It uses a mix of academic and practical skills. It is closely aligned to the needs of the pharmaceutical industry in the areas of drug design and development, including bioanalytical, chemical and related industries, nutraceuticals and agrichemicals.

For more information see <https://www.wgtn.ac.nz/explore/postgraduate-programmes/master-of-drug-discovery-and-development/overview> or contact A/Prof Simon Hinkley, Programme Director via email at simon.hinkley@vuw.ac.nz or phone +640-4-463 0065.

Entry requirements: A Bachelor's degree in a biological or other relevant discipline or approval of the Associate Dean Academic (Postgraduate).

POSTGRADUATE CERTIFICATE (PGCertSc) IN DRUG DISCOVERY AND DEVELOPMENT

The personal course of study shall consist of 60 points, including:

- DRDG 401; one of CHEM 421, DRDG 402
- a further 30 points from BIOL 430-440, BMSC 400-441, BTEC 435-441, CHEM 400-441,
- CLNR 401-405, DRGD 402-403, MBIO 434-440

POSTGRADUATE DIPLOMA (PGDipSc) IN DRUG DISCOVERY AND DEVELOPMENT

The personal course of study shall consist of 120 points, including:

- DRDG 401; one of CHEM 421, DRDG 402
- a further 60 points from BIOL 430-440, BMSC 400-441, BTEC 435-441, CHEM 400-441,
- CLNR 401-405, DRGD 402-403, MBIO 434-440
- DRDG 580.

TAUGHT MASTERS OF DRUG DISCOVERY AND DEVELOPMENT

The Master of Drug Discovery and Development (MDDD) is a one-year (full-time) 180-point Master's programme that includes a 60-point research project.

Part 1 consists of:

- DRDG 401; one of CHEM 421, DRDG 402
- a further 60 points from BIOL 430-440, BMSC 400-441, BTEC 435-441, CHEM 400-441,
- CLNR 401-405, DRGD 402-403, MBIO 434-440
- DRDG 580

Part 2:

- DRGD 561 or 590

The MDDD may be endorsed with one of the following specialisations:

Drug Development: DRGD 401, 402 and 403.

Drug Discovery: DRGD 401; one of DRGD 402 or CHEM 421; 15 further points from DRGD 402, CHEM 421, BMSC 432, BTEC 435, MBIO 401.

Chemical Biology: DRGD 401, CHEM 421; 15 further points from BMSC 405, 430–433, CHEM 424–425.

A thesis option is available for suitably qualified students. With permission from the programme director, students may replace DRGD 580 or 590 with DRGD 595 (Research Thesis).

ECOLOGICAL RESTORATION

Whakaora Mātai Hauropi

By majoring in Ecological Restoration (ERES), you'll develop an understanding of ecological restoration and its biological and human dimensions.

Entry requirements:

- The minimum internal requirement for acceptance for both MSc and PGDipSc is a B+ average (i.e. GPA 6.0 or higher) in relevant 300-level courses.
- 60 points in approved BIOL courses numbered 300-399 and STAT 193 or equivalent.

ECOLOGICAL RESTORATION FOR RESEARCH MASTERS

The Master of Science in Ecological Restoration is a two-year programme. Part 1 consists of two compulsory courses (ERES 525 and 580) and two other approved courses. Part 2 consists of a research thesis (ERES 591).

Part 1 consists of:

- ERES 525, 526, 580.
- 30 points in an approved combination from BIOL 403, 404, 421–440, 519, ENVI 503–529 or other courses approved by the Head of School.

Part 2:

- ERES 591 (thesis).

ECOLOGICAL RESTORATION POSTGRADUATE DIPLOMA (PGDipSc)

Course requirements:

- ERES 525, 526.
- 60 points in an approved combination from BIOL 403, 404, 421–440, ENVI 503–508 or other courses approved by the Head of School.

ECOLOGY AND BIODIVERSITY

Mātai Hauropi, ngā Momo Koiora hoki

Enhance your career prospects and increase your knowledge with postgraduate study of ecology and biodiversity (EBIO).

Entry requirements:

- For Honours and Masters, the minimum internal requirement for acceptance is a B+ average (GPA 6.0 or higher) in relevant 300-level courses.
- For Honours and Masters, an academic supervisor is required for the 30-point research project.

ECOLOGY AND BIODIVERSITY BSC HONOURS

Required courses:

- EBIO 489, BIOL 422.
- 60 further points from BIOL 401-424, 440, 519, ERES 525-527.

With permission of the Head of School, one of BIOL 427, 428, 430 may be substituted for one course from the second bullet point above.

ECOLOGY AND BIODIVERSITY RESEARCH MASTERS

Part 1 consists of:

- BIOL 422, 580
- 60 further points from BIOL 401–424, 440, 519, ERES 525–527.

Part 2:

- EBIO 591 (thesis)

ECOLOGY AND BIODIVERSITY POSTGRADUATE DIPLOMA (PGDipSc)

BIOL 422; 90 points from BIOL 401–424, 440, 519, ERES 525–527.

MARINE BIOLOGY

Mātai Koiora Moana

Enhance your degree and gain an in-depth understanding of the complex world of Marine Biology, from windswept coasts and sandy beaches to coral reefs and the depths of the ocean. By studying Marine Biology (BMAR) at the postgraduate level, you'll develop practical skills in research design, implementation, and analysis, as well as engage in discussion and critical evaluation of current issues in marine biology.

Entry requirements:

- 60 points in approved BIOL courses numbered 300-399, STAT 193 or equivalent.
- The minimum internal requirement for acceptance is a B+ average (i.e. GPA 6.0 or higher) in relevant 300-level courses.
- For Honours and Masters, an academic supervisor is required for the 30-point research project.

MARINE BIOLOGY BSC HONOURS

Course requirements:

- BIOL 423, BMAR 489
- 60 points from (BIOL 403 to 526)

Specialisation: You may obtain a specialisation in Fisheries Science by including BIOL 410 Fisheries Science, and approval from the Head of School that BMAR 489 focuses on the area of fisheries science.

MARINE BIOLOGY RESEARCH MASTERS

Part 1 consists of:

- BIOL 423, 580
- 60 points from BIOL 401–440, 519, ERES 525–527 or other approved courses

Part 2:

- BMAR 591 (thesis)

Specialisation: You may obtain a specialisation in Fisheries Science by including BIOL 410 Fisheries Science, and approval from the Head of School that BMAR 591 focuses on the area of fisheries science.

MARINE BIOLOGY POSTGRADUATE DIPLOMA (PGDipSc)

Course requirements:

BIOL 423 and 90 points from BIOL 401–440, 519, ERES 525–527 or other approved courses

MARINE CONSERVATION

He Takimoana

Learn how to make a difference to coastal and marine environments in New Zealand, the Pacific, and around the world with a postgraduate degree in Marine Conservation

Entry requirements:

- 60 points in approved BIOL courses numbered 300-399, STAT 193 or equivalent.
- The minimum internal requirement for acceptance is a B+ average (i.e. GPA 6.0 or higher) in relevant 300-level courses.

TAUGHT MASTERS OF MARINE CONSERVATION

The Master of Marine Conservation (MMarCon) is a 12-month, 180-point taught professional degree, which can be started in either January or June.

Part 1 (January-June) consists of:

- BIOL 424
- 60 further points from the MMarCon Schedule (e.g., BIOL 405, 416, 417, 420, 422, 423, 436, ERES 526, ENVI 525, MAOR 411)

Part 2 (June-December):

- BIOL 519 and 529,
- 30 further points from the MMarCon Schedule (e.g., BIOL 403, 410, 440, BMAR 580, ERES 526, ENVI 506, MAOR 409, PASI 402–403)

The programme's Trimester 1 start begins with a four-week field course in January/February, *New Zealand Conservation Practice* (BIOL 424). Upon returning to Wellington, students conduct critical analyses of key management issues and take two seminar-style courses.

Application deadline: October 15 in the year prior for studies starting in Trimester 1 and March 1 for studies starting in Trimester 2.

POSTGRADUATE CERTIFICATE IN MARINE CONSERVATION

The 90-point certificate consists of courses chosen from the Master of Marine Conservation schedule and includes at least one of BIOL 424, 519, or 529. It is usually completed in six months (full-time) or twelve months (part-time).

MOLECULAR MICROBIOLOGY

Mātai Koiora Pūtau

Molecular microbiology combines the power of molecular biology techniques with the study of microorganisms, providing unique insights into the fundamental processes of life. By studying microbes at the molecular level, you can begin to unravel the mysteries of how these tiny organisms function, evolve and interact with their environment. This exciting and rapidly evolving field has profound implications for human health, the environment, and biotechnology.

Entry requirements:

- The minimum internal requirement for acceptance is a B+ average (i.e. GPA 6.0 or higher) in relevant 300-level courses.
- BMSC 301 (Medical Microbiology), BIOL 340 (Genes & Genomes).
- 20 further points from either BIOL 236 (Microbes & their Environments), BMSC 334 (Cell & Immunobiology), or BTEC 301 (Biotechnological Techniques and Processes).

MOLECULAR MICROBIOLOGY BSC HONOURS

Required courses:

- BIOL 430, MBIO 434, MBIO 489.
- 30 points from (BIOL 400–429, 431–439, MBIO 440).

Up to two courses may be substituted with prior approval from the Programme Director (Dr Joanna Mackichan, email: Joanna.Mackichan@vuw.ac.nz).

MOLECULAR MICROBIOLOGY RESEARCH MASTERS

Part 1 required courses:

- BIOL 430, MBIO 434, MBIO 580.
- 30 points from BIOL 400–429, 431–439, MBIO 440.

Up to two courses may be substituted with prior approval from the Programme Director (Dr Joanna Mackichan, email: Joanna.Mackichan@vuw.ac.nz).

Part 2 required courses:

- MBIO 591 (thesis)

400 – 500 LEVEL COURSE DESCRIPTIONS

These are the planned courses for 2025. However, the university may cancel courses due to insufficient resources, student demand, or other unforeseen circumstances.

Check online for up-to-date information, as well as more detailed course information (e.g. syllabus, timetable): <https://www.wgtn.ac.nz/study/programmes-courses/courses>

HOW TO USE THIS GUIDE

BIOL 123	CRN 000	BIOLOGY COURSE XYZ	30 PTS	TRI X
-----------------	----------------	---------------------------	---------------	--------------

COURSES

BIOL 403	CRN 588	EVOLUTIONARY ANALYSIS	30 PTS	TRI 2
Prerequisites:		BIOL 329 or approval of the Head of School		
Coordinator:		Dr Peter Ritchie		

This course focuses on classic questions in evolution including speciation processes, reconstruction of biological history from modern specimens, macroevolution, the origin(s) of complexity, and human evolution. Special emphasis is given to the impact of data produced by modern molecular techniques, including DNA sequences.

BIOL 405	CRN 29141	PEST MANAGEMENT, BIOSECURITY AND LAW	30 PTS	TRI 2
Restrictions:		BIOL 425 prior to 2017		
Coordinator:		Prof Phil Lester		

Legal and biological perspectives on pest management, invasive species and biosecurity. The course examines national and international law regulating pest management and biosecurity including key international agreements and related dispute settlement processes. It explores issues in domestic and international biosecurity management and includes recent case studies and Māori perspectives on biodiversity and biosecurity.

BIOL 410	CRN 27047	FISHERIES SCIENCE	30 PTS	TRI 1
Prerequisite:		30 pts of relevant statistics at 200-level or above or permission of Head of School		
Coordinator:		Dr Alice Rogers		

Underlying principles and techniques used in fisheries science. Topics include population responses to exploitation, collection of fish biology and fishery data, statistical data analysis and population models, and the application of science in resource management. The course is interdisciplinary, with a focus on putting theory into practice.

BIOL 420	CRN 5036	CONSERVATION ECOLOGY	30 PTS	TRI 1
Prerequisite:	300-level Ecology or approval of the Head of School			
Coordinator:	Prof Heiko Wittmer			

BIOL 420 is a course that focuses on the unprecedented loss of biodiversity caused by human activities and provides an overview of the wider context of 'Conservation Biology'. It first defines the academic discipline of 'Conservation Biology' followed by an examination of the most common causes of the observed declines and extinctions of species (i.e., the ecology of extinction). It then proceeds to provide students with tools to help develop and implement effective conservation strategies aimed at protecting species at risk of extinction.

BIOL 422	CRN 9586	ECOLOGY	30 PTS	TRI 1
Prerequisite:	300-level Ecology or permission of the Head of School			
Coordinator:	TDB			

In this course we will critically evaluate current and past concepts in ecology. To do this, we will examine how foundational ecological ideas/concepts have originated and changed over time, and obtain an appreciation for some of the innovative approaches that researchers today are applying to address long-standing (i.e., "classic") ideas/questions in ecology. We integrate material across a variety of disciplines and systems.

BIOL 423	CRN 9587	MARINE BIODIVERSITY AND ECOLOGY	30 PTS	TRI 1
Coordinator:	Prof James Bell			

Selected current research topics in Marine Biology, including marine ecology, diversity and conservation.

BIOL 424	CRN 9629	NEW ZEALAND CONSERVATION PRACTICE	30 PTS	
Prerequisite:	300-level Ecology or the approval of the Head of School			
Coordinator:	Prof Heiko Wittmer <i>(non-standard dates - does not conform to standard trimester dates)</i>			

Applications close 15 October for enrolment in this course. Notify Prof Heiko Wittmer as early as possible if you are interested in taking this course.

BIOL424 is a practical, field-based course in New Zealand's fauna and flora and their conservation. Students visit a range of important field sites to learn about major conservation problems affecting the New Zealand biota. A case study approach is used to examine the conservation practices of New Zealand conservation scientists and managers. October 15 is the deadline for applications to take the course. The fieldwork is of 4 weeks duration, commencing in late January through to late February. Assessment of the practical work continues until the end of April. This course is primarily available to students enrolled on the Master of Marine Conservation or Master of Conservation Biology programmes.

BIOL 430	CRN 9228	GENETICS AND MOLECULAR BIOLOGY	30 PTS	TRI 2
-----------------	-----------------	---------------------------------------	---------------	--------------

Prerequisite: 45 points from approved combination of 300-level BIOL, BMSC, CHEM, PSYC courses or permission of Head of School
 Coordinators: Dr Melanie McConnell

An in-depth review of research and modern concepts in heredity, genomics, gene regulation and molecular microbiology.

BIOL 431	CRN 9229	CELL BIOLOGY	30 PTS	TRI 2
-----------------	-----------------	---------------------	---------------	--------------

Prerequisite: 45 points from approved combination of 300-level BIOL, BMSC, CHEM, PSYC courses or permission of Head of School
 Approved courses: Approved courses to include at least 20 points from BIOL 340, BMSC 343. All 45 points to be achieved at B grade or above.
 Coordinators: A/Prof Bronwyn Kivell

Advances in cellular structure, function, and behaviour, including aspects of developmental biology.

BIOL 432	CRN 9230	PHYSIOLOGY AND PHARMACOLOGY	30 PTS	TRI 1
-----------------	-----------------	------------------------------------	---------------	--------------

Prerequisite: 45 points from approved combination of 300-level BIOL, BMSC, CHEM, PSYC courses or permission of Head of School
 Approved courses: Approved courses to include at least 20 points from BIOL 340, BMSC 343. All 45 points to be achieved at B grade or above.
 Coordinator: A/Prof Peter Pfeffer

Advances in physiological and pharmacological sciences at the molecular, cellular, and organismal levels, including integrative physiology of organ systems, the mechanisms of drug interactions with biological systems, pharmacokinetics, and the structural design, targeting, and biological reactivity of molecular probes and enzymes.

BIOL 435	CRN 34054	RESEARCH SKILLS IN THE LIFE SCIENCES	15 PTS	TRI 1
-----------------	------------------	---	---------------	--------------

Prerequisite: P 40 points from (BIOL 329, BIOL 340, BMSC 301-354, BTEC 301), or permission of Head of School
 Restriction: BIOL 580; BIOL 427 in 2019-2021
 Coordinator: Prof Wayne Patrick

This course is designed to develop skills in using primary research literature, experimental design, record keeping, data presentation, statistical analysis and scientific writing. It also emphasises the importance of communicating scientific results to a variety of audiences.

BIOL 440	DIRECTED INDIVIDUAL STUDY	30 PTS
Prerequisite:	Permission of the Head of School	

A supervised programme of study approved by the Head of School.

If interested in taking this course, in the first instance you are advised to contact the graduate programme coordinator in the subject area you are interested in. There are no formal prerequisites for this course, which is available for all trimesters: permission must be obtained from the Head of School.

BIOL 519	CRN 26208	PRINCIPLES OF MARINE CONSERVATION	30 PTS	TRI 2
Prerequisite:	60 points from 300-level Marine Biology, Ecology, Environmental Studies or permission of Head of School			
Restrictions:	BIOL 419			
Coordinator:	Dr Chris Cornwall			

This course focusses on the underlying principles of marine conservation and management. Topics may include: population and extinction risks; coastal dynamics; marine chemistry and pollution; exploitation of marine resources, including fisheries ecology; bioinvasions and disease; global climate change; marine reserve ecology; and scenario planning.

BIOL 529	CRN 26209	TROPICAL MARINE CONSERVATION PRACTICE	30 PTS	TRI 2
Prerequisite:	Enrolment in PGCertMarCon, MMarCon or MSc in Marine Biology or permission of the Head of School.			
Coordinator:	Prof Simon Davy			

Students should notify the Course Coordinator of their intention to enrol by 1 March 2025.

An examination of conservation issues and practices in tropical coastal environments, with particular emphasis on coral reefs, mangroves and seagrasses. This two-week field course provides practical experience of identifying, monitoring and managing impacts on tropical marine ecosystems. The course is taught overseas and is only available to students enrolled on the Master of Marine Conservation programme.

BIOL 489	RESEARCH PROJECT	30 PTS
BMAR 489	RESEARCH PROJECT	30 PTS
EBIO 489	RESEARCH PROJECT	30 PTS

A research project on a topic approved by the Head of School.

There are multiple offerings of these courses throughout the academic year. Please contact the postgraduate coordinator to discuss your options.

BIOL 580	RESEARCH PREPARATION	30 PTS
CBIO 580	RESEARCH PREPARATION	30 PTS

A course of study in preparation for a Master's Part 2 research programme. Typical activities include undertaking preliminary research investigations and developing key practical and theoretical skills, that aid in the development of your Master's thesis proposal.

BMSC 406	CRN 19799	ADVANCED TOPICS IN BIOMEDICAL SCIENCE	15 PTS	TRI 2
-----------------	------------------	--	---------------	--------------

Prerequisite: 45 points from an approved combination of 300-level BMSC, BIOL, CHEM, PSYC courses or permission of Head of School

Coordinators: Dr Diane Ormsby

A course in which you gain tools to examine and communicate concepts within currently developing areas of major importance in biomedical science.

A detailed examination of a selection of currently developing areas of major importance in biomedical science.

BMSC 440	DIRECTED INDIVIDUAL STUDY	30 PTS	1+2/3
-----------------	----------------------------------	---------------	--------------

Prerequisite: Permission of Head of School

A supervised programme of study approved by the Head of School.

If interested in taking this course, in the first instance you are advised to contact the graduate programme coordinator in the subject area you are interested in. There are no formal prerequisites for this course: permission must be obtained from the Head of School.

BMSC 489	CRN 9862	BIOMEDICAL SCIENCE RESEARCH PROJECT	30 PTS	1+2/3
-----------------	-----------------	--	---------------	--------------

Prerequisite: Permission of Head of School

A research project on a topic approved by the Head of School.

BMSC 580	CRN 9863	RESEARCH PREPARATION	30 PTS	1+2/3
-----------------	-----------------	-----------------------------	---------------	--------------

A course of study in preparation for a Master's Part 2 research programme. Typical activities include undertaking preliminary research investigations and developing key practical and theoretical skills, that aid in the development of your Master's thesis proposal.

BIOTECHNOLOGY COURSES

BTEC 435	CRN 15708	SCIENCE OF BIOTECHNOLOGY	15 PTS	TRI 1
-----------------	------------------	---------------------------------	---------------	--------------

Prerequisite: BTEC 301 or equivalent courses that provide a good background in molecular biology and biochemistry

Coordinator: Prof David Ackerley

Seminars introducing topics of current interest in biotechnology research.

BTEC 440	CRN 15710	DIRECTED INDIVIDUAL STUDY	30 PTS	1+2/3
-----------------	------------------	----------------------------------	---------------	--------------

A supervised programme of study in biotechnology approved by the Head of School.

If you wish to take this course, contact Prof David Ackerley in the first instance. Acceptance will be for exceptional reasons only (e.g., for a student-designed project that will interface directly with a specific biotechnology company). There are no formal prerequisites: permission must be obtained from the Head of School, following the initial consultation with Prof Ackerley.

BTEC 441	CRN 15711	DIRECTED INDIVIDUAL STUDY	15 PTS	1/3
	CRN 18016			2/3

A supervised programme of study in biotechnology approved by the Head of School.

If interested in taking this course, in the first instance you should contact Prof David Ackerley. For acceptance see BTEC 440 above.

BTEC 489	CRN 15712	RESEARCH PROJECT	30 PTS	1+2/3
CBIO 489	CRN 9276	RESEARCH PROJECT	30 PTS	1+2/3

Prerequisite: Permission of Head of School

A research project on a topic approved by the Head of School.

BTEC 580	CRN 15713	RESEARCH PREPARATION	30 PTS	1+2/3
-----------------	------------------	-----------------------------	---------------	--------------

A course of study in preparation for a Master's Part 2 research programme. Typical activities include undertaking preliminary research investigations and developing key practical and theoretical skills, that aid in the development of your Master's thesis proposal.

Please note that in 2025, BTEC 436 will not be offered. Usually this is partnered with BTEC435 to make 30 points; therefore, for 2025 any other relevant 15 point BIOL, BMSC, MBIO, or CHEM course may be substituted for BTEC 436 for a PGDipSc, BSc(Hons) or MSc majoring in Biotechnology.

CLINICAL IMMUNOLOGY COURSES

CLNR 410	CRN 27056	CLINICAL IMMUNOLOGY	30 PTS	TRI 1
Prerequisite:	45 points from an approved combination of 300-level BMSC and BIOL courses including BMSC 334 or permission of Head of School; all 45 points to be achieved at B grade or above			
Coordinator:	Prof Anne La Flamme			

This course will provide a broad understanding of recent advances in immunology as well as advanced understanding in specialist areas of clinical immunology. In particular, the subjects covered shall include knowledge of current research activity in terms of theory and practice.

CLNR 411	CRN 28222	PRACTICUM IN CLINICAL IMMUNOLOGY	30 PTS	TRI 3
Prerequisite:	Enrolment in MCLinIm; and permission of Head of School			
Coordinator:	Prof Anne La Flamme			

This course enables students to gain professional work experience in clinical immunology. Each student is supervised by a host organisation involved in immunological research or applications in the public or private sectors. The placement allows students to further develop teamwork and communication skills.

CLNR 412	CRN 29135	RESEARCH PROJECT IN CLINICAL IMMUNOLOGY	30 PTS	TRI 3
Prerequisite:	Enrolment in MCLinIm; and permission of Head of School			
Coordinator:	Prof Anne La Flamme			

A research project in Clinical Immunology approved by the Head of School.

CLNR 413	CRN 29083	ADVANCED TOPICS IN CLINICAL RESEARCH 1	15 PTS	TRI 1
Prerequisite:	45 points from an approved combination of 300-level BMSC, BIOL, CHEM, PSYC courses or permission of Head of School			
Approved courses:	BMSC 301–354 (or BIOL equivalents). All 45 points to be achieved at B grade or above.			
Restrictions:	BMSC 403 prior to 2017			
Coordinator:	Prof Anne La Flamme			

CLNR 414	CRN 29084	ADVANCED TOPICS IN CLINICAL RESEARCH 2	15 PTS	TRI 2
Prerequisite:	45 points from an approved combination of 300-level BMSC, BIOL courses including BMSC 334 or permission of Head of School.			
Approved courses:	BMSC 301–354 (or BIOL equivalents). All 45 points to be achieved at B grade or above.			
Restrictions:	BMSC 404 prior to 2017			
Coordinator:	Prof Anne La Flamme			

This course aims to develop an advanced understanding of specialist clinical areas within the broad discipline of clinical research. In particular, the subjects covered may include such topics as pharmacology, haematology, or surgical interventions and shall include knowledge of current research activity in terms of theory and practice. This course is organised into modules, each covering independent topics with specific clinical aspects. Individual modules may include lectures, seminars, oral presentations or written assignments. This course will take place at the Wellington Hospital site.

CLNR 510	CRN 28223	ADVANCED CLINICAL IMMUNOLOGY	30 PTS	TRI 2
-----------------	------------------	-------------------------------------	---------------	--------------

Prerequisite:	Enrolment in the MClinIm and approval to proceed to Part 2
Coordinator:	Dr Lisa Connor

This course will enable the development of an advanced understanding in clinical immunology. Specifically, this course shall promote critical analysis of recent advances and clinical trials and will emphasize the development of skills in science communication.

CLNR 511	CRN 28224	RESEARCH DESIGN AND IMPLEMENTATION	30 PTS	TRI 3
-----------------	------------------	---	---------------	--------------

Prerequisite:	Enrolment in the MClinIm and approval to proceed to Part 2
Coordinator:	Prof Anne La Flamme

This course consists of the mentor-guided development of a clinical or immunological study including the implementation pathway. In particular, students will design and produce a research proposal complete with a literature review, methodological detail, a budget, and ethical considerations.

CLINICAL RESEARCH COURSES

CLNR 401	CRN 18711	INTRODUCTION TO CLINICAL RESEARCH AND CLINICAL TRIAL PRACTICE	15 PTS	TRI 1
-----------------	------------------	--	---------------	--------------

Prerequisite:	Approval of Course Coordinator
Coordinator:	Dr Richard Carroll & Dr Irene Braithwaite

A broad framework for understanding clinical research including the critical appraisal of the literature, clinical trials planning, preparation and implementation.

CLNR 402	CRN 18712	ETHICS AND RESEARCH IN SPECIAL POPULATIONS AS APPLIED TO CLINICAL RESEARCH	15 PTS	TRI 1
-----------------	------------------	---	---------------	--------------

Prerequisite:	Approval of Course Coordinator
Coordinator:	Dr Richard Carroll

An understanding of the place of ethics in clinical research common ethical issues that arise and how to analyse them and find solutions. The role of ethics committees, applications to ethics committees and Good Clinical Practice. An in-depth consideration of obligations under the Treaty of Waitangi with special regard to ethics and community-based research. The development of an appropriate and inclusive approach to clinical research with special populations.

CLNR 403	CRN 18713	BIostatISTICS AND INFORMATICS	15 PTS	TRI 2
Prerequisite:	Approval of Course Coordinator			
Coordinator:	Dr Lisa Woods			

Biostatistics relevant to clinical research with the focus on quantitative methods and applications for clinical trials. Informatics will be introduced with its application to clinical research including information gathering, processing and storage.

CLNR 404	CRN 18714	QUALITIVE METHODS IN CLINICAL RESEARCH	15 PTS	TRI 2
Prerequisite:	Approval of Course Coordinator			
Coordinator:	Dr Martin Woods			

An understanding of the place of qualitative research in clinical research both as stand-alone and combined with quantitative research. This course will include interview techniques contrasting advantages and disadvantages of different approaches and a range of other qualitative techniques.

CLNR 405	CRN 18715	ADVANCED CLINICAL RESEARCH DESIGN, MANAGEMENT AND ANALYSIS	30 PTS	TRI 1
Prerequisite:	CLNR 401, 402, 403, 404			
Coordinator:	Prof Elaine Dennison			

An understanding of the practices and processes of clinical research, including clinical trials, project management, regulatory reports and audits, requirements specific to industry-funded research and the preparation and submission of study reports for publication.

Students must complete courses CLNR 401–404, prior to enrolling in CLNR 580.

CLNR 580	CRN 18716	RESEARCH PREPARATION	30 PTS	TRI 2
Prerequisite:	CLNR 405			
Coordinator:	TBC			

Students will bring together material from many of the other courses and write an original, full, research grant application describing a proposed clinical research project: background and aims, clinical relevance, hypotheses to be tested, design and methods, analysis of results, dissemination of results, a plan for project management including staffing, budget, timeline and milestones for project delivery and quality management issues, consultation, an ethics committee application for the project and any other regulatory body applications required.

CLNR 591	CRN 23059	THESIS IN CLINICAL RESEARCH	120 PTS	
Prerequisite:	PGDipClinRes or its equivalent or approval by Programme Director			
Coordinator:	TBC			

Master's thesis in Clinical Research.

Students are part-time and enrol in 30 points at a time, beginning in Trimester 1, and complete the programme on a part-time basis over two years.

DRUG DISCOVERY AND DEVELOPMENT COURSES

DRGD 401	CRN 28255	CHEMICAL BIOLOGY AND DRUG DISCOVERY	15 PTS	TRI 1
-----------------	------------------	--	---------------	--------------

Prerequisite: CHEM 301 (or CHEM 441 as co-requisite)

An advanced course covering target identification and validation, biological assays and use of natural products in the context of drug discovery.

DRGD 402	CRN 28256	DRUG DESIGN	15 PTS	TRI 2
-----------------	------------------	--------------------	---------------	--------------

Prerequisite: CHEM 201; 30 points from an approved combination of 300-level BMSC, BIOL, CHEM courses

An advanced course with a focus on medicinal chemistry and the formulation of active pharmaceutical products.

DRGD 403	CRN 28257	DRUG DEVELOPMENT	15 PTS	TRI 2
-----------------	------------------	-------------------------	---------------	--------------

Prerequisite: 15 points from CHEM 201, 203, 225; 30 points from an approved combination of 300-level BMSC, BIOL, CHEM, SCIE

An introduction to advanced-stage development of drugs, synthesis scale-up and cGMP practices, pharmaceutical analytical chemistry, protection of intellectual property and regulatory requirements.

DRGD 561	CRN 28258	APPLIED RESEARCH PROJECT	60 PTS	TRI 3
-----------------	------------------	---------------------------------	---------------	--------------

Prerequisite: 120 points from approved combination of 400-level BMSC, BIOL, CHEM, DRGD courses or approval of the Programme Director

Restrictions: DRGD 590

One or more problem-solving projects that provide students with experimental and research skills.

DRGD 580	CRN 28259	RESEARCH PREPARATION	30 PTS	1+2/3
-----------------	------------------	-----------------------------	---------------	--------------

Prerequisite: As required for acceptance into the programme

A course which equips students with the skills required to effectively perform research, and includes literature retrieval and surveys, report writing, data reporting and statistical analysis, development of a research proposal and problem-solving skills.

DRGD 590	CRN 28260	RESEARCH PROJECT	60 PTS	TRI 2
-----------------	------------------	-------------------------	---------------	--------------

Prerequisite: 120 points from an approved combination of 400-level BMSC, BIOL, CBIO, CHEM, DRGD courses to include 30pts from DRGD 580, CHEM 580, CBIO 580 or approval of the Programme Director

Restrictions: DRGD 561

An advanced course with a focus on medicinal chemistry and the formulation of active pharmaceutical products.

DRGD 595	CRN 28261	RESEARCH THESIS	90 PTS	1+2+3
-----------------	------------------	------------------------	---------------	--------------

Prerequisite: 45 points from an approved combination of 400-level BMSC, BIOL, CBIO, CHEM, DRGD with a minimum grade average of B+ or approval of the Programme Director

Restrictions: DRGD 561, 580, 590

A research project leading to a research thesis.

ECOLOGICAL RESTORATION COURSES

ERES 525	CRN 13632	ECOLOGICAL RESTORATION	30 PTS	TRI 1
-----------------	------------------	-------------------------------	---------------	--------------

Coordinator: A/Prof Stephen Hartley

Theory and practice behind the restoration of flora and fauna and functions to degraded sites, with presentations by leading NZ scientists and restoration practitioners. Students will visit current restoration projects, e.g., Zealandia.

NOTE: This course capacity for 2024 is capped at 15 students, with preferential entry for students with an ERES major.

ERES 526	CRN 13758	ECOLOGICAL RESTORATION PRACTICUM	30 PTS	TRI 2
-----------------	------------------	---	---------------	--------------

Coordinator: A/Prof Stephen Hartley

A project-based exploration of practical issues underpinning ecological restoration. Students will develop practical skills and obtain knowledge enabling them to contribute to a local restoration project. Focus will be placed on the skills required to develop a restoration plan, implement restoration management and to evaluate the success of restoration efforts. **NOTE: This course capacity for 2025 is capped at 15 students**

MOLECULAR MICROBIOLOGY COURSES

MBIO 434	CRN 13742	MICROBIOLOGY	30 PTS	TRI 1
-----------------	------------------	---------------------	---------------	--------------

Coordinator: Dr Joanna MacKichan

Seminars introducing topics of current interest in microbiology research, providing insight into techniques used in microbiology and the development of new knowledge in the field.

MBIO 440	CRN 13743	DIRECTED INDIVIDUAL STUDY IN MICROBIOLOGY	30 PTS
-----------------	------------------	--	---------------

Prerequisites: Permission of the Head of School

Restriction: BIOL 440

Coordinator: Dr Joanna MacKichan

A supervised programme of study approved by the Head of School.

Note: if interested in taking this course, in the first instance you are advised to contact the graduate programme coordinator in the subject area you are interested in.

MBIO 489	CRN 13744	RESEARCH PROJECT	30 PTS	1+2/3
-----------------	------------------	-------------------------	---------------	--------------

Prerequisites: Permission of the Head of School

A supervised project involving original research and leading to the production of a dissertation.

MBIO 580	CRN 13745	RESEARCH PREPARATION	30 PTS	1+2/3
-----------------	------------------	-----------------------------	---------------	--------------

A course of study in preparation for a Master's Part 2 research programme. Typical activities include undertaking preliminary research investigations and developing key practical and theoretical skills, that aid in the development of your Master's thesis.

2025 INDICATIVE RESEARCH PROJECTS AVAILABLE

Below is a list of potential Honours, and Masters projects within the School of Biological Sciences. However, this is not an exhaustive list (new projects often become available throughout the year), so please feel free to contact any potential supervisors of interest directly.

More information on the research interests of all of our academic staff members can be found on the School of Biological Sciences website:

<https://www.wgtn.ac.nz/sbs/about/staff#academic>

David Ackerley

david.ackerley@vuw.ac.nz

My team has a strong interest in the discovery and engineering of bacterial enzymes, to either understand basic biology or achieve useful outcomes. In particular, we have recently developed novel methods to clone fragments of environmental DNA (e.g., purified as a complex mixture of many thousand bacterial genomes derived from soil samples) in a way that maximises the likelihood of captured genes being expressed effectively in *E. coli*. This allows us to screen for colonies that have gained an enzymatic activity we are particularly interested in. Often this will be a promiscuous activity that nature has never selected for, but which is of great value to biotechnology. In those cases, we can subsequently use random gene mutagenesis and artificial selection to improve those activities to useful levels. Alternatively, we are also interested in achieving synthetic biology solutions to generate novel drug candidates in hosts like *E. coli*, and developing combinatorial approaches to reengineer biosynthetic gene clusters so that hundreds of new molecules are produced in parallel. It is likely that any summer project or Honours/Masters projects in my lab will focus on one of these areas.



KC Burns

kevin.burns@vuw.ac.nz

My lab's research focuses on two main themes: 1) Repeated patterns in the evolution of plants and animals on isolated islands, 2) The evolution of biological complexity, focusing on the social behaviour of staghorn ferns. Come see me in TTR326 (my door is always open) if you want to hear more about potential projects.



James Bell

James.bell@vuw.ac.nz

My research group has a strong focus on anthropogenic impacts on subtidal communities, particularly sponges and protected coral species. We are interested in the shallow subtidal zones accessible by SCUBA, as well as deeper mesophotic reefs, which we access using Remotely Operated Vehicles. Recently, our work has concentrated on the impacts of marine heatwaves (MHWs), which have had significant effects on marine ecosystems in New Zealand and around the world. I am offering two projects this year related to marine heatwave impacts, though I would also be happy to discuss other aspects of my research program with interested students.



1. Is light or temperature the major driver of sponge bleaching?

In 2022, New Zealand experienced an extreme marine heatwave event that particularly affected sponges across the country. In Fiordland, reports indicated sponge bleaching, which we found impacted and killed over 30 million sponges. This is the largest event of its kind ever reported. The global media covered this event extensively, and it has been the focus of several high-impact research publications. However, we still do not know whether the temperature caused the sponges to die or if it was the result of very high light levels due to much calmer conditions in Fiordland during the marine heatwave. This project will directly address this question to determine the cause of sponge mortality in Fiordland. The student on this project is also likely to be involved in a research cruise to Fiordland.

2. Are marine heatwave-exposed organisms better able to deal with successive marine heatwaves?

My research group has recently conducted several marine heatwave simulation experiments at the VUW Coastal Ecology Laboratory with many sponge species. While different species have different tolerances to MHW temperatures, we have found many MHW 'survivors' across various species. We have also observed changes in the microbes inside sponges when they are exposed to MHWs, proposing that this is an adaptive strategy enabling sponges to better cope with future MHWs. This project will identify what makes these survivors 'special' and whether they are better equipped to handle future or more extreme heatwaves.

Zaramasina Clark

zaramasina.clark@vuw.ac.nz

My lab group uses *in vitro* models and molecular biology tools to study the ovarian follicle. We work to understand and identify the key factors that contribute to infertility in female mammals. Current research projects in my lab include:

1. Understanding how altered body composition (increased adiposity), is detrimental to assisted reproductive technology (ART) outcomes. This is part of a wider project that aims to understand the perceived and systemic barriers to Pacific peoples' access to ART in Aotearoa.
2. Understanding the role of theca cell progenitors in ovulation (follicle rupture). We're interested in understanding how exposure of theca cell progenitors to stressors before they are recruited to the follicle, ultimately programs the ovulation potential of the follicle.



I have Honours/Masters projects available in my group in 2025 so if you're interested in either of these projects, let's set-up a time to meet and discuss.

Christopher Cornwall

christopher.cornwall@vuw.ac.nz

Website: <https://www.coastalecophysiology.com/>

My group uses tools from ecology, physiology and geochemistry to answer questions about how seaweed-dominated ecosystems respond to the impacts of climate change and extreme events in kelp forests and coral reefs. Below are some topics of interest, with possible scholarships in the research year:

- How will kelp forest seaweeds, pāua and kina respond to multiple drivers of local and anthropogenic climate change (marine heatwaves, ocean acidification, warming, sedimentation)?
- Impacts of climate change on corals and calcifying seaweeds in Tropical systems
- Seaweed ecology: restoration of giant kelp and Karengo. Mapping declines in giant kelp due to local and global change.



Davide Comoletti

Davide.comoletti@vuw.ac.nz

In our lab, we work on fundamental molecular mechanisms of brain development. The focus of our research is on the proteins that connect synapses and we work hard trying to learn how these proteins function, how they look (their structures) and why and how some genetic mutations are implicated in neurodevelopmental diseases. We often work on these projects with overseas collaborators. We have several projects that are suitable for honours, MS, or PhD programs, get in touch if you want to learn more about them.



Simon Davy

simon.davy@vuw.ac.nz

Masters projects (typically 1-2 per year) are available.

My lab works on the symbiosis between cnidarians and dinoflagellate algae that forms the foundation of coral reefs. We especially focus on the functional biology of this symbiosis at the cellular and physiological levels, and in recent years we have studied the adaptability of this symbiosis, and hence reef corals, to climate change. My lab typically uses a model systems approach for understanding symbiosis function.



Specific areas of interest:

- inter-partner recognition and communication.
- cellular and immunological basis of symbiosis establishment.
- nutritional physiology.
- coral bleaching physiology and the cellular determinants of thermal sensitivity.
- physiological diversity and biogeography of symbiotic dinoflagellates.

Darren Day

darren.day@vuw.ac.nz

I will be offering projects that support our molecular neuroscience research. Honours and /or Masters projects are available to study

- How psychedelics and serotonin impact learning and memory
- The role of mitochondria in regulating neuroplasticity
- Epigenetic regulation of aversive memory

Using planaria as a model organism we will test out hypothesis that the serotonergic system acts directly on mitochondria to regulate their bioenergetic activity and that these bioenergetic changes underpin the effects of serotonin and psilocybin on mood, learning and memory.

The projects will use models of aversive learning and RNA interference to address the above.



Nicola Day

nicola.day@vuw.ac.nz

<https://www.plantandsoilecology.com/>

My research group focusses on disturbance ecology of soil microbes and plants, drought, and land-use change. We use field and lab experiments to understand components that make ecosystems resilient to global change and we love using R!

I have a couple of MSc/Honours projects available for 2025:

- Plant-soil-microbial interactions and soil carbon dynamics.
- Bioinformatics-based projects on soil fungal communities in tussock grasslands (eDNA).



Elaine Dennison

Elaine.dennison@vuw.ac.nz

I am a clinician and epidemiologist with a special interest in bone health who is based largely in the UK. I have a number of collaborative projects available for Masters study, using a mixture of quantitative and qualitative methodology. Systematic reviews are also available. Possible topics include (but are not limited to) educational interventions for bone health in adolescents and young adults, and long COVID in relation to musculoskeletal health.



Julie Deslippe

Julie.deslippe@vuw.ac.nz

Our research focuses on plant-soil community interactions in response to multiple drivers of ecosystem change. Current projects focus on alpine ecosystem ecology in Tongariro National Park. I am currently recruiting students for two positions:



1) Post-graduate thesis (Honours or MSc): This project will explore how invasive plants alter soil moisture and drought stress in native alpine plants in Tongariro National Park. The suitable applicant will be highly organised, able to work effectively in a team, and have basic skills in data management and statistics. They will be interested in learning native plant identification and ecophysiology and in conducting field work in remote and sometimes rugged environments.

2) PhD student: This PhD will explore the role of fungal communities in ecosystem carbon cycling in the context of multiple drivers of ecosystem change (climate warming and invasive plants). The suitable applicant will be highly organised and capable of effectively leading field teams in remote and sometimes rugged environments. They will have strong skills data management and statistics and an interest in learning native plant identification and ecosystem carbon flux measurements.

Antoine Felden

antoine.felden@vuw.ac.nz

Marsden-funded MSc project available (co-supervised by Phil Lester)

Honeybees are under pressure globally, threatened by a multitude of interacting factors. Parasitism by the *Varroa destructor* mite and the viruses it vectors to bees is a leading cause of colony collapse in Aotearoa and around the world. I am interested in how viral interactions within *Varroa* mites may affect virus transmission to bees. For this project, we will test the hypothesis that experimental viral inoculations of *Varroa* can limit viral infections in the bees they parasitise. You will rear *Varroa* and bees in the laboratory, purify and inoculate viruses, run lots of qPCR as well as analyse high-throughput sequencing data. It's also a great opportunity to learn a bit about beekeeping!



Monica Gerth

monica.gerth@vuw.ac.nz

<https://molecules-and-microbes.org>

Our group explores how microbes navigate the environment and cause diseases. We have a particular interest in kauri dieback disease, but this interest spills over into lots of different areas. We take a multi-disciplinary approach to research: our group is a mix of microbiologists, chemists, biochemists and bioinformaticians. We believe research is more productive (and interesting) when we collaborate across disciplines. Therefore, experience in microbiology (e.g. BIOL236 or BMSC301) is helpful, but not required.



Our research projects range from field trials in kauri forests to developing molecular tools such CRISPR-Cas in *Phytophthora agathidicida* (the microbe that causes kauri dieback).

Stephen Hartley

stephen.hartley@vuw.ac.nz

Spatial Ecology / Restoration Ecology and Conservation



I welcome students bringing their own ideas that share some overlap with the topics below. Examples of projects available include:

- Forest restoration. E.g. Managing successional trajectories of native tree-planting / comparing mānuka, kānuka and gorse as nurse trees.
- Wetland restoration
- Invertebrate conservation
- Urban ecology. E.g. Biodiversity responses to Predator-Free Wellington's elimination of rats on Miramar peninsular.
- Spatial ecology and movement models of small mammals or large invertebrates (weta, Peripatus, spiders or beetles).
- Species' distribution modelling.

Bronwyn Kivell

bronwyn.kivell@vuw.ac.nz

Honours and Masters projects will be available in 2025 in several neuroscience and drug-development areas including:

- **Developing better safer pain medications:** Identifying the cell signalling pathways that are responsible for desirable analgesic effects and side effects of opioids such as respiratory depression, addiction and tolerance.
- **Developing novel drugs to promote repair and recovery in multiple sclerosis.** Understanding the mechanism of action of how drugs acting on kappa opioids promote remyelination.
- **Neuroinflammation** looking at the role of microglia in driving neuroinflammation and how activation of the kappa opioid receptor drives microglia towards healing and repair processes.
- **Alzheimer's Disease:** Demyelination and neuroinflammation occurs with the aging brain and before the onset of symptoms in Alzheimer's Disease (AD). Using genic models of AD and demyelination this project will explore the role that demyelination plays in AD pathology and determine whether repairing damaged myelin is a strategy for treating AD.



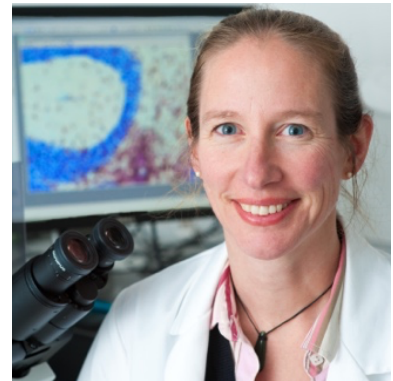
Projects using animal models of disease and analysis of tissue using confocal and fluorescence microscopy, in situ hybridisation (RNA scope), electron microscopy, western blotting, cell signalling assays and real-time PCR may be utilised in these projects. We are especially looking at high-throughput cellular assays to screen drugs for desirable therapeutic effects.

Anne La Flamme

anne.laflamme@vuw.ac.nz

Honours and Master's projects will be available in a range of areas in clinical immunology, basic immunology and applied cell biology including:

- **Exploring the regulation of central nervous system inflammation (CNS).** Using *in vitro* and *in vivo* models of CNS infiltration, we are exploring the pathways which regulate the number and phenotype of immune cells that migrate into the CNS. In particular, we are exploring how to regulate the pathways associated with inflammatory trafficking while preserving the steady state transit of immune cells through the CNS for immunosurveillance.
- **Modifying inflammation with immunomodulatory agents.** In these projects, the effect of immunomodulatory compounds on immune response development and effector functions will be investigated. These agents may include known immune activators, novel natural products, or repurposed drugs and may include *in vitro* or *in vivo* assays with primary mouse or human immune cells.
- **Understanding the role of the immune system in neuroregeneration.** We are investigating the molecular pathways by which immune cells can support or directly mediate repair and recovery after neuroinflammatory damage.



Olivier Lamiable (Adjunct Faculty)

olamiable@malaghan.org.nz

At the Malaghan Institute of Medical Research, I focus my research on the fundamental biology behind the development of allergies. Along with Professor Franca Ronchese and the Ronchese Laboratory team, we study dendritic cells and T cells, which are essential populations for allergic immune responses. As a molecular immunologist, I combine immunology with single cell RNA sequencing technologies and bioinformatics to explore what triggers these cells to mount allergic responses.

There are several computational projects available in my team for students with an interest in immunology who are keen to learn about the bioinformatic analysis of single cell RNA sequencing data to reveal new mechanisms to treat allergies.



Peter Larsen (Adjunct Faculty)

peter.larsen@otago.ac.nz

Honours and Masters projects may be available. My lab group (based at the Wellington Hospital) focuses on conducting translational research in cardiovascular disease. We are interested in how acute levels of inflammation following a heart attack can be used to risk stratify patients. We aim to better identify those patients who are most at risk of adverse clinical events in order to personalise medical therapy and improve health outcomes.



Rory Little

rory.little@vuw.ac.nz

Finding new drugs from the bugs within bugs.**Co-supervised Honours and Masters projects.**

Many insects contain symbiotic bacteria that aid in digestion, communication, or defence from pathogens. Defensive bacterial symbionts produce specialised bioactive organic compounds (collectively called natural products or secondary metabolites) that protect the insect, its offspring, or its food source from microbial pathogens. New Zealand is rich in unique and diverse insect species, boasting at least 18,000 endemic species, encompassing 25 of the 29 different insect orders and constituting 90% of all its insect species—a proportion rivalled by few other countries. Despite such insect abundance, diversity, and uniqueness, almost nothing is known about their bacterial symbionts and the natural products these produce. The goal of my research is to address this deficit, enhancing our understanding of the chemical ecology of New Zealand insects, and screening these isolated bacterial symbionts for next generation antibiotic drugs.



Projects will appeal to students interested in entomology, microbiology, biochemistry, genomics, and organic chemistry. I offer a highly supportive environment and will help you learn the necessary skills. I will (*fingers crossed*) be able to offer a Master's Part 2 scholarship from 2025. Happy to chat to any prospective students!

Phil Lester

Phil.Lester@vuw.ac.nz

My group focuses on pest and pathogen control, primarily with social insects. We currently have a major focus on honey bees. Specifically, how do we safely control parasitic varroa mites and the viruses that they transmit? How effective are current pesticides for the control of these pests in beehives? We use a variety of approaches to answer such questions including RNA interference or immunotherapy based techniques. Bees, wasps and ants are fascinating. If you've a passion for these social insects, come talk to me.

We are looking for an outstanding and motivated MSc student to join the Lester lab. Note that bees are only active from Spring to Autumn, hence significant commitment to the project will be expected during that time, especially in Summer. If you're interested, contact me for more info :)



Joanna Mackichan

joanna.mackichan@vuw.ac.nz

The main research interest of my laboratory is the interaction between bacterial pathogens and the host. The overall goal is to better understand how bacteria colonise, persist, and evade immunity to establish infections, with the aim of improving interventions and diagnostics. We study two Gram-negative pathogens that both infect the human bloodstream. These include (i) *Bartonella quintana*, a stealth pathogen that lives in the host bloodstream for long periods, evading immunity and invading red blood cells; and (ii) *Neisseria meningitidis*, a pathogen that is frequently harmlessly carried in the airways, but which can invade the bloodstream and replicate rapidly to cause meningococcal disease. Specific research projects (Honours and Masters) are available with both of these projects in my laboratory at VUW.



Melanie McConnell

melanie.McConnell@vuw.ac.nz

Kia ora! Research in my laboratory focuses on understanding why the primary brain cancer glioblastoma is so hard to kill – these cancers are resistant to chemotherapy, radiation and immunotherapies. We use a wide variety of techniques in cell and molecular biology to investigate potential mechanisms of resistance and to come up with approaches to combat this.

In 2025, Honours and Masters projects may be available in the following areas:

- Proteomic response to chemotherapy and radiation
- Immune-cancer-stromal cell interactions
- Pre-clinical glioblastoma models



Andrew Munkacsi

andrew.munkacsi@vuw.ac.nz

Chemical Genomics Laboratory

Molecular mechanisms (the interacting network of genes, proteins and pathways) are critical to fully understand and treat human diseases. Projects available in my lab will use genomic, proteomic and/or metabolomic analyses in model organisms to determine the mechanisms of action of “local” natural products (*e.g.*, Māori and Samoan traditional medicine, cannabis, feijoa, and orchids) to treat human diseases with defects in lipid metabolism (*e.g.*, obesity, diabetes, cardiovascular diseases, and neurodegenerative diseases) via collaborations with traditional healers, iwi, hapū and biotech companies.



Diane Ormsby

diane.ormsby@vuw.ac.nz

Kia ora! Tuatara are the last surviving member of the order Rhynchocephalia, and are unique in that they are the only reptile without an intromittent organ, so trying to predict what a living tuatara sperm was going to look like was challenging! Tuatara sperm collected from living animals were characterised for the first time in a PhD project recently co-supervised by the Ormsby and Nelson lab groups. We also conducted some initial studies into the feasibility of freezing tuatara sperm to preserve genetic diversity. A Master's project assessing the effectiveness of selected cryo-protectants for tuatara sperm is available in my group in 2025, so if you are interested in this project, please contact me.



Jeremy Owen

Jeremy.owen@vuw.ac.nz

My laboratory group is focussed on discovering new antibiotics to treat drug resistant bacterial infections. Most of the antibiotics in the clinic today were discovered from soil dwelling bacteria during the mid to late 20th century. In our research, we apply modern genomics and synthetic biology approaches to find new antibiotic candidates. By generating and analysing large amounts of DNA sequence data from soil dwelling bacteria, we can find collections of genes that might produce new antibiotics. We then clone these genes and express them in a laboratory friendly bacterium to isolate and characterise new antibiotic leads. Projects I am offering this year are:



- 1) **Discovery of new antibiotics using genome mining:** This project involves a blend of genomics and synthetic biology techniques. Genes specifying antibiotic production will be identified in genome sequence databases. These will then be captured in a vector using CRISPR-Cas12a mediated cloning and expressed in a panel of laboratory bacteria.
- 2) **Optimisation of cyclic peptide antibiotic leads using semi-synthesis and synthetic biology:** We are currently working on several promising lead structures that were isolated by genome mining. In this project, derivatives of these leads will be generated by either chemical modification of the naturally occurring compound or engineering of the genes that produce the compound to bring about changes in the structure they produce. New compounds will then be evaluated for efficacy against drug-resistant bacteria, as well as toxicity against human cell lines.

Wayne Patrick

wayne.patrick@vuw.ac.nz

<https://molecules-and-microbes.org>

We study enzymes. These amazing catalysts accelerate biochemical reactions by up to 23 orders of magnitude. Understanding their structures, functions and evolution is essential for designing high-value biocatalysts and for comprehending the wondrous metabolic diversity of life on our planet. Potential areas for Hons/MSc projects in 2025 include:



- Exploring the evolution of two enzymes in carbohydrate metabolism: phosphofructokinase and triosephosphate isomerase. We are studying these enzymes from quirky organisms across the tree of life. Solving atomic structures has suggested hypotheses about their evolution. Your project will be to test one of these hypotheses by designing mutated versions of the enzymes and studying the effects of the mutations on structure and function.
- Developing enzyme-based biotechnologies. We have a variety of biotech projects on the go, including: (a) building enzyme-based biosensors; and (b) working with winemakers to identify enzyme-based solutions for two key problems they encounter during fermentation.

Janet Pitman

janet.pitman@vuw.ac.nz

My research uses tools in molecular biology, transcriptomics, tissue culture and biochemistry to explore molecular mechanisms and develop diagnostic tests.

We focus on improving *in vitro* fertilisation (IVF) success and embryo quality, detecting early ovarian cancers and understanding the link between kākāpō breeding and rimu fruiting.



Feel free to contact me to see if I have any projects available. Projects in my team would suit Honours/Masters/PhD students with an interest in reproductive biology, biotechnology and/or molecular biology.

Peter Pfeffer

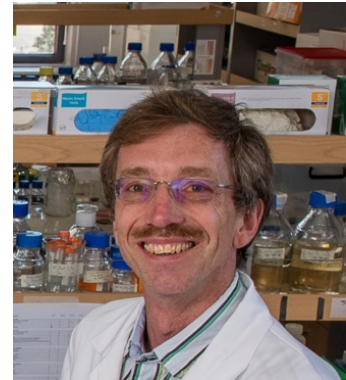
peter.pfeffer@vuw.ac.nz

We are keen to understand the early events that underlie the increasing complexity of early mammalian embryos. How do the first totipotent cells decide whether to become placenta or embryo proper? How does the second lineage decision occur? How is the anterior posterior axis established and what induces gastrulation?

We are addressing many of these questions using predominantly cattle but also mice and even guinea pigs as our model systems. Our lab specialises in growing cattle embryos in culture and are experts in in vitro fertilisation and embryo production procedures. We are working with human, mouse and cattle embryonic and trophoblast stem cells to explore signalling interactions occurring in the embryo as well as for practical application such as creating synthetic meat. The main drive is to understand the molecular machinery underlying early developmental decision so as to gain an evolutionary understanding of how a mammal is assembled.

Tools and techniques commonly used in the lab include overexpression and knock-out reagents including fluorescent proteins and CRISPR, gene and protein detection methods such as RT-PCR, in situ hybridisation and immunofluorescence followed by confocal microscopy and of course a gamut of standard molecular and cell biological approaches. We'll teach you what you need for your project to be successful!

Feel free to pop past my office in TTR319 for a chat about our projects and how you would fit in.



Peter Ritchie

peter.ritchie@vuw.ac.nz

Population and evolutionary genetics

Kia ora! I supervise MSc and PhD projects that involve:

- Population genomics with an emphasis on fisheries species.
- Phylogeographic analysis of coastal New Zealand environments using mitochondrial DNA.
- Modelling climate-change induced distribution shifts and testing for an adaptive response to a warming climate.
- Genome assembly and a comparative analysis of genome evolution.

Projects in my research group often include collaboration with researchers at Te Papa and NIWA. Please feel free to get in touch to see what projects are available. I'm always keen to discuss other potential project ideas that involve population genetics, genomics, and climate-change related evolutionary research.



Alice Rogers

alice.rogers@vuw.ac.nz

MSc projects are available under a broad general theme of fisheries biology. I can link students to potential opportunities for stipend funding and co-supervision with NIWA / Fisheries NZ, particularly if they are keen to do something quantitative (e.g. population / ecosystem modelling and some additional stats). I'm also happy to support lab and/or field-based projects relating to climate change in coastal ecosystems and have some interest in supporting projects involving paua and kina at present.



Ashley Rowden

ashley.rowden@vuw.ac.nz

Marine ecology and environmental management

**MSc projects****Deep-sea**

- Seafloor communities of deep-sea habitats
- Trawling and other disturbance impacts on seafloor communities

Sandy beaches

- Clam and other invertebrate communities of sandy beaches
- Role of bird predation in structuring clam populations on sandy beaches

I work part-time at NIWA, and deep-sea projects will be based at NIWA using available data, including seafloor images. Opportunities to join research voyages will be sought. I can also facilitate the taking of projects on other topics that will be supervised by NIWA staff (I largely act as the 'administrative' supervisor).

Rachael Shaw

rachael.shaw@vuw.ac.nz

Avian behaviour, cognition and conservation



My research group focusses on the cognitive ecology of New Zealand's endemic birds. We examine how selection shapes cognitive ability and explore how cognition might be harnessed as a conservation tool in urban areas. Our research is largely based at Zealandia, with a focus on toutouwai and kākā. We use observational studies and behavioural experiments to examine how birds learn and remember information that is vital to their survival and reproduction.

Potential projects include:

- Developing AI based tools to recognise individual kākā (computer science background required)
 - Examining the survival and reproduction of toutouwai dispersing outside Zealandia
-

Jeff Shima

jeffrey.shima@vuw.ac.nz

http://personal.victoria.ac.nz/jeffrey_shima/

My lab group studies life histories and population dynamics of fishes and invertebrates. The overall objective of our research is to understand the drivers of change in ecological systems. We use a wide range of quantitative methods (including field and lab-based experiments, observational studies, otolith-based demographic reconstructions, and theory) to understand how and why populations of marine organisms fluctuate, increase or decline.

Our current research interests are detailed on our lab group's website (see link above), and I would encourage you to check this out if you are considering our group as your new academic home. Briefly, some indicative projects might include:

- Effects of moonlight (and/or light pollution) on reproduction and larval development of fish or invertebrates.
- Sources of variation in larval dispersal, population connectivity and/or recruitment of fish or invertebrates.
- Effects of within-species phenotypic variation (large vs small body size, bold vs shy behavioural syndromes, etc) on fundamental ecological interactions (e.g., predation, competition, etc).
- Reconstructing fish life histories from ear bones.

Any projects conducted within my group could have a diving and/or boating component, but this is also not essential.



Paul Teesdale-Spittle

paul.teesdale-spittle@vuw.ac.nz

Honours and/or Masters projects are available in the following areas:

- Mechanisms of therapeutic control of protein production (translation).
- Design, synthesis and evaluation of bioactive small molecules.
- Cellular responses to bioactives.



Helen Woolner

Helen.woolner@vuw.ac.nz

Kia Orana! My research interests are in the isolation and biological activity of secondary metabolites from traditional medicinal plants, marine invertebrates and marine fungi. Secondary metabolites have captivated researchers in the field, who continue to pursue these fascinating molecules for both their complex chemical structures and their potential as therapeutic agents in the treatment of human diseases, such as microbial infection and cancer. A range of analytical techniques, spectroscopic and spectrometric methods are used to purify and elucidate the structures of natural products.

I'm happy to chat with anyone who is interested and would like to know more.



Joe Zuccarello

joe.zuccarello@vuw.ac.nz

Projects are available in the following areas:

- Genetic diversity (taxonomy) of seaweeds in New Zealand.
- The biology of karengo (nori. *Pyropia* etc) in New Zealand.
- Applied phycology (Physiological responses of potential commercial seaweeds).
- Any other seaweed-related projects, including freshwater algae.





VICTORIA UNIVERSITY OF
WELLINGTON
TE HERENGA WAKA