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WELCOME TO BIOLOGICAL SCIENCES

The School offers a rich diversity of research and teaching programmes in an environment which will stimulate and challenge undergraduate and postgraduate students alike.

We are committed to excellence in teaching at all levels. Our undergraduate programmes will provide you with a solid foundation in a wide variety of subject areas including biodiversity, biomedical science, chemical genetics, ecological restoration, marine biology, microbiology, molecular evolution and proteomics.

Our commitment to teaching is underpinned by first-hand research experience in all areas of our degree programmes. We have an outstanding publication rate and are proud of the level of external research funding that the School attracts. This relationship between teaching and research provides real context for the study of biology and ensures our taught curriculum is kept fresh and up to date.

The School has 35 academic staff members, well supported by skilled technical and administrative staff. Two applied [research centres](#) are supported by the School and we have strong collaborative links with many research organizations including [NIWA](#), [ESR](#), the [Malaghan Institute of Medical Research](#) and [Capital & Coast District Health Board](#). These links provide students with a multidisciplinary and multifaceted degree and they often work with potential employers during their research placements.

Our laboratory facilities are world class. For example, we have a stunning new [coastal ecology laboratory](#) fully equipped with an associated research vessel, and a state-of-the-art chemical genetics facility. Please have a look around our website for more information about our School, especially the [facilities](#), [staff](#) and [research](#) pages.

I would like to take this opportunity to welcome you to the School and wish you the very best for your studies.

Associate Professor Phil Lester
Head of School
School of Biological Sciences
Te Kura Mātauranga Koiora

IMPORTANT DATES

Trimester 1 commences	5 Mar
Good Friday	6 Apr
Easter Monday	9 Apr
Mid trimester break	6 Apr – 22 Apr
Graduation	15 – 17 May
Queen's Birthday	4 Jun
Examinations	15 Jun – 4 Jul
Mid year break	5 Jul – 15 Jul
Trimester 2 commences	16 Jul
Mid trimester break	27 Aug – 9 Sep
Labour Day	22 Oct
Examinations	26 Oct – 17 Nov
Trimester 3 commences	19 Nov
Graduation	12 – 13 Dec

TIMETABLE

The timetable is online at www.victoria.ac.nz/timetables/

School of Biological Sciences Te Kura Mātauranga Koiora

School: School of Biological Sciences
Te Kura Mātauranga Koiora
Location: 5th Floor, Kirk Building, Kelburn Parade
Telephone: 0-4-463 5339 or 0-4-463 5747 or 0800 22 77 55
Fax: 0-4-463 5331
Email: biosci@vuw.ac.nz
Website: www.victoria.ac.nz/sbs

STAFF CONTACTS

STAFF		ROOM	CONTACT
Head of School:	A/Prof Phil Lester	KK505	463 5096
Deputy Head of School	A/Prof Simon Davy	KK726	463 5573
Postgraduate Programme Coordinators:			
Biomedical Science	Prof John Miller	AM307	463 6082
	Dr Bronwyn Kivell	KK605	
Biotechnology	Dr David Ackerley	KK804	463 5576
Cell & Molecular	Prof John Miller	AM307	463 6082
Biosciences	Dr Bronwyn Kivell	KK605	463 5233 ext 8336
Clinical Research	Prof Elaine Dennison	AM323	463 5233 ext 8136
Conservation Biology	Dr Nicola Nelson	KK621	463 5435
Diploma Clinical Research	Dr Jeremy Krebs	CCHBD	806 2140
Ecology & Biodiversity	Prof Kevin Gould	KK724	463 6649
Ecological Restoration	Dr Heiko Wittmer	KK618	463 7432
Marine Biology & Conservation	A/Prof Simon Davy	KK726	463 5573
Master of Marine Conservation	Dr James Bell	KK722	463 5233 ext 8104
Molecular Microbiology	Dr Ronan O'Toole	KK803	463 6088

ACADEMIC STAFF	RESEARCH AREAS	ROOM	CONTACT
Professors:			
Fred Allendorf	<i>Conservation Genetics</i>	KK803A	463 5277
Paul Atkinson	<i>Chemical Genetics</i>	AM322	463 7444
Elaine Dennison	<i>Clinical Research</i>	AM 323	463 5233 ext 8136
Alan Dixson	<i>Reproduction, Evolution & Behaviour</i>	KK516A	463 6090
Jonathan Gardner	<i>Marine Biology, Ecology, Genetics, Conservation</i>	KK805	463 5574
Kevin Gould	<i>Plant Ecophysiology</i>	KK724	463 6649
Ken McNatty	<i>Reproductive Biology</i>	KK615	463 6029
John Miller	<i>Cell Biology & Physiology</i>	AM307	463 6082
Associate Professors:			
Ben Bell	<i>Ecology, Behaviour & Conservation</i>	KK709	463 5570
Simon Davy	<i>Marine Symbiosis & Coral Reef Biology</i>	KK726	463 5573
Doug Eckery	<i>Reproductive Biology</i>	KK616	463 5171
Bill Jordan	<i>Biochemistry & Molecular Pathology</i>	AM303	4636092
Anne La Flamme	<i>Immunology & Cell Biology</i>	AM306	463 6093
Phil Lester	<i>Insect Ecology</i>	KK505	463 5096
Jeff Shima	<i>Marine Ecology & Fish Biology</i>	KK610	463 6494
Paul Teesdale-Spittle	<i>Biochemistry & Pharmacology</i>	AM308	463 6094
Senior Lecturers:			
David Ackerley	<i>Biotechnology</i>	KK804	463 5576
James Bell	<i>Marine Biology</i>	KK722	463 5233 ext 8104
Kevin Burns	<i>Community Ecology & Biogeography</i>	KK623	463 6873
Darren Day	<i>Biochemistry, Molecular Biology</i>	KK802	463 6087
Stephen Hartley	<i>Conservation Biology</i>	KK620	463 5447
Ian Hermans	<i>Vaccine Research</i>	MIMR	903 3043
Bronwyn Kivell	<i>Physiology & Neurobiology</i>	KK605	463 5233 ext 8336
Wayne Linklater	<i>Wildlife Biology</i>	KK617	463 5233 ext 88575
Nicola Nelson	<i>Conservation Biology</i>	KK621	463 5435
Ronan O'Toole	<i>Molecular Microbiology & Tuberculosis</i>	KK803	463 6088
Nicole Phillips	<i>Marine Ecology & Larval Biology</i>	KK723	463 5233 ext 8049
Postgraduate Coordinator			
Peter Ritchie	<i>Evolutionary Genetics</i>	KK622	463 5233 ext 88105
Ken Ryan	<i>Antarctic Biology & Ecophysiology</i>	KK725	463 6083
Heiko Wittmer	<i>Conservation & Restoration Ecology</i>	KK618	463 7432
Joe Zuccarello	<i>Molecular Biology & Phycology</i>	KK619	463 6414
Lecturers:			
Lifeng Peng	<i>Proteomics</i>	AM302	463 5233 ext 8076
Diane Ormsby	<i>Reproductive & Developmental Biology</i>	KK516A	463 5271
Adjunct Staff at The Malaghan Institute of Medical Research (MIMR)			
Prof Graham Le Gros, Director	<i>Asthma and Allergic Diseases</i>	MIMR	499 6914
Prof Mike Berridge	<i>Cancer Cell and Molecular Biology</i>	MIMR	499 6914
Prof Franca Ronchese	<i>Immune Cell Biology</i>	MIMR	499 6914
Dr Ian Hermans	<i>Vaccine Research</i>	MIMR	499 6914

ACADEMIC STAFF	RESEARCH AREAS	ROOM	CONTACT
Dr Joanna Kirman	<i>Infectious Diseases</i>	MIMR	499 6914
Dr Jacquie Harper	<i>Arthritis and Inflammation</i>	MIMR	499 6914
Dr Melanie McConnell	<i>Cell Survival</i>	MIMR	499 6914
Dr Troels Petersen	<i>Tumour Immunology</i>	MIMR	499 6914

Adjunct Academic staff at the Capital & Coast District Health Board and Medical Research Institute of NZ

Prof Richard Beaseley	<i>Clinical Research</i>	CCDHB	805 0238
Prof Timothy Blackmore	<i>Infectious Diseases Physician & Microbiologist</i>	CCDHB	918 6834
Dr Dorothy Dinesh	<i>Haematology</i>	CCDHB	380 2257
Prof Sinead Donnelly	<i>Palliative Medicine</i>	CCDHB	
Prof Alexander Garden	<i>Patient Safety</i>	CCDHB	
Prof Scott Harding	<i>Cardiology and Vascular Immunology</i>	CCDHB	
Prof Shaun Holt	<i>Evidence-Based Medicine</i>	CCDHB	
Dr Jeremy Krebs	<i>Endocrinology</i>	CCDHB	
Dr Julia Phillips	<i>Haematology & Anaemia</i>	CCDHB	
Dr Alexander Sasse	<i>Cardiology & Stem Cell Therapy</i>	CCDHB	

Senior Teaching Fellows:

Geoff Chambers	<i>Molecular Biology & Evolution</i>	KK806	463 6091
Alan Clark	<i>Biochemistry, enzymology, Toxicology</i>	AM309	463 5571
George Gibbs	<i>Entomology, Biogeography</i>	KK418	463 6084
Jim McIntosh	<i>Physiology</i>	AM309	463 5577
Geoff Rickards	<i>Genetics</i>	KK418	463 6084
Murray Williams	<i>Conservation Biology</i>	KK418	463 6084

Emeritus Professors:

Phil Garnock-Jones	<i>Plant Taxonomy, Phylogeny & Evolution</i>	KK419	463 6085
John Wells	<i>Taxonomy of Copepoda</i>	KK514	463 5324

Administrative Staff

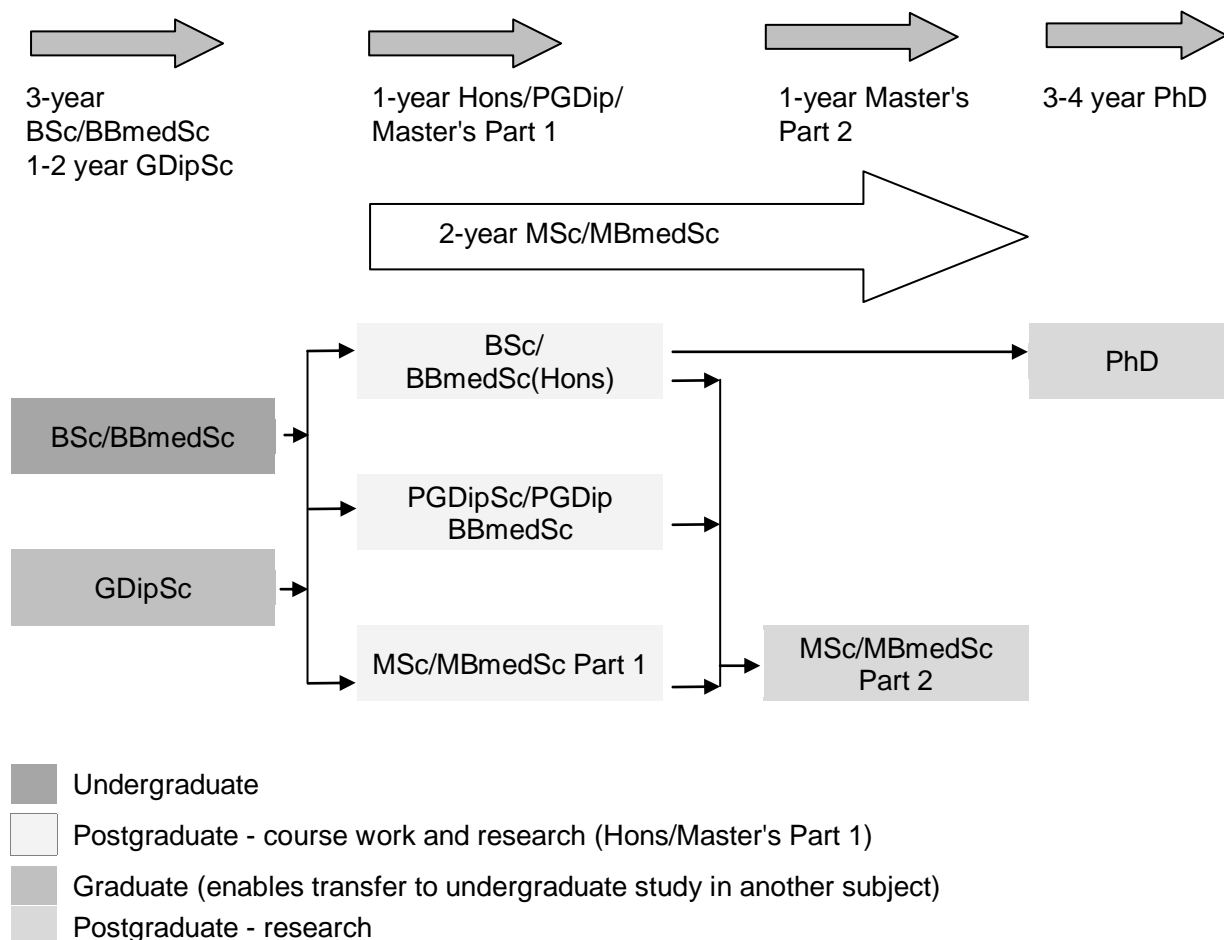
Lesley Thompson	School Manager	KK506	463 5332
Delwyn Carter-Jarratt	Administrator	KK516	463 5207
Paul Marsden	Operations / Finance	KK516	463 5555
Mary Murray	Administrator	KK507	463 5339
Sandra Taylor	Administrator (Graduate programmes)	KK516	463 5747

Technical Staff

Alan Hoverd	Team Leader	KK503	463 5579
Chris Thorn	Coordinator – Teaching Laboratories	KK704	ext 8240
Monica Awasthy	Technical Officer	KK704	ext 8240
Richard Crerar	Technical officer	KK420	463 5580
Craig Doney	Equipment Officer	KK404	463 5154
Angela Fleming	Technical Officer	KK704	ext 8240
Derek Heath	Technical Officer	KK420	463 5580
Neville Higgison	Equipment Officer	KK404	463 5154
Sue Keall	Senior Technical Officer	KK514	463 5324
Danyl McLauchlan	Proteomics IT Specialist	AM301	463 5735
Daniel McNaughtan	Technical Officer - VUCEL	CEL101	470 9257
Dr Lesley Milicich	Technical Officer	KK510	ext 8121
Adrian Pike	Technical Officer	KK420	463 5580
Sushila Pillai	Technical Officer	KK420	463 5580
Tristram Price	Equipment Officer	KK404	463 5154
John van der Sman	Technical Officer - VUCEL	CEL101	470 9250

QUALIFICATIONS AVAILABLE

Postgraduate degrees follow on from undergraduate degrees (such as BSc or BBmedSc). Postgraduate degrees are designed for specialised study in a field and provide training in research methods, the scientific process, critical evaluation of published research, and further study in selected topics. Students need to be much more independent than as an undergraduate, and a high degree of collegiality and contribution to the academic life of the School is expected. The diagram below represents the structure of postgraduate study in science.



BACHELOR WITH HONOURS

The prerequisite is a degree in the chosen field, and our minimum internal requirement for acceptance is generally an average B+ grade in relevant 300 level courses. The degree is normally undertaken over 2 semesters and involves 120 points of study, 30 of which come from a research project and requires submission of a thesis.

The school offers programmes as part of the BSc (Hons) with majors in Biotechnology, Cell & Molecular Bioscience, Conservation Biology, Ecology & Biodiversity, Marine Biology and Molecular Microbiology, and a specialist Honours programme in Biomedical Science.

MASTERS

The prerequisite is a degree in the chosen field, and our minimum internal requirement for acceptance is generally an average B+ grade in relevant 300 level courses. The degree is normally undertaken over 2 years (Part 1 and 2). Part 1 involves 3 courses worth equal marks, plus a research preparation course. Part 2 is full time research. Entry to Part 2 is not automatic but contingent on performance in Part 1. When the Masters programme is made up of both Parts 1 & 2, the degree is awarded with Honours. Students with an existing qualification equivalent to Honours may enter directly into Part 2. Under these circumstances the Masters degree is graded Pass, Merit or Distinction and is awarded without Honours. You must have a thesis topic and an agreed supervisor before you can enrol.

The School offers Masters programmes as part of the Master of Science (MSc) with majors in Biotechnology, Cell & Molecular Bioscience, Conservation Biology, Ecological Restoration, Ecology & Biodiversity, Marine Biology and Molecular Microbiology, and specialist taught masters programmes in Biomedical Science, Clinical Research, Conservation Biology and Marine Conservation.

DIPLOMAS AND CERTIFICATES

The School also offers Graduate Diploma in Science (GradDipSc), Postgraduate Certificate in Science (PGCertSc), Postgraduate Diploma in Science (PGDipSc) and Postgraduate Certificates in Marine Conservation and New Zealand Conservation.

HOW DO I JOIN THE POSTGRADUATE PROGRAMME?

Read the prospectus, and then discuss your interests and options with staff members in the disciplines you're interested in. They'll suggest research topics if applicable (or you can discuss your own ideas with them) and advise you on the courses you should consider taking. Then complete the form at the back of the Postgraduate Prospectus and hand it to the postgraduate advisor for your subject. **This process is not a substitute for formal pre-enrolment, but we'll notify you if you are provisionally accepted before you have to confirm your enrolment.** Some students might find themselves wait-listed while the places are being confirmed. In Ecology & Biodiversity and Marine Biology, you will be wise to plan early because some projects will require summer fieldwork or have seasonal requirements.

MASTERS OR HONOURS

An Honours degree is intensive and can be stressful. On the other hand it's quick. A good grade in a BSc (Hons) may allow you access to PhD programmes in many institutions in

countries including New Zealand and Australia (please note universities in some countries require an MSc for entrance into PhD programmes).

Masters of Science involves a much larger research component than the BSc (Hons). With the full-year thesis it's recognised as a research degree, and Masters graduates are likely to have acquired more technical skills. The first year is equal to BSc (Hons) because it includes a 30 point course Preparation for Research, which includes assessed tasks such as a thesis proposal, literature survey, pilot studies, and draft of thesis introduction. But you'll pay two years' fees, so it will cost more.

POSTGRADUATE CERTIFICATE IN SCIENCE

This is a postgraduate programme that can permit the completion of postgraduate study in a focussed area within an achievable timeframe while in fulltime work or managing other commitments. The PGCertSc can also provide an earlier exit point from a MSc or BSc(Hons) programme. The PGCertSc:

- Consists of 1 trimester fulltime or up to 2 years part-time
- Usually consists of all course work (60 points) at PG level
- Usually requires a B grade average in related 300-level subjects for admission
- Is endorsed in a subject offered for the MSc degree
- Can be abandoned for a PGDipSc with 60 further approved points.

POSTGRADUATE DIPLOMA IN SCIENCE

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. The programme:

- Consists of 1 year fulltime or up to 4 years part-time
- Usually consists of all course work (120 points) at PG 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.

POSTGRADUATE DIPLOMA IN CLINICAL RESEARCH

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 Capital and Coast District Health Board and other medically related organizations in the Wellington area, and the teaching staff includes clinicians. The programme:

- Consists of 1 year full time or up to 4 years part time (currently only offered part time)
- Consists of all course work (120 points) at Postgraduate level
- Requires a relevant bachelor's degree and/or professional experience for admission

Courses offered in Postgraduate Diploma of Clinical Research:

CLNR 401 Introduction to Clinical Research and Clinical Trial Practice	15 points
CLNR 402 Ethics and Research in Special Populations as applied to Clinical Research	15 points
CLNR 403 Biostatistics and Informatics	15 points
CLNR 404 Qualitative Methods in Clinical Research	15 points
CLNR 405 Advanced Clinical Research Design, Management and Analysis	30 points
CLNR 580 Research Preparation	30 points

MASTERS IN CLINICAL RESEARCH

Applicants for the MClinRes will in general have completed the PGDipClinRes or an equivalent qualification to an appropriate academic standard. Some applicants with significant and relevant clinical research experience may be permitted to gain direct entry to the MClinRes without completing the PGDipClinRes. The MClinRes will in many cases lead to a PhD in clinical research, or direct entry into the workforce and enhanced career advancement in clinical research:

CLNR 591 Masters Thesis in Clinical Research	120 points
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For more information see: www.victoria.ac.nz/sbs/study/postgraduate-study/clinical-res.aspx

HONOURS AND MASTERS

Honours degrees are awarded with first, second class (first division), second class (second division), or third class honours. Lecturers may assign provisional grades for individual pieces of work during the year. In addition to posting a final class of honours at the end of the year, letter grades (A+, A, A-, B+, B, B-, C+, C, D, E) will be posted for particular courses. "A" grades correspond to first class work; "B+" and higher "B" to second class (first division); lower "B" and "B-" to second class(second division) work; and "C" to third class work.

The award of a class honours is based upon overall assessment of the calibre of work done across all the courses taken. The final assessment is arrived at by the School in consultation with external examiners.

Those students who have an Honours degree and take an MSc PART 2 only can have it awarded with distinction (A+ to A grade work) or merit (A- to B+ grade work).

The courses are all seminar based and dates, times, and venues will generally be as indicated in the University timetable. Students should be aware that special meetings or arrangements may occur. All theory-based courses in the School of Biological Sciences will be run in semesters and will be either internally assessed (BMSC 403-406, BTEC 436) or with examinations (all other courses) held at the end of each course. Where not stated below, these will be advised as soon as possible. Honours students need to enrol in 489 (Research Project) rather than 580 (Research Preparation for Masters).

It is possible to substitute optional courses in graduate programmes with courses from other subjects within the following restrictions: not more than half of the required courses for the programme are substituted; substitute courses are complementary and relevant to the programme; that no regulations of the VUW Calendar are broken in so doing. Permission of the Head of School is needed for substitution of courses.

BIOMEDICAL SCIENCE

The prerequisite is usually a BBMedSc degree in the chosen field.

ENTRY REQUIREMENTS

Requirement for acceptance is an average B+ grade in relevant 300 level courses.

BACHELOR OF BIOMEDICAL SCIENCE WITH HONOURS

The degree is normally undertaken over two semesters and involves four courses all worth equal marks, one of which is a research project.

The personal course of study shall include:

- Two courses chosen from BMSC 403 - 406 (30 points)
- Two courses chosen from BMSC 430, 431, 432, and 433, (60 points)
- A research project (BMSC 489).

Substitution of up to two courses from the BSc (Hons) schedule (or an approved equivalent qualification) is permissible. Substitutions from subject areas such as chemistry or microbiology are worthy of consideration.

MASTER OF BIOMEDICAL SCIENCE

The Masters degree is normally undertaken over two years (Parts I and II). Part I involves three theoretical courses worth equal marks and a research preparation course; Part II consists of a research thesis. Students with an existing qualification equivalent to Honours may enter directly into Part II. Under these circumstances the Masters degree is graded Pass, Merit or Distinction and is awarded without Honours. You must have a thesis topic and an agreed supervisor before you can enrol.

Part 1: The personal course of study shall include:

- Two courses chosen from BMSC 403 - 406
- Two further courses chosen from the schedule of courses for BBmedSc (Hons) plus BMSC 580 Research Preparation.

Substitution of up to two courses from the BSc (Hons) schedule (or an approved equivalent qualification) is permissible.

Part 2: BMSC 591 (thesis): The Masters degree in biomedical science part 2 involves a year of full-time work on a research topic in biomedical science. Students must have the equivalent of a BMSC (Hons) degree with research experience before enrolling in the course. Research areas are listed under individual staff interests, and enrolment is only possible after an academic staff member has agreed to act as primary supervisor for the student. The course is completed on submission and successful examination of a thesis describing the research undertaken.

POSTGRADUATE DIPLOMA IN MEDICAL SCIENCE

Before enrolment, a candidate shall have completed a BBmedSc degree or equivalent Bachelor's degree. The personal course of study shall consist of 120 points from BMSC 401-489, 580, including 30 points from BMSC 403-406

BIOTECHNOLOGY

The minimum internal requirement for acceptance is an average B+ grade in relevant 300 level courses.

ENTRY REQUIREMENTS

The entry requirements are as follows:

- BTEC 301, TECH 302
- At least 30 points from BIOL/BMSC 339, 340, 343, 354, CHEM 305 or 306 (or equivalent courses subject to approval).

BIOTECHNOLOGY FOR BSc WITH HONOURS

Course requirements are as follows:

- BTEC 489, 435
- 75 points from courses BTEC 401-479, BIOL, CHEM or MBIO 400-480 to include at least 15 points from BTEC 401-479.
- BTEC 436 strongly recommended.

Substitution of up to two courses from the BSc (Hons) schedule may be made with approval from the Head of School.

BIOTECHNOLOGY FOR MSc

Part 1 consists of:

- BTEC 580, 435
- 75 points from courses BTEC 401-479, BIOL, CHEM or MBIO 400-480 to include at least 15 points from BTEC 401 - 479.

Part 2: BTEC 591 (thesis)

BIOTECHNOLOGY FOR PGDipSc

Course requirements: 120 points from BTEC 401-489, 580 BIOL, CHEM or MBIO 400-480, to include at least 30 points from BTEC 401-479.

CELL AND MOLECULAR BIOSCIENCE

The minimum internal requirement for acceptance is an average B+ grade in relevant 300 level courses. As in the BBmedSc (Hons), substitution of up to two courses from the BSc(Hons) schedule may be made with approval from the Head of School.

ENTRY REQUIREMENTS

You need at least 60 points from BIOL 334, 335, 339, 340, 343 (or an approved combination of 300-level BMSC courses).

CELL & MOLECULAR BIOSCIENCE FOR BSc WITH HONOURS

Course requirements are as follows:

- CBIO 489
- 90 points in an approved combination from BIOL 430- 440.

CELL & MOLECULAR BIOSCIENCE FOR MSc

Part 1 consists of:

- CBIO 580
- 90 points in an approved combination from BIOL 403- 440.

Part 2: CBIO 591 (thesis)

CELL & MOLECULAR BIOSCIENCE FOR PGDipSc

Course requirements: 120 points from BIOL 430- 440, CBIO 489, 580.

CONSERVATION BIOLOGY

The minimum internal requirement for acceptance is an average B+ grade in relevant 300 level courses.

ENTRY REQUIREMENTS

60 points in approved BIOL courses numbered 300-399, STAT 193 or equivalent.

CONSERVATION BIOLOGY FOR BSc WITH HONOURS

Course requirements are as follows:

- BIOL 420
- 60 points in an approved combination from BIOL 403, 422-426, ERES 525 in an approved combination
- Research project (CONB 489).

With permission of the Head of School an approved course may be substituted for one of BIOL 403, 422-426.

CONSERVATION BIOLOGY FOR MSc

Conservation Biology is a standard MSc comprised of 120 points of course work (part 1), followed by a year-long project leading to a thesis (part 2).

Part 1 consists of:

- BIOL 580, BIOL 420
- 60 points in an approved combination from BIOL 403, 422-426, ERES 525.

Part 2: CONB 591 (thesis)

CONSERVATION BIOLOGY FOR PGDipSc

Course requirements are as follows:

- BIOL 420
- 90 points in an approved combination from BIOL 403, 422-426, ERES 525.

MASTER OF CONSERVATION BIOLOGY (MConBio)

Entry requirements: A bachelor's degree in a biological or other relevant discipline or approval of the Associate Dean (Students). Our minimum requirement for acceptance is an average B+ grade in relevant 300-level courses. The deadline for application is Oct 15th in the year preceding the VUW component.

Course requirements: The Master of Conservation Biology is a one-year taught professional degree. It is taught half at Victoria University of Wellington (VUW) and half at the University of New South Wales (UNSW, Sydney, Australia). Students may begin studies at either

university, VUW at the beginning of the calendar year, or UNSW at mid-year. Post-grad certificate students complete the VUW part only.

Part 1 Three courses at Victoria University of Wellington (January – June): BIOL 420 Conservation Ecology; BIOL 424 New Zealand Conservation Practice; one further course chosen from BIOL 422-426, ENVI 505, ERES 525, or another course approved by the Head of School of Biological Sciences.

Part 2 A course of study at UNSW (Sydney, Australia) (July – December) complementary in content to that in Part 1

For more information go to our website:

www.victoria.ac.nz/sbs/study/postgraduate-study/specialist-masters-programmes/mcon-bio/default.aspx

POSTGRADUATE CERTIFICATE IN NEW ZEALAND CONSERVATION

The programme requires:

- BIOL 420, 424
- 30 points from BIOL 422-426, ENVI 505, ERES 525 or another approved course (i.e. Part 1 of the MConBio).

ECOLOGICAL RESTORATION

The minimum internal requirement for acceptance is an average B+ grade in relevant 300 level courses.

ENTRY REQUIREMENTS

60 points in approved BIOL courses numbered 300-399 and STAT 193 or equivalent.

MASTER OF SCIENCE IN ECOLOGICAL RESTORATION

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

Entry requirements: An average B+ grade in relevant 300-level courses or approval of the Head of School.

Part 1 consists of:

- ERES 580, ERES 525
- 60 points in an approved combination from BIOL 403, 419, 421-426, ENVI 504-529, ERES 526 or another course approved by the Head of School.

Part 2: ERES 591 (thesis)

ECOLOGICAL RESTORATION FOR PGDipSc

The programme requires:

- ERES 525
- 90 points in an approved combination from BIOL 403, 421-426, ENVI 504-529, ERES 526 or another course approved by the Head of School.

ECOLOGY AND BIODIVERSITY

The minimum internal requirement for acceptance is an average B+ grade in relevant 300 level courses.

ENTRY REQUIREMENTS

60 points in approved BIOL courses numbered 300-399; STAT 193 or equivalent.

ECOLOGY AND BIODIVERSITY FOR BSc WITH HONOURS

The course requirements are:

- BIOL 489, 403, 422
- 30 points from BIOL 419, 420, 423, 425, 426 (b).

With permission of the Head of School, one of BIOL 427, 428, 430, 440 may be substituted for one course from (b).

ECOLOGY AND BIODIVERSITY FOR MSc

Part 1 consists of:

- BIOL 580, 403, 422
- 30 points from BIOL 419, 420, 423, 425, 426 (b).

With permission of the Head of School, one of BIOL 427, 428, 430, 440 may be substituted for one course from (b).

Part 2: EBIO 591 (thesis)

ECOLOGY AND BIODIVERSITY FOR PGDipSc

Course requirements: 120 points from BIOL 403, 419-423, 425-428, 430, 440, 489, and 580.

MARINE BIOLOGY

The minimum internal requirement for acceptance is an average B+ grade in relevant 300 level courses.

ENTRY REQUIREMENTS

60 points in approved BIOL courses numbered 300-399; STAT 193 or equivalent.

MARINE BIOLOGY FOR BSc WITH HONOURS

The programme consists of:

- BIOL 423, BMAR 489
- 60 points from BIOL 403, 419-422, 424-429, ERES 525 in an approved combination

With the permission of the Head of School, BIOL 430 or 440 may be substituted for one of BIOL 403, 419 - 422, 424 – 429, ERES 525

MARINE BIOLOGY FOR MSc

Part 1 consists of:

- BIOL 423, BIOL 580
- 60 points from BIOL 403, 419-422, 424-429, 430, 440, ERES 525 in an approved combination

With the permission of the Head of School, BIOL 430 or 440 may be substituted for one of BIOL 403, 419 - 422, 424 – 429, ERES 525

Part 2: BMAR 591 (thesis)

MARINE BIOLOGY FOR PGDipSc

The programme consists of:

- BIOL 423
- 90 points from BIOL 403, 419-422, 425-428, 430, 440, ERES 525 in an approved combination

With the permission of the Head of School, BIOL 430 or 440 may be substituted for one of BIOL 403, 419-422, 425–428, ERES 525

MASTER OF MARINE CONSERVATION

The prerequisite is a BSc or equivalent degree in an appropriate subject, and our **minimum** internal requirement for acceptance is an average B+ grade in relevant 300-level courses. The Master of Marine Conservation is an 18-month taught professional degree, though students who already possess an Honours degree or at least 6 months full-time relevant work experience can complete the qualification in 12 months; these students must complete Parts 1 & 2 (see below). Students can begin the programme either in January or June.

Part 1 (January-June): BIOL 424 and 60 further points from BIOL 420, 422-425, 427, 428, 440, ERES 525, ENVI 505, MAOR 411

Part 2 (June-December): BIOL 419 and 429, and 30 further points from BIOL 403, 426, 429, 440, BMAR 580, ERES 526, ENVI 506, MAOR 409, PASI 402-403

Part 3 (January-June): 60 further points from BIOL 420, 422-425, 427, 428, 440, ERES 525, ENVI 505, MAOR 411

ENTRY REQUIREMENTS

The entry requirements are a bachelor's degree in a biological or other relevant discipline or approval of the Associate Dean (Students). Our **minimum** requirement for acceptance is an average B+ grade in relevant 300-level courses.

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 419, 424 and 429. The certificate is usually completed in six months (full-time) or twelve months (part-time).

MOLECULAR MICROBIOLOGY

Molecular Microbiology is at the forefront of developments in the biosciences. It addresses some of the most pressing biological needs of mankind including the discovery of new medicines to prevent and treat infectious diseases. It examines microbes at the cellular and community levels in a range of environments including humans. It aims to define the molecular basis for important processes such as host-pathogen interactions, antibiotic resistance, and cell-cell communication. Whole genome sequencing has facilitated the identification of stages in the life cycle of microbes that can be targeted with respect to advancing human health or biotechnologies. The School of Biological Sciences, together with its partner research institutes, offers BSc (Hons), MSc and PhD degrees in Molecular Microbiology

ENTRY REQUIREMENTS

The minimum internal requirement for acceptance is an average B+ grade in the relevant 300-level courses including BMSC 301 or equivalent.

MOLECULAR MICROBIOLOGY FOR BSc WITH HONOURS

The programme consists of:

- BIOL 430, MBIO 434, 489
- 30 points from BIOL 400-429, 431-439, BMSC 403 - 406, BTEC 435, 436, MBIO 440.

MOLECULAR MICROBIOLOGY FOR MSc

Part 1 consists of:

- BIOL 430, MBIO 434, 580
- 30 points from BIOL 400-429, 431-439, BMSC 403 - 406, BTEC 435, 436, MBIO 440.

Part 2: MBIO 591 (thesis)

PLANNING A PROGRAMME

Select your programme from the following 400 and 500-level courses.

Course information index

Course code	Course reference number	Title	Points	Trimester
↓	↓	↓		↓
BIOL 403	CRN 588	EVOLUTION	30 POINTS	[1/3]

400 & 500-LEVEL COURSES

BIOL 403	CRN 588	EVOLUTION	30 POINTS	[2/3]
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Coordinators: Dr Peter Ritchie, Dr Joe Zuccarello

Prerequisites: BIOL 329 or equivalent to the satisfaction of the Head of School.

The course focuses on the fundamental ideas in evolution and covers a wide range of subject areas including population genetics, phylogenetic reconstruction, speciation processes and adaptation. There is focus on both the theory and the practise of evolutionary biology, with an emphasis on DNA sequence analysis and using these types of data to interpret the patterns and processes of evolution.

BIOL 419	CRN 15159	PRINCIPLES OF MARINE CONSERVATION	30 POINTS	[2/3]
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Coordinator: Dr James Bell

Prerequisites: A minimum of 60 points from 300-level marine biology, ecology or environmental studies or permission of the Head of the School

This courses focuses 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 bio-resources, including fisheries ecology; bio-invasions and disease; global climate change; marine reserve ecology; and scenario planning.

BIOL 420	CRN 5036	CONSERVATION ECOLOGY	30 POINTS	[1/3]
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Coordinators: Dr Wayne Linklater, Dr Stephen Hartley
 Prerequisites: 300-level ecology or approval of the Head of School.

Ecological theory, principles and practice relating to biological conservation. A selection of prescribed and optional ecological topics in conservation including island biogeography and nature reserves, sex and mating systems, species harvesting and utilisation, determining priorities, invasion risk and ecosystem threats, conservation genetics, landscape and urban ecology, ecological evaluation and services, species ecology, management and conservation.

BIOL 422	CRN 9586	ECOLOGY	30 POINTS	[1/3]
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Coordinator: Dr Nicole Phillips
 Prerequisites: 300-level ecology or approval of the Head of School.

In this course we will evaluate 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 BIOLOGY	30 POINTS	[1/3]
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Coordinators: Dr Simon Davy, Dr James Bell

Discussion and critical evaluation of current research topics in marine biology, including marine diversity and ecology, and the physiology of marine organisms.

BIOL 424	CRN 9629	NEW ZEALAND CONSERVATION PRACTICE	30 POINTS	[1/3]
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Coordinator: Dr Nicola Nelson
 Prerequisites: 300-level ecology or approval of the Head of School.

A practical and field based course in New Zealand's terrestrial and marine flora and fauna and its conservation. In consultation with professional, governmental and nongovernmental organisations we aim to provide an understanding of the practical processes of conservation biology in New Zealand. The course will focus around fieldtrips in late January-February to different conservation sites around New Zealand. The topics we cover will include the role of the Treaty of Waitangi in New Zealand conservation, invasive species, endangered species, commercial use of conservation resources, land use issues, mainland islands and island conservation.

There is a course charge to pay for expenses incurred in the field. This covers transport, accommodation, food etc. Please notify Dr Nelson as early as possible if you are interested in doing this course. **Applications close 15 October 2011 for enrolment in this course.**

BIOL 425	CRN 13573	BIODIVERSITY	30 POINTS	[1/3]
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Coordinators: Dr Phil Lester, Prof Phil Garnock-Jones
 Prerequisites: BIOL 329 or approval of the Head of School

Biodiversity is about the variety and richness of living things in the world. It has both ecological and systematics strands. We will provide a comprehensive introduction to issues surrounding biodiversity, an introduction to current research in the area with a detailed examination of case studies. Key topics covered in the course include classification systems and inventories of biodiversity, mechanisms associated with the generation of biodiversity, the role of biodiversity in the functioning of ecological systems, and the consequence of human activities on biodiversity.

BIOL 426	CRN 13574	BEHAVIOURAL ECOLOGY	30 POINTS	[2/3]
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Coordinators: Dr KC Burns, Dr Ben Bell
 Prerequisites: BIOL 328

A supervised programme of study in behavioural ecology. Students will become involved in the collection, analysis and write-up of a project in animal behaviour - for instance, projects in recent years examined bird behaviour (foraging, bioacoustics), mostly in the Karori Wildlife Sanctuary.

Tutorial sessions will involve literature review and methodology associated with the field project. Experimental and/or comparative approaches will be encouraged.

BIOL 427	CRN 13575	SPECIAL TOPIC: CURRENT ISSUES IN MARINE SCIENCE	15 POINTS	[1/3]
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Coordinator: Prof Jonathan Gardner
 Prerequisites: 300-level ecology or approval of the Head of School.
 Corequisite: BIOL428

A seminar-based examination of selected current issues in Marine Science.

Seminars will be jointly run using the KAREN computer network link between the Universities of Auckland, Otago and Victoria. The topics and material will recognize the wide range of experience of the participants and emphasise the value of cross- disciplinary approaches to marine science (not just marine biology).

BIOL 428	CRN 13576	SPECIAL TOPIC: FIELD MARINE SCIENCE	15 POINTS	[1/3]
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Coordinator: Prof Jonathan Gardner
 Prerequisites: 300-level ecology or approval of the Head of School.
 Corequisite: BIOL 427

An advanced course in the development of practical skills in research design, implementation and analysis in Marine Science. Students will participate in two field components: one compulsory unit based at Victoria University, the other unit to be chosen from those offered by Otago or Auckland universities. The three field components will each focus on a different theme in Marine Science. Each field course is one week in duration and is scheduled out of normal teaching time. In 2012 this will be the third week of February for VUW, the week immediately after Easter Sunday for Otago, and mid/late June for Auckland.

BIOL 429	CRN 15160	TROPICAL MARINE CONSERVATION PRACTICE	30 POINTS	[2/3]
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Coordinator: Dr Simon Davy
 Prerequisites: Enrolment in PGCertMarCon, MMarCon or MSc in Marine Biology or permission of the Head of School. **Students should notify the course co-ordinator of their intention to enrol by March 1st 2012.**

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 with the assistance from the University of Queensland, and based at Moreton Bay and Heron Island Research Stations.

BIOL 430	CRN 9228	GENETICS AND MOLECULAR BIOLOGY	30 POINTS	[2/3]
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Coordinators: Prof Paul Atkinson
 Prerequisites: 45 points from BIOL 334-343 or an approved combination of 300-level BMSC courses, with an average grade of at least a B+ for 45 points at 300-level, or permission of the Head of the School.
 Restrictions: BIOL 401, BCHM 403 , BMSC 430

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

BIOL 431	CRN 9229	CELL BIOLOGY	30 POINTS	[2/3]
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<p>Coordinators:</p> <p>Prerequisites:</p> <p>Restrictions:</p>	<p>Dr Bill Jordan,</p> <p>45 points from BIOL 334–343 or an approved combination of 300-level BMSC courses, with an average grade of at least a B+ for 45 points at 300-level, or permission of the Head of the School.</p> <p>BIOL 406, BMSC 431. A minimum requirement for entry into the course is an average B+ grade in the relevant 300 level courses</p>
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Advances in cellular structure, function and behaviour including aspects of developmental biology.

See details for equivalently numbered BMSC courses.

BIOL 432	CRN 9230	PHYSIOLOGY AND PHARMACOLOGY	30 POINTS	[1/3]
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<p>Coordinators:</p> <p>Prerequisites:</p> <p>Restrictions:</p>	<p>Prof John H. Miller, Dr Paul Teesdale-Spittle</p> <p>45 points from BIOL 334-343 or an approved combination of 300-level BMSC courses, with an average grade of at least a B+ for 45 points at 300-level, or permission of the Head of the School.</p> <p>BIOL 407, BMSC 432, PHSI 405</p>
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Advances in physiological and pharmacological sciences at the molecular, cellular and organismal levels, including integrative physiology of organ systems, the mechanistics of drug interactions with biological systems, pharmacokinetics and the structural design, targeting and biological reactivity of molecular probes and drugs.

BIOL 433	CRN 9231	HUMAN AND CLINICAL BIOCHEMISTRY	30 POINTS	[1/3]
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<p>Coordinators:</p> <p>Prerequisites:</p> <p>Restrictions:</p>	<p>Dr Darren Day,</p> <p>45 points from BIOL 334-343 or an approved combination of 300-level BMSC courses, with an average grade of at least a B+ for 45 points at 300-level, or permission of the Head of the School.</p> <p>BCHM 404, BMSC 433</p>
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Cellular and molecular biochemistry of normal and pathological cell function with an emphasis on human disease processes and therapeutic treatments.

BIOL 440 CRN	COURSE DIRECTED INDIVIDUAL STUDY	30 POINTS	[1+2/3]
DEPENDENT			

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.

BIOL 580	CRN 17436	RESEARCH PREPARATION FULL YEAR	30 POINTS	
BIOL 580	CRN 17436	RESEARCH PREPARATION	30 POINTS	[1/3]
BIOL 580	CRN 7763	RESEARCH PREPARATION	30 POINTS	[1+2/3]
ERES 580	CRN 13738	RESEARCH PREPARATION	30 POINTS	

A course of study in preparation for a master's part 2 research programme. The course is to be no less than 300 hours study or research and to be agreed with the research supervisor (or postgraduate coordinator if the supervisor is not yet known). Typical activities could include undertaking preliminary research investigations, developing key practical or theoretical skills, undertaking in depth analysis of the literature or an existing dataset.

BIOL 489	CRN 3201	RESEARCH PROJECT	30 POINTS	[1+2/3]
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A research project on a topic approved by the Head of School.

BMAR 489	CRN 9579	RESEARCH PROJECT IN MARINE BIOLOGY	30 POINTS	[1+2/3]
EBIO 489	CRN 9580	RESEARCH PROJECT IN ECOLOGY AND BIODIVERSITY	30 POINTS	[1+2/3]

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

BMSC 403	CRN 18351	ADVANCED TOPICS IN BIOMEDICAL AND CLINICAL SCIENCE I	15POINTS	[1/3]
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Coordinator: Dr Anne La Flamme
 Prerequisites: 45 points from an approved combination of 300-level BMSC, BIOL, CHEM, PSYC courses or permission of Head of School

A detailed examination of selected topics in developing areas of clinical science and practice. In particular, the subjects covered may include such topics as immunology, epidemiology, or molecular therapeutics and shall include knowledge of current research activity in terms of theory and practice. This course will take place at the Wellington Hospital site.

BMSC 404	CRN 18506	ADVANCED TOPICS IN BIOMEDICAL AND CLINICAL SCIENCE II	15POINTS	[2/3]
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Coordinator: Dr Anne La Flamme
 Prerequisites: 45 points from an approved combination of 300-level BMSC, BIOL or CHEM courses.

A detailed examination of further selected topics in developing areas of clinical science and practice. 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 will take place at the Wellington Hospital site.

BMSC 405	CRN 19800	ADVANCED TOPICS IN BIOMEDICAL SCIENCE I	15 POINTS	[1/3]
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Coordinator: Dr Anne La Flamme
 Prerequisites: 45 points from an approved combination of 300-level BMSC, BIOL or CHEM courses.

A detailed examination of currently developing areas of major importance in biomedical science including but not limited to molecular pathology, vaccine immunology, and medicinal chemistry.

BMSC 406	CRN 19799	ADVANCED TOPICS IN BIOMEDICAL SCIENCE II	15 POINTS	[2/3]
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Coordinator: Dr Anne La Flamme
 Prerequisites: 45 points from an approved combination of 300-level BMSC, BIOL or CHEM courses.

A detailed examination of currently developing areas of major importance in biomedical science including but not limited to immunology, pathology, and ethics.

BMSC 430	CRN 9858	SEE DETAILS FOR EQUIVALENTLY	30 POINTS	[2]
BMSC 431	CRN 9859	NUMBERED BIOL COURSES ABOVE	30 POINTS	[2/3]
BMSC 432	CRN 9860		30 POINTS	[1/3]
BMSC 433	CRN 9861		30 POINTS	[1/3]

Coordinators: As for equivalently numbered BIOL courses

Prerequisites: 45 points from BIOL 334-343 or an approved combination of 300-level BMSC courses, with an average grade of at least a B+ for 45 points at 300-level, or permission of the Head of the School.

Restrictions: Equivalently numbered BIOL courses

BMSC 440	CRN 1003	DIRECTED INDIVIDUAL STUDY	30 POINTS	[1+2/3]
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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	RESEARCH PROJECT	30 POINTS	[1+2/3]
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Prerequisites: 60 points BIOL/BMSC 300-level courses involving a practical component or CHEM 305.

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

BTEC 435	CRN 15708	BIOTECHNOLOGY 1	15 POINTS	[1/3]
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Coordinator: Dr David Ackerley

Seminars introducing topics of current interest in biotechnology commercialisation and research.

BTEC 436	CRN 15709	BIOTECHNOLOGY 2 - BUSINESS DEVELOPMENT	15 POINTS	[2/3]
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Coordinator: Dr Paul Teesdale-Spittle

Evaluation of business strategic decision making and IP as applied within a biotechnology business context.

BTEC 440	CRN 15710	DIRECTED INDIVIDUAL STUDY IN BIOTECHNOLOGY	30 POINTS	[1+2/3]
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A supervised programme of study in biotechnology 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.

BTEC 441	CRN 15711/ 18016	DIRECTED INDIVIDUAL STUDY IN BIOTECHNOLOGY	15 POINTS	[1 OR 2/3]
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A supervised programme of study in biotechnology 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.

BTEC 489	CRN 15712	RESEARCH PROJECT	30 POINTS	[1+2/3]
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Prerequisites: BTEC 301 or equivalent.

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

CBIO 489	CRN 9276	RESEARCH PROJECT IN CELL & MOLECULAR BIOSCIENCE	30 POINTS	[1+2/3]
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A research project on a topic approved by the Head of School.

BIOL 580	CRN 7763	RESEARCH PREPARATION	30 POINTS	[2/3]
BTEC 580	CRN 15713	RESEARCH PREPARATION	30 POINTS	[1+2/3]
BMSC 580	CRN 9863	RESEARCH PREPARATION	30 POINTS	[1+2/3]
MBIO 580	CRN 13745	RESEARCH PREPARATION	30 POINTS	[1+2]

A course of study in preparation for a master's part 2 research programme. The course is to be no less than 300 hours study or research, and to be agreed with the research supervisor (or postgraduate coordinator if the supervisor is not yet known). Typical activities could include undertaking preliminary research investigations, developing key practical or theoretical skills, undertaking in depth analysis of the literature or an existing dataset.

ERES 525	CRN 13632	ECOLOGICAL RESTORATION	30 POINTS	[1/3]
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Coordinator: Dr Heiko Wittmer

Students are introduced to the main principles of restoration ecology and the science that supports the practice of ecological restoration, by examining academic journal literature and key text books. Focus is on conflicting philosophies that attempt to distinguish wild from restored Nature, valuation of Nature and ecological services, the development of restoration visions, key ecological community and population principles that support restoration practice, species introductions and invasions, adaptive management, and restoration economics. At the completion of this course students will be aware of the social, economic and biological drivers of ecological restoration and be able to critically assess the many differing views and controversies within the field.

ERES 526	CRN 13758	ECOLOGICAL RESTORATION PRACTICUM	30 POINTS	[2/3]
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Coordinator: Dr Heiko Wittmer

Students will develop practical skills and obtain knowledge enabling them to become involved in restoration projects. Special focus will be placed on skills that enable students to develop and implement a restoration plan but projects designed to evaluate the success of restoration efforts are also suitable. Students are expected to work with either government agencies (e.g., Wellington City Council, Greater Wellington Regional Council, DoC) and/or local community groups to get hands-on experience with actual restoration projects. Within this general framework (and with input from staff), students are expected to develop their own project.

MBIO 434	CRN 13742	MOLECULAR MICROBIOLOGY	30 POINTS	[1/3]
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Coordinator: Dr Ronan O'Toole

Molecular Microbiology covers diverse areas, ranging from the study of microbes associated with human disease, through to those found in all possible environments. The application of advanced molecular techniques in the study of micro-organisms has opened up a new world where-in lie an infinite number of possibilities, for example: new vaccines, diagnostics and treatments; new biotechnologies; or a new understanding of the origin and basis of cellular life. This course will consist of seminars introducing topics of contemporary importance in microbiology research, providing insight into the techniques used in microbiology and the development of advanced concepts and knowledge in the field. The course will be assessed by a combination of in-term assessments and a final exam. Students are strongly counselled to have taken BMSC 301 or an equivalent level of microbiology as preparation for this course.

MBIO 440	CRN 13743	DIRECTED INDIVIDUAL STUDY IN MOLECULAR MICROBIOLOGY	30 POINTS	[1+2/3]
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Restrictions: BIOL 440

This course consists of a supervised programme of study in Microbiology approved by the Head of School. You are advised to contact the coordinator of the Microbiology graduate programme. There are no formal prerequisites for this course.

MBIO 489	CRN 13744	RESEARCH PROJECT IN MOLECULAR MICROBIOLOGY	30 POINTS	[1+2/3]
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Coordinator: Dr Ronan O'Toole

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

CLNR 401	CRN 18711	INTRODUCTION TO CLINICAL RESEARCH AND CLINICAL TRIAL PRACTICE	15 POINTS	[1]
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Coordinator: Dr Jeremy Krebs
Prerequisite: Approval from course coordinator

CLNR 402	CRN 18712	ETHICS AND RESEARCH IN SPECIAL POPULATIONS AS APPLIED TO CLINICAL RESEARCH	15 POINTS	[1]
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Coordinator: Dr Jeremy Krebs
Prerequisite: Approval from course coordinator

CLNR 403	CRN 18713	BIOSTATISTICS AND INFORMATICS	15 POINTS	[2]
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Coordinator: Dr Jeremy Krebs
Prerequisite: Approval from course coordinator

CLNR 404	CRN 18714	QUALITATIVE METHODS IN CLINICAL RESEARCH	15 POINTS	[2]
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Coordinator: Dr Jeremy Krebs
Prerequisite: Approval from course coordinator

CLNR 405	CRN 18715	ADVANCED CLINICAL RESEARCH DESIGN, MANAGEMENT ANALYSIS	30 POINTS	[2]
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Coordinator: Dr Jeremy Krebs
Prerequisite: Approval from course coordinator

CLNR 580	CRN 18716	RESEARCH PREPARATION	30 POINTS	[1]
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Coordinator:	Dr Jeremy Krebs
Prerequisite	Approval from course coordinator

CLNR 591	CRN 23059	MASTERS THESIS IN CLINICAL RESEARCH	120 POINTS
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Coordinator:	Dr Jeremy Krebs
Prerequisite	Approval from Professor John Miller

Most students are part time and enrol in 30 points at a time, beginning in Trimester 1 which starts 5th March, and complete the programme on a part-time basis over 2 years.

Students can vary the sequence of courses CLNR 401- 404, but are better to complete these courses prior to enrolling in CLNR 405 and 580.

COURSES NOT OFFERED IN 2012

BIOL 436 Special Topic

BIOL 437 Special Topic

BIOL 439 Directed individual study

SCIE 401 Special Topic

ACADEMICS - RESEARCH AREAS

In this section are listed the research areas and projects offered by individual academic staff members for prospective Honours and Masters students for 2012.

CELL & MOLECULAR BIOSCIENCE, MICROBIOLOGY, AND BIOMEDICAL SCIENCE GRADUATE RESEARCH PROJECTS

The list is only indicative of the project titles for Honours and Masters students each year. The exact nature of the projects finally offered may differ from this, and a proposed project should be discussed with the supervisor offering the project. Some projects may also be awaiting regulatory approval. Further projects may become available, either internally or through external collaborations. Students intending to do postgraduate study in Cell and Molecular Bioscience or Biomedical Science are advised to identify at least three potential projects. Masters projects are handled differently from those for Honours, and you should make an intention to study for Masters clear to a supervisor during any discussions.

Dr David Ackerley

BIOTECHNOLOGY & MOLECULAR MICROBIOLOGY

Research in my laboratory is centred on identification, directed evolution, and applications of useful bacterial enzymes. We are particularly interested in nitroreductases (for anti-cancer gene therapy, bioremediation, and cellular imaging) and non-ribosomal peptide synthetases (tricky wee guys who are able to synthesise other polypeptides without being limited to a 20 amino acid repertoire). Projects offered in 2012 will be related to one of these areas.

Prof Paul Atkinson

CHEMICAL GENETICS

Most traits/phenotypes are complex (multigenic) in origin, as classical genetics long has shown. It is only since the early 2000s that whole genome sequencing, and affordable automation robotics is now allowing the molecular basis of complex inheritance to be systematically probed on a genome wide basis. The interaction of two gene mutations resulting in more than the individual mutation contributions is called "epistasis" and indicates a functional interaction between the two genes. When epistatic analyses are done on a genome-wide basis overlapping pairs of interactions allow construction of networks indicating functional relationships between many genes at once (Tong AH et al 2001, 2004).

This approach is finding increasing application in biology today but leaves the major question of what is network function as distinct from what is gene function? VUW's Chemical Genetics Laboratory (CGL) is systematically probing functional networks of particular genes of interest utilizing a highly utilitarian model eukaryote cell. The

SACCHAROMYCES CEREVISIAE YEAST gene deletion set (YGDS) of 6300 strains, each representing a specific gene deletion, allows genetic epistatic interactions to be measured in high throughput screens (HTS) requiring robotic automation. Elucidation of epistatic pairs comprising a deletion strain and a small molecule inhibitor (SMI) functioning IN LIEU of a mutation allow screening the major gene target for small molecule inhibitors (Parsons AB et al 2006).

Elucidating the genetic network in which the target operates may give information on side-effects, diagnostics and possible individual response to new drugs.

Projects in the CGL include (i) probing genetic networks around specific genes of interest in protein-folding (diabetes, Parkinson's, Alzheimer's and atherosclerosis for example are diseases involving protein folding); (ii) seeking pharmacological chaperones for protein folding disorders for example congenital disorders of glycosylation CDG-Ic; (iii) seeking the backup genetic networks of major gene drug targets in exploring drug side effects

Prof Richard Beasley

CLINICAL RESEARCH

The main clinical and clinical epidemiology research programmes are in the fields of respiratory medicine, pharmacovigilance, alcohol and drug abuse and fever. The MRINZ has a strong track record of supervising PhD students and will offer projects related to these fields in 2012. The research will be undertaken at the MRINZ primarily at the Wellington Hospital campus.

Dr Geoff Chambers

MOLECULAR BIOLOGY, EVOLUTION

I am presently recruiting only limited numbers of postgraduate research students, but I am always happy to discuss ideas for projects in the following areas:

Human Ancestry and Health: Previous projects cover various aspects of Pharmacogenomics including prediction of Type II diabetes in NZ Maori and the origin of Australian Aborigines. The focus has now shifted to tissue transplantation antigens and blood group typing using DNA-based methods. A further project will study metabolic syndrome in Norfolk islanders.

Wildlife Conservation and Environmental Monitoring: Work is underway in conjunction with Te Papa staff on the systematics of native spiders and with NZ Biosecure on mosquitoes. I also retain a personal interest in albatrosses and parakeets.

We are also using molecular studies and various analytical methods to characterise microbial communities in soil, with ESR Ltd as part of the forensics of human decomposition project. The subterranean aquifers project, with the GNS Institute will continue in 2010 and new metagenomics approaches are planned.

Basic Science of Genome Evolution: I am currently developing new ideas for projects on evolutionary processes in mitochondrial DNA and nuclear microsatellite loci. These exciting theory-based initiatives should present novel opportunities in bioinformatics and computing, as well as lab work.

For 2012 class I will be offering a BSc(Hons) or BMSc(Hons) project on the molecular genetics of native spiders jointly supervised with Dr Phil Lester.

Dr Simon Davy

MARINE SYMBIOSIS, CORAL REEF BIOLOGY

Students in my lab work on molecular, cellular, physiological and/or ecological aspects of marine symbioses, especially those between invertebrates (e.g. corals, sea anemones & sponges) and algae. Students also work on aspects of coral reef ecology, especially coral disease and bleaching. I am happy to discuss ideas, though I am especially keen to attract students in the following areas:

- Cellular basis of recognition and maintenance in algal-invertebrate symbioses
- Virus communities of reef corals
Coral bleaching mechanisms and physiological implications
- Molecular diversity and eco-physiology of temperate corals and sea anemones, and their symbiotic algae
- Molecular diversity, function and biogeography of symbiotic bacteria in NZ sea stars, urchins and sea cucumbers
- Molecular biology, physiology and ecology of sponge-microbial symbioses (with Dr. James Bell)

Dr Darren Day

BIOCHEMISTRY, MOLECULAR BIOLOGY

My laboratory's interests are focused on stem cell biology and the normal and aberrant development of the vascular system. Current projects involve studying the role of the primitive mesodermal stem cells in the etiology of haemangioma, the role of mesenchymal stem/progenitor cell function in venous malformations, the role of endothelial progenitor cells in psoriasis, and the formation of the vasculature in head and neck cancers. We work in close collaboration with Prof Tan and Dr Itinteang from the Gilles McIndoe Research Institute in the Hutt.

Prof Elaine Dennison

CLINICAL RESEARCH

My research interests focus on the epidemiology of musculoskeletal epidemiology, particularly osteoporosis. Based between Victoria University and the Clinical Trials Unit at Wellington hospital, I also have links with the Malaghan Institute (Dr Jacquie Harper) and the Rheumatology Unit at Hutt hospital (Dr Andrew Harrison). A particular research focus in the coming year will centre on the link between metabolic syndrome, cardiovascular disease and gout, particularly in Maori and Pacific populations. Other avenues of research include the epidemiology of osteoporotic fracture in New Zealand to establish temporal trends and to relate fracture to outcome in different groups; and bone turnover among young alcoholics before and after a detoxification programme.

Prof Alexander (Sandy) Garden

PATIENT SAFETY

An honours project will be offered in 2012 in the following area:

Circadian variation in mood in healthcare workers in an ICU.

The functioning of shift-workers is impaired in the middle of the night, and errors occur because of this. These errors can be catastrophic in high-risk industries such as healthcare. The deterioration in performance occurs because of the influence of the normal physiological nadir in circadian rhythm, and because the quality and quantity of daytime sleep are inferior to normal nocturnal sleep. This

project will add to a project examining the effects of roster patterns on sleep duration.

The project will be jointly supervised with Dr Paul Young, Intensive Care Specialist, Wellington Hospital.

Prof Jonathan Gardner

MARINE BIOLOGY, ECOLOGY, GENETICS, CONSERVATION

My research interests include a wide range of topics in marine biology, both in tropical and temperate regions. I am particularly interested in supervising postgraduate students in research areas such as:

Marine reserves and conservation (monitoring, survey design, habitat change, marine reserve network design, spill over and larval export, genetic connectivity)

Population and ecological genetics of marine species (genetic connectivity and nearshore oceanography, natural selection, stock identification, self recruitment)

Marine bioinvasions and biosecurity (identification of invasive species, ecological impacts of invaders; pre and post border control, aspects of management and policy related to biosecurity)

Intertidal and shallow subtidal ecology (ecophysiology of filter feeders, impacts of sedimentation on biota, physical and biological processes contributing to community structure)

Aquaculture (in particular of molluscan shellfish, impacts of aquaculture, genetics of aquaculture, food forensics using genetic techniques).

Prof Scott Harding

TRANSLATIONAL RESEARCH, PLATELET BIOLOGY, INFLAMMATION AND ATHEROSCLEROSIS

Atherothrombosis remains the leading cause of death and heart failure a leading cause of morbidity in the western world. The Wellington Cardiovascular Research Group undertakes basic science projects, translational research and clinical research into atherothrombosis, heart failure and arrhythmia. My primary research interests include Platelet Biology as well as inflammation and atherosclerosis and clinical research. The research is primarily undertaken at the Wellington Hospital campus. Projects offered in

2012 will be related to these areas.

Dr Ian Hermans

VACCINE RESEARCH

My research is aimed at improving the design of vaccines. The vaccines that most of us have been given as children generally stimulate production of antibodies that bind to pathogens to prevent infection taking hold. I am interested in a different class of vaccines that are designed to stimulate the activity of immune cells called T cells. Such “cell-mediated” immune responses have evolved to identify and destroy cells of the body that have been actually been infected with pathogens. A major theme of my research is to determine whether it is possible to stimulate cell-mediated immune responses that can identify and eliminate tumour cells in cancer patients. Such a vaccine could potentially be used as a new anti-cancer therapy, or could be used in conjunction with existing therapies. This research involves modelling vaccination in vivo, sterile tissue culture techniques, and immunological techniques such as flow cytometry, bioplex assays, and cell purification. Opportunities may exist for a student to undertake research in this area. I am happy to discuss project ideas with potential students.

Dr Bill Jordan

BIOCHEMISTRY, MOLECULAR PATHOLOGY

Research projects will not be offered in 2012

Dr Joanna Kirman (Malaghan Institute of Medical Research)

IMMUNOLOGY, CELL BIOLOGY

Over one third of the world’s population is infected with *Mycobacterium tuberculosis* (Tb) and as a result 2-3 million people die from Tb every year. The Ministry of Health in New Zealand has indicated that on average one New Zealander is infected with Tb every day and outbreaks regularly occur in NZ. The increase in drug resistant strains of Tb is alarming, and preventing the disease is an international priority. The currently available vaccine, BCG, is unreliable and has an average protective efficacy of 50%. It is least effective in countries closest to the equator, where Tb incidence is greatest. In this regard, the primary objective of our research is the rational design of a new, safe and effective vaccine for human and bovine Tb.

In order to contribute to the development of an effective Tb vaccine, the Infectious Diseases groups is focused on understanding the immunological basis of BCG failure, the cells and molecules mediating protection to Tb, and the development of novel DNA vaccines. This project would involve using a mouse model of mycobacterial infection to investigate one of these aspects of Tb vaccination, and would involve the use of animal handling, sterile tissue culture and immunological techniques such as flow cytometry, bioplex assays, cell purification.

Dr Bronwyn Kivell

NEUROBIOLOGY

Honours projects maybe available for 2012 in the following areas of neuroscience

Investigating the cellular actions of Ecstasy (MDMA) on serotonin transporter function..

Abuse of the recreational drug ecstasy is increasing in New Zealand. Ecstasy (MDMA) is neurotoxic because it down-regulates serotonin function in the brain. We are currently investigating the cellular effects of MDMA, particularly the mechanism into how MDMA modulates serotonin transporter trafficking.

Effects of nicotine on serotonin and dopamine transporter function: Smoking is one of the leading causes of preventable illness in the world. This research project will look into the cellular effects of nicotine and other components of cigarette smoke and their ability to modulate the function of monoamine transporters and various nicotinic receptors.

Investigating novel compounds to prevent addiction to drugs of abuse: Both the cellular and behavioural effects of novel kappa opioid receptor compounds will be tested in their ability to modulate addiction. Cellular pathways involved in the anti-addiction effects of these compounds will also be investigated.

Kappa anti-pain effects: Peripherally restricted kappa opioid receptor agonists have the ability to modulate pain without the undesirable CNS mediated effects such as sedation and depression seen with traditional kappa agonists. Novel peripherally restricted kappa agonists will be tested for their anti-pain effects.

Dr Jeremy Krebs

OBESITY, DIABETES

I am an Endocrinologist with a particular interest in obesity and diabetes.

As course director for the Postgraduate Diploma in Clinical Research I would recommend the diploma as ideal for people already working in clinical research or who would like to work in clinical research. It prepares you for undertaking clinical research projects in a professional setting and covers research ethics, statistics and clinical trial design. The Diploma draws on the research skills of Victoria University and the expertise from staff at the Victoria-based Malaghan Institute of Medical Research, together with the clinical knowledge of Capital and Coast District Health Board and the Medical Institute of New Zealand's clinical staff.

Dr Anne La Flamme

IMMUNOLOGY, CELL BIOLOGY, PARASITOLOGY

Honours projects will be available for 2012 in the following areas of immunology and cell biology:

Exploring macrophages as regulators of central nervous system inflammation. Macrophages are essential mediators of CNS infiltration during autoimmunity but the mechanisms by which they act are unclear. We have shown that altering their activation state can prevent autoimmunity and are exploring possible pathways by which this protection occurs.

Modifying inflammation with anti-mitotic drugs. In this project, the effect of microtubule-stabilizing drugs on immune response development and effector functions will be investigated. In particular, the effect of microtubule stabilization on non-dividing cells will provide insight into alternative activities of these anti-mitotic compounds.

Understanding schistosome-mediated liver damage. The parasitic worm, *Schistosoma mansoni*, causes severe liver pathology in 10% of infected patients. We are investigating the molecular pathways that cause liver damage and studying how the immune response dictates whether or not severe disease develops.

Prof Graham Le Gros

ASTHMA AND ALLERGIC DISEASES

The Th2 immune response in allergic disease

Conventional treatments for allergy and asthma, such as steroids, target the downstream steps of allergic (Th2 mediated) inflammation. However, how and why the earliest Th2 responses are first established in an individual, how they are maintained for a person's lifetime and why some allergens preferentially promote Th2 responses in only a subset of individuals, is still unknown. To address these questions we have developed a novel experimental system using GFP reporter IL-4 gene knock-in mice to look at the early events of Th2 sensitisation in response to common allergens such as house dust mites, cockroaches, peanuts and nematode worms. We have also developed novel physiological models of airway inflammation, skin sensitisation, and oral induced food allergy to better understand asthma and food allergy. In addition, a multidisciplinary approach has been taken to tackle the intriguing question of what makes an allergen an allergen, with the goal of identifying putative therapeutic targets for the treatment of allergic diseases.

Developing Th2 immunity against helminth parasites

Vaccination is currently viewed as the only long-term solution to preventing human hookworm infection. However, the cell types, tissues, effector molecules and cytokines that mediate protective immunity against helminth parasites, remain largely undefined. Previous work from our laboratory using knockout models and the rodent hookworm *Nippostrongylus brasiliensis*, identified Th2 immune responses, exemplified by MHC Class II, STAT6 and IL-4 dependency, as the important immunological parameters for generating protection in the lung. We are now extending this work by examining the role of basophils in protective immunity using IL-3 knockout models, as well as looking at the involvement of the innate cytokines IL-25, RelmA and RelmB. In a recent study we showed that the immune cells resident in the lung are critical for establishing protective immunity against tissue migrating hookworm larvae. These findings open novel areas of research in protective immunity against helminth parasites.

The basic biology of the Th2 immune response

A greater knowledge of the basic biology of what is a Th2 cell and what regulates a Th2 immune response is required in order to develop effective therapies for the treatment of allergic disease. Research from our group focuses on the cellular and molecular events that underpin the *in vivo* differentiation of naïve CD4 T cells to Th2 status. We examine in detail how many different cytokines are made by a Th2 cell and how their expression is controlled at a molecular level. We have found that in some circumstances *in vivo*, Th2 responses can occur independently of IL-4 and STAT-6 signalling - highlighting an as yet

undefined alternative pathway for Th2 differentiation. By combining innate cytokine and TLR signalling deficient mice with a GFP based Th2 reporter assay, we have created a novel tool to determine the specific biological roles that innate signals play in Th2 development in the context of allergic airway disease.

Dr Melanie McConnell

CELL SURVIVAL

Tumours grow under conditions of metabolic and energetic stress. They are subjected to chemotherapy, radiation, and immune attack, and a subset of tumour cells can survive all these stresses. Cancer stem cells (CSC) are a subset of cells within a tumour that are particularly resistant, surviving treatment and initiating new tumour formation, making them critical targets in the fight against relapse and metastasis. My research aims to dissect the relationship between the 3 key characteristics of a cancer stem cell: self-renewal, therapy resistance, and invasion; and to use this information to combat cancer cell survival.

For 2012 specific projects are available in analysing chemotherapy and radiation resistant cell populations in the brain tumour glioblastoma multiforme and in melanoma.

Prof Ken McNatty, Dr Doug Eckery , Dr Janet Pitman and Dr Joy McIntosh

PHYSIOLOGY, BIOTECHNOLOGY, MOLECULAR BIOLOGY

Honours and Masters projects will be available for 2012 in reproductive biology.

Our research is based around the central questions in female reproduction 'what is a good egg/oocyte, how can we measure oocyte health, and how can we develop healthy oocytes in the lab?'

Working with mammals (rodents, sheep, humans, possums) and native birds such as kakapo, we are studying three large areas of oocyte health:

i) Oocyte- somatic cell communication.

Growth factors secreted by the oocyte are known to play a large role in directing the function of surrounding somatic cells to influence follicular

development and ovulation rate. However, their active forms and mechanisms of action remain poorly understood. We are characterizing the expression, structure and bioactivity of two oocyte-secreted growth factors, namely BMP15 and GDF9, and investigating any species differences between these characteristics which might affect ovulation rate and litter size.

Gap junctions between the oocyte and somatic cells are also important during follicular development for the transfer of essential nutrients and other molecules (e.g. cAMP) to oocytes. We have developed an assay to measure the activity of these gap junctions to study the effects of growth factors and other components of follicular fluid, as well as environmental contaminants and lifestyle factors (e.g. caffeine, methamphetamines) on this route of oocyte support.

ii) Markers of oocyte health. Using sensitive quantitative PCR methods and follicular cells collected from women undergoing IVF, we are measuring levels of expression for various genes and assessing their correlation with morphological signs of oocyte health and the birth of healthy offspring. Our aim is to develop a multi-gene test for oocyte health to be used in fertility clinics.

iii) Detection of environmental contaminants. Environmental contaminants (e.g. BPA, triclosan, pesticides) are thought to affect oocyte health and fertility via several mechanisms. However assessing the levels of these compounds in biological fluids is time consuming and expensive. We are working to establish a new platform technology, based on aptamers, to develop rapid, sensitive and cost effective assays to detect and measure known contaminants in body fluids and water. .

Prof John H Miller

CELL BIOLOGY, PHYSIOLOGY

Mechanism of Action of Marine Natural Products. I am interested in the mode of action of natural products and their development as anti-cancer or anti-inflammatory drugs. In collaboration with the School of Chemical and Physical Sciences, we are testing the structure-activity relationships (SAR) of synthetic analogues of different marine natural products, including analogues of peloruside and zampanolide, two marine sponge secondary metabolites with potent cytotoxic activity. I am interested in the primary and secondary targets of these compounds and their modes of action in mammalian cells. I am also making use of chemical genetics in yeast to help decipher drug-target interactions.

Dr Ronan O'Toole

MOLECULAR MICROBIOLOGY & TUBERCULOSIS

Tuberculosis is the leading cause of death due to a single infectious organism. In 2009 alone, there were an estimated 9.4 million new cases of the disease worldwide. There is an urgent need for alternative drugs that act upon novel targets to provide more effective treatments for drug-resistant and latent forms of tuberculosis. The project on offer is in our **Tuberculosis Drug Discovery and Development** programme and is available to an Honours and/or Master student in Molecular Microbiology. More information is available on my staff homepage www.victoria.ac.nz/sbs/staff/ronan-otoole.aspx.

Dr Peter Ritchie

EVOLUTIONARY GENETICS

The primary interest of my research group is the population genetics of marine fish. My specific goals are to determine the genetic structure of fisheries stocks and develop new genetic markers for finfish aquaculture species. My research is where the pure sciences of genetics and evolution overlap with the activities of the seafood industry. Current projects include the population genetics and phylogeography of hoki, orange roughy, sharks, blue cod, hapuku, snapper, wrasses and rainbow trout. We use mitochondrial DNA, microsatellites and genome sequencing methods to detect environmentally important genetic variation and identifying adaptive genetic differences among wild and captive populations. Post-graduate students in my research group will develop a thorough understanding of evolutionary and population genetic theory and analyses, learn a range of laboratory skills, and be able to gain experience working alongside industry and government organisations.

Prof Franca Ronchese

IMMUNE CELL BIOLOGY

My group is interested in dendritic cells, immune cells that can activate or switch off immune responses, and how they interact with other cells of the immune system. Our goal is to use dendritic cells as the basis of immunotherapies for diseases such as cancer, where the immune system is underactive, or allergy and autoimmune disease where dendritic cells play an important role in maintaining inflammation.

Honours or Masters projects may be available in 2012 in the following areas:

Investigating how to make immune cells better able to attack cancer
Targeting dendritic cells to reduce allergic inflammation

Dr Ken Ryan

ECOPHYSIOLOGY

I supervise students in ecophysiology, biodiversity and microbial ecology. I undertake most of my research in Antarctica, but I have only limited spaces on field trips.

Functional role of novel phototrophic bacteria in sea ice (funding dependant). My research group has recently found light utilizing bacteria in sea ice, but we don't yet know their importance in sea ice ecosystems.

Survey of viral biodiversity in sea ice microbial communities (funding dependant). Viruses are the most abundant organisms in marine environments and they play important roles in biogeochemical cycles in the sea. Their role in sea ice is unknown (with Dr Simon Davy).

PCR analysis of bacterial samples of guano contaminated sea ice outside Adele penguin colonies on Ross Island and Terra Nova Bay.

Plant secondary metabolites in *Veronica*. In some NZ species, the antioxidant function normally associated with flavonoids has been transferred to iridoids, which normally have no antioxidant function. This presents interesting evolutionary questions (with Prof Garnock-Jones).

Effects of UVB and other environmental factors on algae and phytoplankton.

Dr Alexander Sasse

CARDIOLOGY

Cardiac Stem Cell Therapy. Previous and ongoing research interests are cardiac stem cell therapy in combination with the application of ex- and in-vivo gene therapy. Previous research was focussed on mechanisms of cell delivery in an animal model of myocardial infarction. Main aim was the assessment of parameters that influence the response to stem cell therapy. Special interest was the additional application of chemokines to influence trafficking of endogenous stem cells.

Cardiac Imaging. Heart failure and ischaemic heart disease are the leading causes of death and hospital admissions in the Western world. Another interest is the application of novel imaging techniques to aid in the diagnosis and treatment of heart disease. The modalities used in this field are echocardiography including strain and 3D imaging as well as cardiac MRI.

Dr Paul Teesdale-Spittle

BIOCHEMISTRY, MEDICINAL CHEMISTRY

Synthesis of fragments for hybrid tubulin stabilising agents.

A synthesis project making structural fragments of tubulin stabilising agents that can be built into the structure of peloruside, a potential anti-cancer drug sourced from a New Zealand marine sponge. Project joint with Dr Joanne Harvey, SCPS.

Probing and inhibiting eIF4A function. The eIF4A family play central roles in translation and mRNA processing. We have 'tagged' expression systems for both mammalian and yeast eIF4A proteins and will use these to probe the eIF4A family member activities and their protein binding partners. Additional projects in this area will involve selective targeting of eIF4As, which are conserved across diverse eukaryotes. We wish to investigate the ability to selectively target eIF4A proteins from different organisms or to target different isoforms of the protein within a specific organism. This project may involve computational analysis of protein structures, or could focus on experimental approaches to assaying activity of pateamine, a natural product that targets eIF4A proteins.

Dr Joe Zuccarello

PHYCOLOGY, MOLECULAR BIOLOGY

Evolutionary studies in algae with an emphasis on biodiversity of New Zealand seaweeds. Using molecular methods and classical methods to interpret the diversity and processes that produced the diversity seen.

Genetic markers in studying asexuality.

Asexuality is common in algae. Due to the cryptic nature of their sexual timing, genetic approaches are needed understand the extent of asexuality is populations, within species and within higher groups.

Discussion of other projects welcome

ECOLOGY & BIODIVERSITY AND MARINE BIOLOGY GRADUATE RESEARCH PROJECTS 2012

The list below gives a brief description of lecturers' research interests or potential topics for students in this section of the SBS. We work a little differently from the Cell & Molecular group, in that exact topics are not assigned. The exact nature of a proposed project should be discussed with the supervisor offering the project. Please note that we prefer students to formulate their own research ideas and interests to discuss with potential supervisors. Note also that some lecturers may be unable to take on any new students due to current supervising commitments. Masters projects are handled differently from those for Honours, and you should make an intention to study for masters clear to a supervisor during any discussions.

Prof Fred Allendorf

CONSERVATION GENETICS

My primary research interest is the application of population genetics to problems in conservation biology. This work involves collaboration with several other VUW staff members (e.g., Charles Daugherty, and Nicky Nelson). I am interested in developing collaborative programmes between Vic and the University of Montana, USA. My current projects and interests include the following:

The role of genetic variation in mitochondrial DNA in the viability of small populations.

Demographic effects of temperature-dependent sex determination in tuatara on long-term population viability.

The evolutionary significance of genetic variation at the Major Histocompatibility Complex in tuatara (in collaboration with Dr. Hilary Miller).

Restoration genetics.

Dr Ben Bell

ECOLOGY, BEHAVIOUR, CONSERVATION

My current research focuses on terrestrial vertebrate ecology & behaviour and on biodiversity conservation. My areas of interest include:

The interface between the behaviour, ecology and conservation

biology of terrestrial vertebrates, including both native and introduced

species

Avian bioacoustics, particularly the role of song in sexual selection, the use of capture-recapture models to estimate song repertoire size and the mechanisms of song dialect variation

The demography, behaviour and conservation of New Zealand frogs and reptiles

Ecological restoration and islands, including the development of mainland islands

Dr James Bell

MARINE ECOLOGY, POPULATION GENETICS

My research interests are primarily concerned with tropical and temperate subtidal and intertidal ecology. Most of my temperate field work is carried out within New Zealand, while tropical fieldwork is being carried out at sites within the central Pacific, South Pacific and Indo-Pacific regions (particularly the Wakatobi Marine National Park). At present I am looking for students to join my sponge ecology group. Specifically, I am currently interested in attracting students to work in the following areas:

1) Morphological variability of sponges in relation to environmental heterogeneity (suitable for MSc or PhD project). Sponges are an important component of marine systems that show considerable morphological variability within and between species. This project might focus on the drivers (environmentally and physiologically) of this variability, its adaptive significance and energetic costs.

2) The ecology of New Zealand calcareous sponges (suitable for MSc or PhD). The Wellington south coast has extensive subtidal populations of calcareous sponges, which is unusual for temperate regions, as demonsponges are usually the dominant component of the sponge fauna of rocky reefs. Recently we have discovered some important physiological and feeding differences between calcareous and demonsponges, which may account for the high abundance of this group on the nutrient poor Wellington South Coast. This project will focus on the ecology of the calcareous sponges in New Zealand.

3) Physiological and ecological effects of sedimentation on sponges (suitable for MSc or PhD). Sedimentation is a major threat to organisms inhabiting coastal environments and would be expected to have negative effects on suspensions feeders due to clogging. However, sponges appear in many parts of the world to be very abundant in sedimented environments. This project would focus on how sponges are able to tolerate supposed unsuitable habitats and

why some species seem to prefer these habitat types.

4) Other projects. I am also open to discussion on other projects in the areas of population genetics, connectivity, or related to Marine Protected Areas, as these are other areas of research by my group.

Dr Kevin (KC) Burns

ECOSYSTEMS ECOLOGY

I try to spend as much time as I can in the field, so most of my lab's research directions are developed from natural history observations in the Karori Wildlife Sanctuary, Otari-Wilton's Bush and Nelson Lakes National Park. As a result, my lab is currently working in a range of different ecological problems.

1. Bird behaviour and cognition - Most of our research on animal behaviour focuses on the food hoarding behaviour of New Zealand robins. Taking advantage of their lack of anti-predatory behaviours and fearlessness of humans, we are conducting field experiments in the Karori Wildlife Sanctuary to better understand their foraging tactics, spatial memory and cognition. Our other interests in animal behaviour include the influence of scale on spatial patterns in the foraging behaviour of frugivorous and insectivorous birds.

2. Community assembly rules - The processes shaping the structure of ecological communities remain poorly understood, despite nearly a century of study. Using a null model approach, we are investigating patterns in the assembly of a wide variety of plant and animal communities, including plant communities on islands offshore of the Wellington coast and in local Wellington forests.

3. Species interactions - Using a network approach we are evaluating community-level patterns in a variety of species interactions, including interactions between birds, flowers and fruits, as well as interactions between lianas, epiphytes, mistletoes and their hosts.

Dr Geoff Chambers

MOLECULAR BIOLOGY, EVOLUTION

I am presently recruiting only limited numbers of postgraduate research students, but I am always happy to discuss ideas for projects in the following areas:

Human Ancestry and Health: Previous projects cover various aspects of Pharmacogenomics including prediction of Type II diabetes in NZ Maori and the origin of Australian Aborigines. The focus has now shifted to tissue transplantation antigens and blood group typing using DNA-based methods. A further project will study metabolic syndrome in Norfolk islanders.

Wildlife Conservation and Environmental Monitoring: Work is underway in conjunction with Te Papa staff on the systematics of native spiders and with NZ Biosecure on mosquitoes. I also retain a personal interest in albatrosses and parakeets. We are also using molecular studies and various analytical methods to characterise microbial communities in soil, with ESR Ltd as part of the forensics of human decomposition project. The subterranean aquifers project, with the GNS Institute will continue in 2010 and new metagenomics approaches are planned.

Basic Science of Genome Evolution: I am currently developing new ideas for projects on evolutionary processes in mitochondrial DNA and nuclear microsatellite loci. These exciting theory-based initiatives should present novel opportunities in bioinformatics and computing, as well as lab work.

For 2012 class I will be offering a BSc(Hons) or BMSc(Hons) project on the molecular genetics of native spiders jointly supervised with Dr Phil Lester.

Dr Simon Davy

MARINE SYMBIOSIS, CORAL REEF BIOLOGY

Students in my lab work on molecular, cellular, physiological and/or ecological aspects of marine symbioses, especially those between invertebrates (e.g. corals, sea anemones & sponges) and algae. Students also work on aspects of coral reef ecology, especially coral

disease and bleaching. I am happy to discuss ideas, though I am especially keen to attract students in the following areas:

- Cellular basis of recognition and maintenance in algal-invertebrate symbioses

- Virus communities of reef corals
- Coral bleaching mechanisms and physiological implications
- Molecular diversity and eco-physiology of temperate corals and sea anemones, and their symbiotic algae
- Molecular diversity, function and biogeography of symbiotic bacteria in NZ sea stars, urchins and sea cucumbers
- Molecular biology, physiology and ecology of sponge-microbial symbioses (with Dr. James Bell)

Prof Jonathan Gardner

MARINE BIOLOGY, ECOLOGY, GENETICS, CONSERVATION

My research interests include a wide range of topics in marine biology, in both tropical and temperate regions. I am particularly interested in supervising postgraduate students in research areas such as:

Marine reserves and conservation (monitoring, survey design, habitat change, marine reserve network design, spill over and larval export, genetic connectivity)

Population and ecological genetics of marine species (genetic connectivity and nearshore oceanography, natural selection, stock identification, self recruitment)

Marine bioinvasions and biosecurity (identification of invasive species, ecological impacts of invaders; pre and post border control, aspects of management and policy related to biosecurity)

Intertidal and shallow subtidal ecology (ecophysiology of filter feeders, impacts of sedimentation on biota, physical and biological processes contributing to community structure)

Aquaculture (in particular of molluscan shellfish, impacts of aquaculture, genetics of aquaculture, food forensics using genetic techniques).

Prof Kevin Gould

PLANT PHYSIOLOGICAL ECOLOGY, INTEGRATED PLANT STRUCTURE

My group's current research interests fall into two areas:

(i) the functional responses of New Zealand's plants to environmental stress, and

(ii) the antioxidant potentials of traditional Māori foods as nutraceutical supplements for human health.

Recent students have focused on the physiological roles of red pigments in the protection of leaves, stems and tubers from high light, cold, ultraviolet radiation, herbivores and free radical attack. Others are examining the antioxidant activities of extracts from plants such as pūhā. I would invite any interested students to discuss their own ideas with me.

Dr Stephen Hartley

CONSERVATION BIOLOGY, SPATIAL ECOLOGY

My interests are in population dynamics, community structure and patterns of biodiversity in a spatial context, as well as conservation biology of plants and insects. I encourage students to pursue their own ideas and interests. Below are some suggested topics, but I am happy to discuss alternative projects.

Species distribution patterns and the different forms of rarity.

Why are some species widespread but always at low density, while other species are locally abundant but geographically restricted? (Relevant to any taxonomic group.)

Ant, spider, and beetle communities in coastal dunelands. How do these three groups interact in duneland environments? Of particular interest is how invasive ants, such as the Argentine ant, may be altering natural assemblages.

Responses of herbivores to the density and isolation of host plants. Do isolated plants attract a disproportionate number of insect herbivores? How do responses vary at landscape scales?

Bioclimatic modelling. Predicting species' distributions from climate and environmental variables. Typically used as part of a risk assessment for invasive species.

Dr Phil Lester

INSECT ECOLOGY

I primarily supervise students working in invasive species ecology. Potential projects in my laboratory group include examining patterns and mechanisms of co-existence in ant communities, the influence of dominant species on community assembly, and the relationship between disturbance and invasion. In addition, I welcome discussion with students regarding their own research ideas and interests.

Dr Wayne Linklater

WILDLIFE CONSERVATION BIOLOGY

Post-doctoral or post-graduate projects available:

Urban Ecology

Conduct studies of biodiversity and people in urban environments:

- social and ecological implications of urban restoration
- a human-wildlife conflict, social and ecological science
- urban landscape ecology and biodiversity pattern

Black rhinoceros behavioural ecology and conservation

Studies of black rhinoceros in multiple parks and reserves in KwaZulu-Natal and Eastern Cape, South Africa:

- translocation biology
- population dynamics and performance

Chemical lures for mammals

The development and testing of chemical attractants for detecting and capturing small mammals at low density

Sex allocation

Mechanisms and consequences of sex allocation in mammals

Dr Nicola Nelson

CONSERVATION BIOLOGY

I supervise students interested in conservation biology, with a particular emphasis on reptiles. Current research interests include:

1. How will global warming affect reptiles with temperature dependent sex determination?
2. Temperature dependent sex determination in tuatara.
3. How do mate choice and territoriality affect fitness of tuatara?
4. Testing tools for conservation of reptiles: artificial incubation, headstarting and translocation.
5. Parasites and sociality of reptiles.
6. Population ecology of reptiles.

Feel free to come and discuss potential projects with me, either under one of the themes above or to help develop your own ideas.

Dr Nicole Phillips

MARINE BIOLOGY, ECOLOGY

I supervise students in marine biology and ecology, with projects generally focused on intertidal and shallow subtidal marine organisms. Some areas I am particularly interested in (but not limited to) are factors influencing dispersal and recruitment, life history tradeoffs, larval and reproductive ecology of benthic marine invertebrates. I encourage students as far as possible to pursue topics/questions generated from their own interests, and am happy to talk through ideas and possibilities.

Dr Peter Ritchie

EVOLUTIONARY GENETICS

The primary interest of my research group is the population genetics of marine fish. My specific goals are to determine the genetic structure of fisheries stocks and develop new genetic markers for finfish aquaculture species. My research is where the pure sciences of genetics and evolution overlap with the activities of the seafood industry. Current projects include the population genetics and

phylogeography of hoki, orange roughy, sharks, blue cod, hapuku, snapper, wrasses and rainbow trout. We use mitochondrial DNA, microsatellites and genome sequencing methods to detect environmentally important genetic variation and identifying adaptive genetic differences among wild and captive populations. Post-graduate students in my research group will develop a thorough understanding of evolutionary and population genetic theory and analyses, learn a range of laboratory skills, and be able to gain experience working alongside industry and government organisations.

Dr Ken Ryan

ECOPHYSIOLOGY

I supervise students in ecophysiology, biodiversity and microbial ecology. I undertake most of my research in Antarctica, but I have only limited spaces on field trips.

Functional role of novel phototrophic bacteria in sea ice (funding dependant). My research group has recently found light utilizing bacteria in sea ice, but we don't yet know their importance in sea ice ecosystems.

Survey of viral biodiversity in sea ice microbial communities (funding dependant). Viruses are the most abundant organisms in marine environments and they play important roles in biogeochemical cycles in the sea. Their role in sea ice is unknown (with Dr Simon Davy).

PCR analysis of bacterial samples of guano contaminated sea ice outside Adele penguin colonies on Ross Island and Terra Nova Bay.

Plant secondary metabolites in *Veronica*. In some NZ species, the antioxidant function normally associated with flavonoids has been transferred to iridoids, which normally have no antioxidant function. This presents interesting evolutionary questions (with Prof Garnock-Jones).

Effects of UVB and other environmental factors on algae and phytoplankton.

Dr Jeff Shima

MARINE ECOLOGY, FISH BIOLOGY

I supervise students in marine biology and ecology. I use quantitative and experimental approaches to understand drivers of distribution, abundance and dynamics of organisms.

I am particularly interested in the early life-histories of organisms with stage-structured populations (e.g., the eggs, larvae and juveniles of most marine reef organisms, but also things like seeds and seedlings of plants) and the important roles that these life stages play in population dynamics.

For additional information about my research interests, current students, and philosophy on student supervision, please see: www.victoria.ac.nz/staff/jeffrey_shima/

Dr Heiko Wittmer

CONSERVATION AND ECOLOGICAL RESTORATION

Terrestrial vertebrate ecology (mammals);

Dynamics of small populations (including Allee effects);

Predator-prey interactions - particularly the effects of changes in relative abundances in multi-prey, multi-predator systems (e.g., apparent competition, introduction of exotics).

Dr Joe Zuccarello

PHYCOLOGY, MOLECULAR BIOLOGY

Evolutionary studies in algae with an emphasis on biodiversity of New Zealand seaweeds. Using molecular methods and classical methods to interpret the diversity and processes that produced the diversity seen.

Genetic markers in studying asexuality.

Asexuality is common in algae. Due to the cryptic nature of their sexual timing, genetic approaches are needed understand the extent of asexuality is populations, within species and within higher groups.
Discussion of other projects welcome

GENERAL INFORMATION

Students are encouraged to view the websites for current information.

POSTGRADUATE RESEARCH SUPERVISION

Academic Board requires all supervisors to provide six-monthly written reports on students enrolled in Master's by thesis and PhD courses. These reports are expected to identify what has been achieved, outline agreed timetables for future work and identify any problems with a student's performance that require to be rectified. Copies of the formal written reports are provided to the student and the School's Postgraduate Coordinator, and put on file in the Faculty Student Administration Office.

Theses are prepared and written in close consultation with a staff member who acts as supervisor. Research students are expected to participate in and contribute to research-in-progress seminars organised from time to time by the School.

FUNDING

The Research Funding Guide is published by the University's Research Policy Office and is available on the University website at www.victoria.ac.nz/home/publications/research_funding_guide.pdf.

The Postgraduate Students' Association has information on StudyLink funding. www.victoria.ac.nz/pgsa.

POSTGRADUATE SCHOLARSHIPS, PRIZES AND GRANTS

Students should check out the University's Prizes and Scholarships database, accessible at: www.victoria.ac.nz/scholarships.

Faculty Research Grants and Summer Scholarships may also be available. margot.neas@vuw.ac.nz: Contact Margot Neas for more information
www.victoria.ac.nz/science/study/summer-scholarships.aspx: Summer scholarships.

POSTGRADUATE STUDENTS' ASSOCIATION

www.victoria.ac.nz/pgsa: Provides representation and other services for all Victoria's postgraduate students.

pgsa-members-subscribe@vuw.ac.nz: Subscribe to the PGSA email list.

VICTORIA OVERSEAS EXCHANGE (VIC OE)

Students studying course-taught postgraduate studies are able to participate in an exchange, however not all of our partner universities are open to postgraduate students – please talk to the Student Exchange Office about which universities will be open to you. www.victoria.ac.nz/exchange/

STUDENT SUPPORT SERVICES

Student Services provides a range of services to all students to help you make the most of your time at university. If you have an issue, need guidance to get through your studies, help is available.

www.victoria.ac.nz/home/viclife/studentsservice/default.aspx

STUDENT AND ACADEMIC SERVICES - FACULTY OF SCIENCE

Te Wāhanga Pūtaiao

Address: Level 1, Cotton Building
 Phone: 04-463 5101
 Email: science-faculty@vuw.ac.nz
 Web: www.victoria.ac.nz/science
 Hours: 8.30 am – 5 pm Monday, Wednesday, Thursday, Friday
 9.30 am – 5pm Tuesday

At the Faculty of Science Student Administration Office **student advisers** can help with admission requirements, degree planning, changing courses, transfer of credit from other tertiary institutions, and anything else that may crop up during your time at Vic. They also deal with other aspects of student administration such as enrolment, exams organisation and the maintenance of student records.

The advisers support students throughout their study. To ensure you get good continuity of personal service, advisers manage a particular group of students, identified by the first letter of your surname:

Area	Student Advisor	Email	Contact
A-H	Patricia Stein	patricia.stein@vuw.ac.nz	04-463 5982
I-Q	Rachel Zhang	rachel.zhang@vuw.ac.nz	04-463 5983
R-Z	Janelle Parry	janelle.parry@vuw.ac.nz	04-463 5981
Johan Barnard	Manager, Student and Academic Services		Tel: 04-463 5980
Shona de Sain	Associate Dean (Students)		Tel: 04-463 5092

TE RŌPŪ ĀWHINA

Address: Cotton Building, Kelburn Parade, Room 148,
Phone: 04-463 5987
Email: teropuawhina@gmail.com
Web: www.victoria.ac.nz/science/awhina

Te Rōpū Āwhina whānau in the Faculties of Science, Engineering and Architecture and Design at Victoria University of Wellington was established in 1999. Āwhina is about people and collective success. The kaupapa of Āwhina is to produce Māori and Pacific science, engineering, architecture and design professionals to contribute to Māori and Pacific community and leadership development. Anyone who assists the building of Āwhina is part of the whānau.

QUESTIONNAIRE FOR INTENDING GRADUATE STUDENTS IN SBS FOR 2012

Applicants for admission to the graduate group should discuss their general interests with the appropriate staff such as potential supervisors, or the relevant graduate coordinator, preferably before the summer vacation break. This discussion will normally include some consideration of project/thesis topic and where there are optional courses, the appropriate combination of these. You are encouraged also to discuss possible projects with the staff member in your general area of interest; this **must** be done early if your project is likely to involve fieldwork over the summer period. Projects in Cell and Molecular Bioscience will not be allocated until the beginning of the 2012 academic year.

PLEASE COMPLETE THE FOLLOWING AND RETURN IT TO YOUR POST-GRADUATE ADMINISTRATOR AS SOON AS POSSIBLE

Note that the closing date for the Masters of Marine Conservation & Masters of Conservation Biology is October 15. For other programmes you may apply at any time.

1. **Name:** _____ **VUW Student ID:** _____

2. **Address for contact during vacation:**

E-mail: _____ Telephone: () _____

3. **Intended degree (circle one):**

BSc (Hons) MSc Pt1 GDipSc BBmedSc (Hons) MBmedSc

PGDipSci

Masters of Conservation Biology

Masters of Marine Conservation

4. **Subject of study:**

Biotechnology
Conservation Biology
Ecological Restoration
Microbiology

Cell and Molecular Bioscience
Ecology and Biodiversity
Marine Biology

5. **Level of certainty (circle one):** definitely probably possibly

6. **General area of research interest.** At this stage all you need indicate is some undergraduate course(s) that have interested you most.

.....

7. I have discussed possible project topics with the following academic staff member(s):

.....

8. **Teaching position.** Do you wish to be considered for a teaching position (sessional assistant) in 2012? (Circle one).

Interested

Possibly Interested

Not Interested

Tick preferred subject area:

Plants

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Ecology

Animals

Cell and Molecular Biosciences

Marine Biology

Conservation Biology

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>