

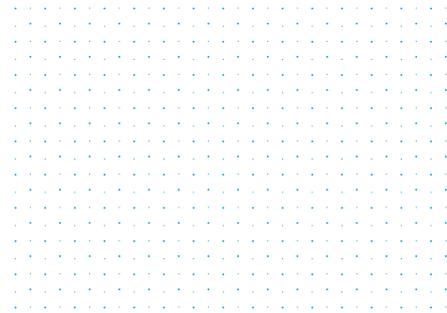


Research Capacity

Never Stand Still

Science

School of Biotechnology and Biomolecular Sciences



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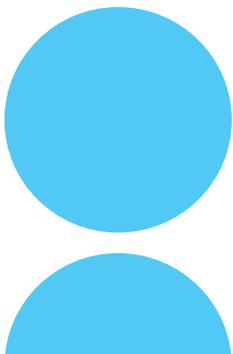
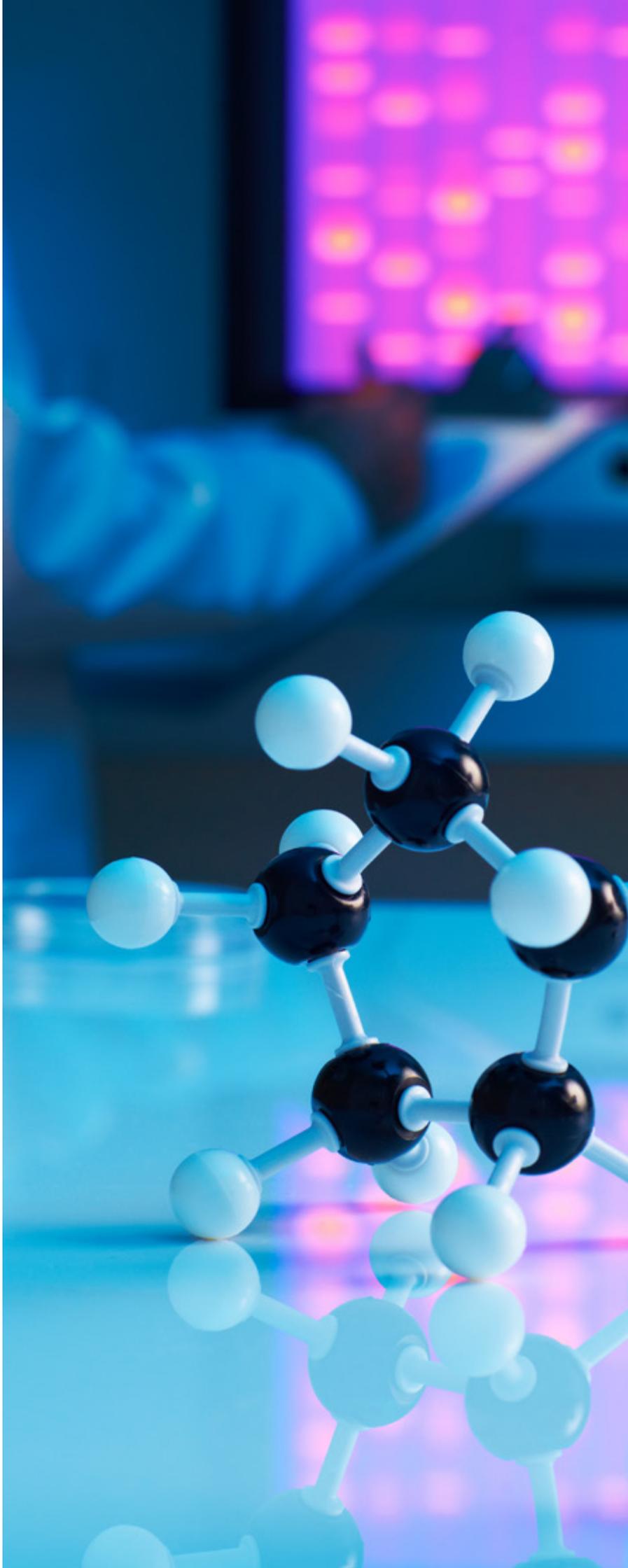
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Introduction

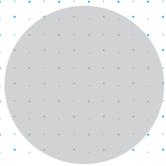
Welcome from the Dean of the Faculty of Science



World-class research, a capacity for innovation and a heritage of solving challenges faced by society have made the Faculty of Science at UNSW Australia a premier research and technology development destination. UNSW has for decades been recognised for its internationally competitive advantage in the biomolecular sciences. The School of Biotechnology and Biomolecular Sciences (BABS), of which I am proud to be an active research member, is the stronghold of this area of strength within the University. With expansive international professional networks, the School has an underlying bench-to-business philosophy that is manifest in research portfolios seeking to improve human health, environmental health and wealth generation.

Professor Merlin Crossley

Welcome from the Head of School of Biotechnology and Biomolecular Sciences



The School of BABS is a powerhouse of biomolecular research employing 33 academics, 50 research associates and 16 technical and administrative staff. At any point in time, BABS is training over 150 Higher Degree by Research students, and employing 37 academics, 44 research associates and 21 professional and technical staff. BABS consistently attracts a lion's share of government and industry funding and top-tier academic accolades. Our achievements in technology development are underpinned by excellence in fundamental research. In this booklet we showcase the breadth and quality of biomolecular research in the School and invite you to consider how our research capacity comprising infrastructure, expertise and networks could be of benefit to you and your interests.

Professor Andrew Brown

About UNSW Australia and the School of Biotechnology and Biomolecular Sciences

UNSW Australia is one of the leading research-intensive universities in the Asia Pacific, attracting high calibre students and staff from over 120 countries who work together to find solutions to some of the world's most pressing issues. Ranked as one of the top 50 universities in the world, we are internationally recognised for excellence in science, technology, business and the professions. We are also renowned for our international focus and excellence in learning and teaching.

UNSW Australia has very strong links to industry. In 2014 we received \$10.5m in Linkage project grants from the Australian Research Council, the highest level of funding nationally. We were the first University in

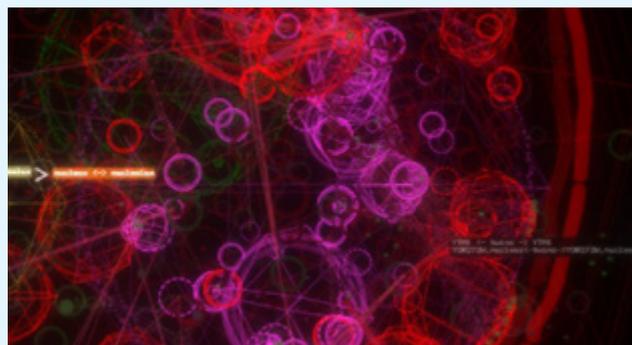
Australia, and one of the first in the world, to offer the majority of our research discoveries, inventions and intellectual property to companies and individuals for free. This new system – Easy Access IP – aims to transform more of our research into products and services to benefit society.

The UNSW School of Biotechnology and Biomolecular Sciences (BABS) is now one of the largest and most prestigious schools of scientific research and teaching in Australia. With distinguished academic staff, an innovative teaching program and state-of-the-art facilities, BABS is producing graduates and scientific discoveries of international renown.

Researchers in the School are aligned into four discipline areas:

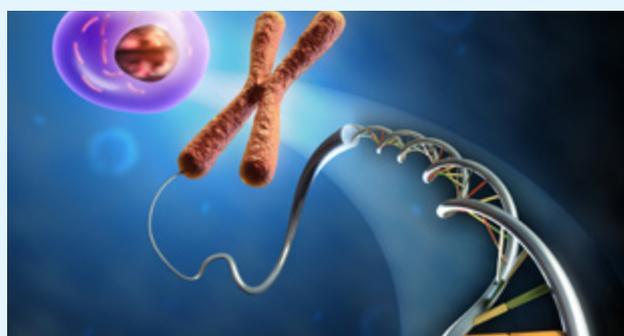
1. Environmental Microbiology

Environmental Microbiology forms a top-level research grouping at UNSW. Coupled with the biotechnology sector, we have a strong presence in the pure and applied biosciences. BABS addresses globally relevant research themes in environmental health and sustainability, microbial processes, biomaterials and nanotechnology, environmental genomics, biodiversity and conservation, bioprospecting for enzyme and drug discovery. Current research projects encompass numerous national and international networks with Asian, European and US-based research institutes and universities.



2. Systems and Cellular Biology

The Systems and Cellular Biology (SCB) group undertakes research in the biology of eukaryotes. SCB groups are active users of high-technology facilities, with researchers being highly successful in attracting regular competitive Category 1 funding, particularly from the ARC and NHMRC. The group has also been active in securing infrastructure funding in genomics, proteomics and systems biology. Research areas for this group include cholesterol and sterols, cell stress and aging, genetic mapping of phenotypes and disease protein interaction networks and systems biology.



3. Molecular Medicine

Molecular Medicine within BABS has a unique strength in combining fundamental biological and biomolecular sciences with a strong applied biotechnology and medical focus. The School facilitates collaborative research efforts across discipline boundaries for fundamental discoveries, generation of commercial opportunities and clinical research. Major research strengths of the group currently exist in biomaterials, immunology, bioinformatics, cancer and genetics. The group uses a wide range of cutting-edge molecular and bioinformatic tools to understand and combat genetic disease and cancer. Specific research foci include cancer, immunogenetics and biomaterials.

4. Infectious Disease

Infectious diseases are responsible for around one-third of annual deaths worldwide. The BABS Infectious Disease research group focuses on molecular epidemiology, with an aim to combat microbes that remain a huge biological challenge affecting both human and animal health. The group brings together a wide range of internationally recognised research expertise to investigate the microbiological factors affecting a range of vital health issues including tracking norovirus pandemics, molecular evolution and population structure of bacterial pathogens (*Bordetella*, *Salmonella*, *Shigella* and *Vibrio*), immune evasion by hepatitis, inflammatory bowel disease, viruses in cancer.



Facilities

Ramaciotti Centre for Genomics

The Ramaciotti Centre for Genomics is a UNSW Centre that provides genomic services to both academic and industry groups. Delivering high quality data and excellent personalised service, our professional team has many years of experience in facilitating projects from design through to downstream analysis. Services include:

Transcriptomics

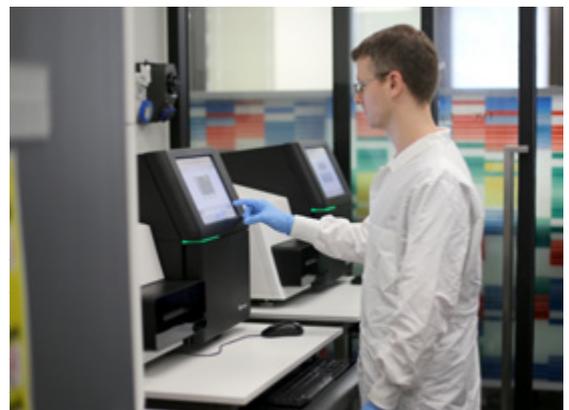
- Transcriptome sequencing
- Isoform sequencing
- Gene expression analysis
- miRNA analysis

Genomics

- Genome sequencing (long & short read)
- Whole human genome sequencing (X-Ten)
- Targeted sequencing
- Amplicon sequencing
- Epigenetic sequencing
- SNP genotyping
- Copy number variation

Single Cell

- RNA sequencing
- Genome sequencing
- Gene expression analysis



Ramaciotti Centre for Genomics

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UNSW Recombinant Products Facility

Mission

To provide research support for protein science at UNSW through design, production and purification of recombinant proteins.

Available Infrastructure

Fermentation and Cell Culture

- 96 and 24 well plate microbioreactors
- Shake flasks, including sub-ambient capabilities
- 2L, 5L, 10L and 15L microbial fermentation
- Phenometrics Algal Photobioreactor

Primary Recovery

- Cross flow filtration and diafiltration
- Centrifugation

Purification

- 2 x AKTA protein purification systems
- HPLC for proteins
- GRACE Flash chromatography system

Other Resources

- Electroporation
- Protein electrophoresis and Western Blotting



NSW Systems Biology Initiative

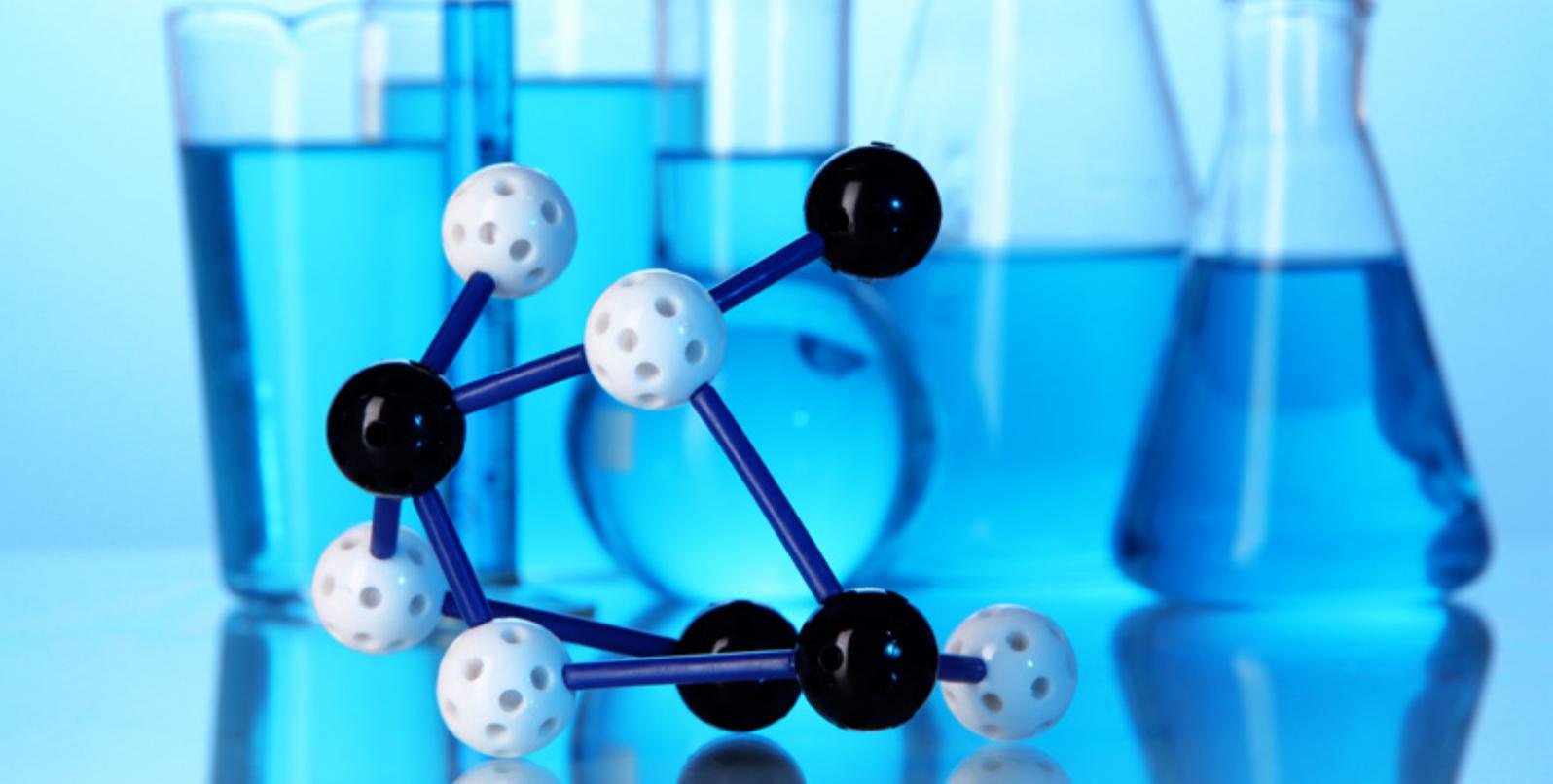
The New South Wales Systems Biology Initiative, funded by the Australian Research Council, NSW State Government and the EIF Super Science Scheme, is a non-profit facility within BABS at UNSW. We are one of Australia's foremost centres for Systems Biology, undertaking basic and applied research in the development and application of bioinformatics for genomics and proteomics. We work closely with users of NCRIS funded Omics facilities, specifically the Ramaciotti Centre for Genomics, the Bioanalytical Mass Spectrometry Facility, and the Australian Proteome Analysis Facility. *Wilkins*.



Joint Academic Microbiology Seminars Inc

The Joint Academic Microbiology Seminars (JAMS Inc) was co-founded in 2010 as a networking and ideas exchange forum by BABS staff. Bringing together microbiologists from five universities in Sydney on a monthly basis, JAMS provides a platform for large funding bids and a shop front for access to a breathtaking array of microbiology expertise available locally and internationally. JAMS also represents a strong link between BABS and the Australian Museum. *Manefield*.





UNSW Mark Wainwright Analytical Centre

Biological and Biomolecular Capabilities

Mass spectrometry and chromatographic separation:

- GC, LC, LC-LC, proteomic LC, gel electrophoresis
- Low MW analysis of small molecules, including metabolomic analysis
- Proteins, polymers and other high MW or polar molecules including proteomics
- Mass accuracy and high resolution analysis
- Stable isotope analysis
- Desorption electrospray ionisation (DESI)
- Comprehensive range of biological assays

Molecular structure:

- NMR spectroscopy for structure determination to 20kDa
- Infrared, Raman, UV-visible and circular dichroism spectroscopy
- Small molecule X-ray crystallography and macromolecular X-ray crystallography

Biological imaging:

- Extensive range of fluorescence microscopes enabling in vitro and in vivo study of biological processes at cellular and sub-cellular resolution
- Nanometer imaging of cellular structures using atomic force microscopy (AFM)
- Biological electron microscopy: SEM and TEM
- Chemical and isotopic imaging using TOF SIMS
- Molecular imaging using MALDI TOF, Raman and infrared spectroscopy

Cell and particle sorting:

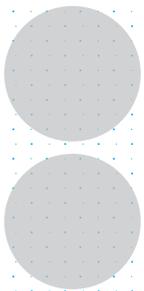
- Sorting cytometers, analysing cytometers
- Dynamic light scatter (DLS) size analysis and nanoparticle tracking analysis

Preclinical imaging:

- High frequency ultrasound
- Positron emission tomography (PET), micro computed tomography (microCT)
- Whole-body optical imaging (bioluminescence and fluorescence)
- High-resolution, high-sensitivity magnetic resonance (MR) imaging system

Mark Wainwright Analytical Centre,
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Projects

Infectious Disease (bacteria)

Infectious disease caused by bacteria continues to be a significant burden globally. BABS boasts enviable depth of staffing in this space, with researchers collaborating with public health organisations, quarantine services and agricultural and animal production sectors to control infectious disease. Recent projects include:

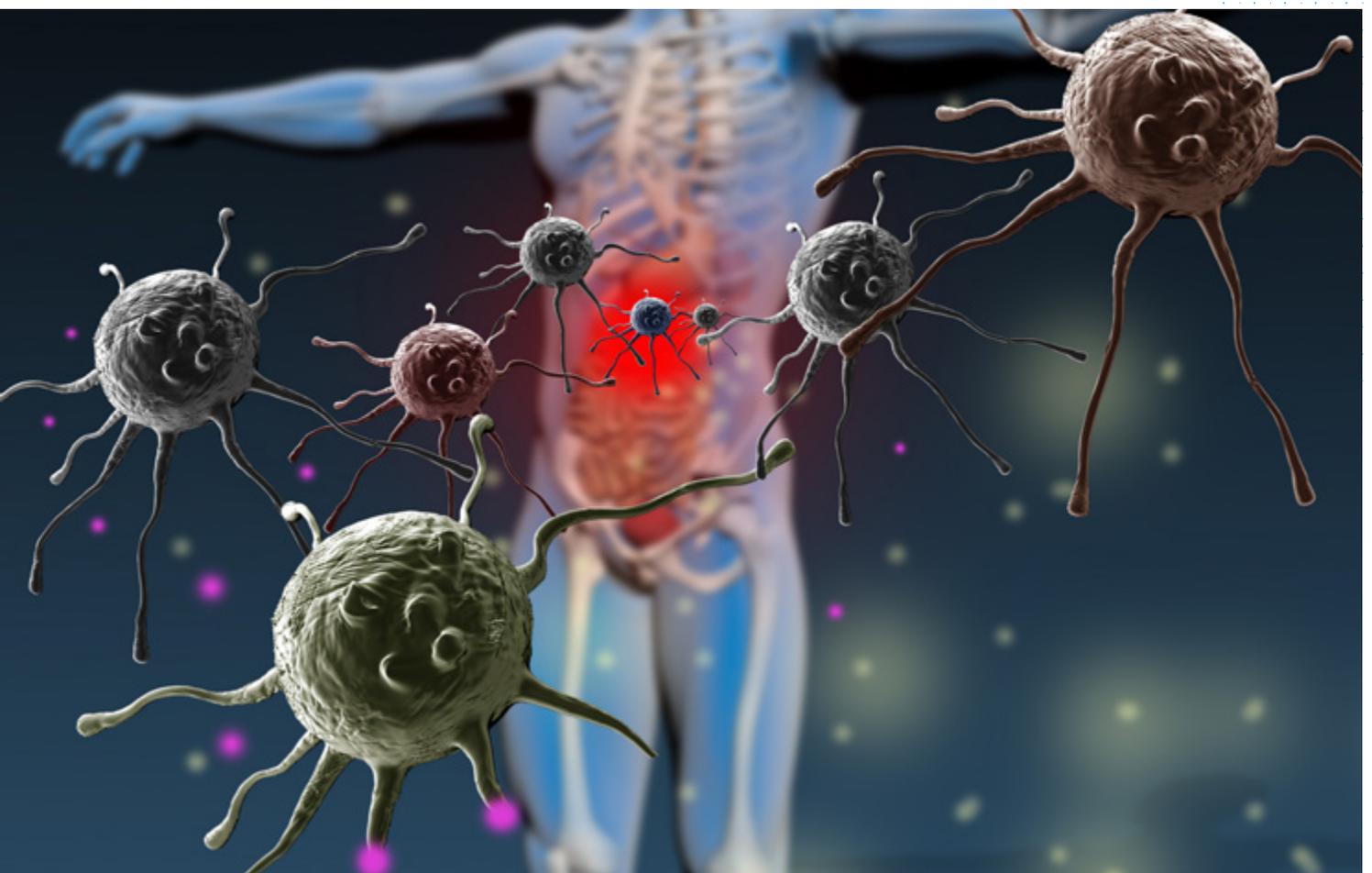
- Uncovering the ubiquitous nature of non-coding RNA regulation of virulence in bacteria by high-throughput analysis of RNA-RNA interaction networks in vivo. *Tree.*
- Characterisation of the candidate division Saccharibacteria that is associated with human disease in clinical environments using novel cultivation methods and high throughput sequencing. *Ferrari.*
- Investigation of the role of emerging *Campylobacter* species in gastroenteritis and Inflammatory Bowel Disease (IBD) using molecular cell biology, secretomics, genome sequencing and high throughput sequencing. *Mitchell.*
- Developing multiple diagnostic methods to examine the involvement of oral *Campylobacter* species such as *Campylobacter concisus* and their toxins in a subgroup of patients with inflammatory bowel disease. *Zhang.*
- Elucidating key proteomic changes contributing to the adaptation of the epidemic *Bordetella pertussis* strains circulating in Australia using western blot, proteomic and bioinformatic analyses. *Lan.*
- Development of an internationally standardized typing scheme for *Bordetella pertussis* based on single nucleotide polymorphisms (SNPs), genomics and bioinformatics. *Lan.*
- Molecular typing of *Salmonella typhimurium* DT108/DT170 strains using genomic data for better discrimination and outbreak detection. *Lan.*
- Elucidating mechanisms of bacterial resistance to nanosilver including live cell reactive oxygen species imaging and toxicology in collaboration with the UNSW School of Chemical Engineering. *Marquis.*
- Understanding post-transcriptional regulation of virulence genes in pathogenic *E. coli* through transcriptome-wide analysis of RNA-protein interactions. *Tree.*
- Modelling the dynamics of drug-resistant strains of *Mycobacterium tuberculosis* to predict the epidemiological consequences of extensively drug resistant TB and other multi-drug-resistant bacteria. *Tanaka.*
- Investigating the role of virulence factors produced by *Campylobacter* species in initiating demyelinating diseases including multiple sclerosis (MS) and chronic inflammatory demyelinating polyneuropathy (CIDP) using cell culture, ELISA, western-blotting and immune staining. *Zhang.*
- Investigation of microbial changes occurring following faecal transplantation in patients with ulcerative colitis using high throughput sequencing with the aim of determining the association between changes in the microbiota and clinical remission. *Mitchell.*
- Discovering new biologically active metabolites from seaweed, sponge and coral associated bacteria to develop next generation antibiotics. *Egan.*
- Development of medical devices to promote wound healing while locally delivering antimicrobial agents to prevent infection. *Foster.*

Infectious Disease (viruses)

Infectious diseases caused by viruses are the root of some of the world's most critical health problems. Pathogens such as SARS, swine influenza and Ebola are a constant and rapidly evolving threat. BABS research focuses on molecular epidemiology, with an aim to combat viruses that remain a huge biological challenge affecting both human and animal health.

Recent projects include:

- Investigation of prophage diversity and the pathogenic role of prophage proteins and phage induction in inflammatory bowel disease associated *Campylobacter* species using bacterial cultivation, ELISA, western-blotting, confocal, electron microscopy and bioinformatics analysis. *Zhang*.
- Studying the modulation of transcription in HIV-1 using noncoding RNA (ncRNA) from HIV-1 to identify molecular mechanisms whereby ncRNAs control viral replication. *Morris*.
- Modelling the molecular evolution of viruses to understand the spread and control of viral diseases using mathematical and computational models. *Tanaka*.
- Tracking norovirus (GII.4) evolution using molecular detection tools developed in house for epidemiological studies as part of national and international networks that track pandemic noroviruses globally. *White*.
- Development of small compound viral polymerase inhibitors using high throughput screening and purified recombinant enzymes central to viral replication to treat and prevent Hepatitis C virus infections. *White*.
- Re-assembling ancient viral genomes from molecular relics in the DNA of modern day mosquitos and reverse engineering the production of viral particles from the past. *White*.
- Engineering monoclonal antibodies that identify and neutralize bacterial and viral pathogens. *Collins*.
- Combinatorial biosynthesis of new antibiotics, immunosuppressants and antiviral compounds for control of infectious disease using a non-ribosomal peptide synthase blueprint. *Neilan*.
- Application of bioinformatics tools to identify protein-protein interactions and molecular mimicry in host-pathogen interactions. *Edwards*.
- Identification of viral infections from host whole genome/exome sequencing and/or RNA-Seq transcriptomics. *Edwards*.





Genetic Disease, Ageing and Mental Health

Debilitating conditions associated with genetic disease, ageing and mental health represent a major challenge for humankind. BABS research in the highly competitive molecular medicine arena has attracted funding through ARC, NHMRC and NCRIS schemes and from charitable and industry sources.

Recent projects include:

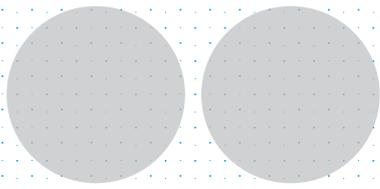
- Using long non-coding RNA molecules to activate expression of a gene essential for lung function (cystic fibrosis transconductance regulator) as a means of treating cystic fibrosis patients. *Morris.*
- Reactivating foetal globin genes involved in blood function in people with sickle cell anaemia and thalassaemia through manipulation of biomolecular signalling networks. *Crossley.*
- Elevating personal glutathione levels to prevent Alzheimer's and Parkinson's, using approved food grade metabolic precursor gamma-glutamylcysteine. *Bridge.*
- Determining the role of organelle (mitochondrial) dysfunction in the ageing related Parkinson's disease using fly, mouse and human fibroblast cell models with varied protein to carbohydrate ratios. *Ballard.*
- Describing the role of cell surface adhesion molecules in the establishment of neural networks in the brain using neuron cell culture and cutting edge imaging and contemporary biochemical methods. *Sytnyk.*
- Understanding the role of cholesterol transport from endosomes and lysosomes in neurodegenerative diseases such as Alzheimer's. *Yang.*
- Unravelling the molecular mechanisms of synapse formation behind psychiatric and mental disorders using proteomics, molecular biology, neurobiology and biophysics. *Sytnyk.*
- Characterizing the role of neuronal-specific splicing factors in heritable neuropsychiatric conditions such as the autism spectrum disorders. *Voineagu.*
- Identifying brain-specific non-coding regulatory regions enriched for genetic variants associated with autism spectrum disorders. *Voineagu.*
- Identification of genomic instability events (somatic TNR expansion) in the human brain that cause neuropsychiatric disorders such as Huntington's disease, Fragile X syndrome and Friedreich's ataxia. *Voineagu.*
- Describing the role of long intervening non-coding RNA in axon myelination in white matter and differentiation of glial cells in the human brain using analysis of expression patterns, RNA secondary structure and transcriptional factor binding motifs. *Janitz.*
- Identification of transcriptomic markers of human brain ageing using transcriptome sequencing and bioinformatics tools developed in house. *Janitz.*
- Complex multi-enzyme production of novel neuroactive drugs based on neurotoxins from marine microbes responsible for amnesic or paralytic shellfish poisoning. *Neilan.*
- Determination of the molecular mechanism of alpha-synuclein aggregation in the neurodegenerative disease multiple system atrophy using RT-PCR, qPCR, western blotting and RNA interference. *Janitz.*
- Investigating olfactory stem cells (OSC) to assess the influence of microgravity on neural pathway communication, in collaboration with NASA and in accordance with its bioastronautics roadmap. *Burns.*



Environmental Health

Human health is dependent on environmental and ecosystem health, and environmental health is underwritten by microbes. BABS has a long-standing tradition of excellence in environmental microbiology and biotechnology research and fields the strongest collective of staff in this applied space in Australia. Recent projects include:

- Describing the ecology and evolution of microbes in Antarctica and the Southern Ocean to monitor ecosystem health and discover novel species (including viruses) and cellular products for biotechnological applications using fieldwork genomics/proteomics, metagenomics/metaproteomics, bioinformatics, biochemistry/biophysics and enzymology. *Cavicchioli*.
- Clean-up of hydrocarbon and organochlorine-contaminated groundwater using field scale application of aerobic and anaerobic pollution degrading bacteria monitored by genomics, transcriptomics, proteomics and analytical chemistry. *Manefield*.
- Microbial community dynamics, eco-toxicity and bioremediation of Casey Station, Antarctica, and sub-Antarctic Macquarie Island. *Ferrari*.
- Employing metagenomics and single-cell technologies to uncover microbial diversity and ecosystem functioning in soils from the Windmill Islands in Eastern Antarctica. *Ferrari*.
- Investigating microbial strategies for survival in extreme environments (e.g. space and early Earth), with a focus on osmotolerance, cell-cell signalling and polymer (EPS) production in microbes from ancient stromatolites in Shark Bay, Western Australia. *Burns*.
- Development of recombinant reductive dehalogenases for destruction of chlorinated organic pollutants in situ (reactive enzymatic barriers in groundwater) and ex situ (bioreactors for stockpiled waste destruction). *Marquis*.
- Developing charcoal for sustainable agriculture by characterising how microbial interactions change nutrient cycling and utilisation in soil, using high-throughput DNA sequencing and advanced visualisation techniques. *Thomas*.
- Creation of stable vector systems in archaea with an understanding of plasmid partitioning systems enabling sophisticated genetic modification in this domain of life and insight into early evolution. *Lan*.
- Handcrafting complex microbial communities on particulate organic matter (chitin, lipid or cellulose based sludge flocculates), to harvest nutrients from industrial and municipal wastewater. *Manefield*.
- Identification of basin-scale drivers in microbial community composition, including the influence of the El Niño/La Niña-Southern Oscillation, by comparing microbial community time course data off the coast of Los Angeles and Sydney. *M Brown*.
- Identification of molecular determinants of symbiotic bacteria that control phagocytosis and cytoskeletal formation in marine sponges. *Thomas*.
- Deciphering the mechanism of microbial disease progression in marine habitat-forming macroalgae. *Egan*.
- Predicting algal bloom formation using DNA sequencing and bioinformatics, including microbial succession and metabolic pathway evolution in ocean waters in response to dust storm deposition of iron and nutrients. *M Brown*.
- Developing predictive, whole ecosystem models of ocean dynamics and health using citizen oceanography data collection. *Lauro*.



Bioenergy and Bioprocessing

With an enviable heritage in bioethanol production and bioprocessing, BABS has a keen eye on exploiting the metabolic diversity and catalytic activities of microorganisms. We are in the age of the domestication of microbes and BABS researchers are on the front line. Recent projects include:

- Patented bioelectrochemical approaches to stimulating biogas (methane) production by complex microbial communities at field scale using renewable (food waste and landfill) and non-renewable (coal and oil shale) feed stocks. *Manefield.*
- Recombinant lipase production and immobilisation on nanoparticle surfaces for lipase-mediated biodiesel production used for its capacity to handle lower-quality feed oils and produce a cleaner fuel product for downstream processing. *Marquis.*
- Comparing protein-protein interactions in yeast and humans to learn how post-translational modifications dynamically control the complex inner workings of cells. *Edwards.*
- Probing methylation and phosphorylation of hub proteins to describe the protein interaction code in yeast using conditional two hybrid systems. *Wilkins.*
- Discovering novel methyltransferase enzymes in yeast. *Wilkins*
- Genetic screening and cutting edge culturing for bioamelioration of soil salinity in Australia, involving application of cyanobacteria and mycorrhizal fungi to enable crops to tolerate saline conditions. *Neilan.*
- Destruction of toxic waste stockpiles (hexachlorobenzene and other organochlorines) using hydrogen fed organohalide respiring bacteria in syntrophic partnership with fermentative hydrogen producing bacteria. *Manefield.*
- Fungal degradation of petroleum hydrocarbons by novel cold adapted fungi isolated from soil using novel cultivation approaches. *Ferrari.*



Our People – As at May 2015

Academic Staff

Professors	Senior Lecturers
Bill Ballard	Wallace Bridge
Andrew Brown (Head of School)	Brendan Burns
Rick Cavicchioli	Richard Edwards
Merlin Crossley (Dean, Faculty of Science)	Belinda Ferrari
Staffan Kjelleberg FAA (Scientia Professor)	Kyle Hoehn
Hazel Mitchell	Michael Janitz
Brett Neilan (Scientia Professor)	Louise Lutze-Mann (Deputy Head of School)
Peter White	Chris Marquis
Marc Wilkins	Vladimir Sytnyk
Malcolm Walter (ARC Professorial Fellow)	Jai Tree
H Robert Yang (NHMRC Senior Research Fellow)	Irina Voineagu (ARC DECRA Fellow)
	Paul Waters
Associate Professors	Li Zhang
Andrew Collins	
John Foster	Lecturers
Ruiting Lan	Anne Galea
Michael Manefield	Rebecca LeBard
Kevin Morris (ARC Future Fellow)	John Wilson
Vincent Murray	
Mark Tanaka (ARC Future Fellow)	Associate Lecturers
Noel Whitaker (Associate Dean International)	Nirmani Wijenayake Gamachchige
Torsten Thomas (ARC Future Fellow)	

Professional & Technical Staff

Administration	Technical Officers
Adam Abdool, Administrative Officer (50%)	Ned Elkaid
Jenny Campbell, Administrative Assistant	Daud Khaled BSc Hons MSc (Dhaka) PhD (UNSW)
Avril Clarkson, Administrative Officer	Elessa Marendy BSc Hons, PhD (JCU)
Theresa Kahwati, WHS Manager	Sharon Murarotto BAppSc (UTS)
Geoff Kornfeld, Professional Officer Infrastructure	Kim Nguyen BSc (UNSW)
Jani O'Rourke BSc (USYD) PhD (UNSW), Professional Officer (Laboratory Manager)	Shamima Shirin
Michele Potter BA (USYD), School Manager	Owen Sprod BSc Hons PhD (U Tasmania)
Jeff Welch BSc Hons PhD (UNSW), Professional Officer Infrastructure	Bonny Tsoi
William Whitfield, Finance Officer	Lily Zhang BEng (Tianjin)
	Technical Assistant
	Angela Guider

Research Staff

Research Fellows	Susan Corley
Suhelen Egan (ARC Future Fellow)	Paul D'Agostino
Gene Hart-Smith (ARC DECRA Fellow)	Nandan Deshpande
Si Ming Man (NHMRC Early Career Fellow)	Robin Du
Adam Palmer	Melissa Erce
	Rajesh Ghai Nadeem Kaakoush
Senior Research Associates	John Kalaitzis
Jim Fang	Ruby Lin
Andrew Kelly	Winnie Luu
Iryna Leshchynska	Rabia Mazmouz
Kate Quinlan	Sophie Octavia
Bettina Rosche	Sarah Ongley
Tim Williams	Martin Pagac
	Iggy Pang
Research Associates	Leanne Pearson
Michelle Allen	Jacob Qi
Tim Amos	Laura Sharpe
Amelia Assareh	Aiden Tay
Robert Barnes	Shafagh Waters
Sabrina Beckman	Jason Woodhouse
Mark Brown	
Frances Byrne	Research Assistants
Natalia Castano Rodriguez	Yi Gao
Carmen Chan	Helene Lebhar
Rocky Chau	Nidhi Sodhi
Zhiliang Chen	

Visiting Staff

Emmanuelle Botte (Visiting Fellow)	Karen MacKenzie (Conjoint)
Andrew Burgess (Conjoint)	Anne Mai-Prochnow (Adjunct)
Ian Dawes FAA (Emeritus)	Susan McDougald (Adjunct)
Michael Edwards (Honorary)	Kerensa McElroy (Conjoint)
Susanne Erdmann (Visiting Fellow)	Richard Pearson (Honorary)
Haluk Ertan (Professorial Visiting Fellow)	William Rawlinson AM (Professorial Visiting Fellow)
Alister Funnell (Adjunct)	Peter Rogers (Emeritus)
Wendy Glenn (Honorary)	Carly Rosewarne (Adjunct)
Peter Gray (Emeritus)	Stuart Tangye (Visiting Fellow)
Young J Jeon (Visiting Fellow)	Alison Todd (Senior Visiting Fellow)
James Krycer (Conjoint)	Nai Tran-Dinh (Adjunct)
Federico Lauro (Adjunct)	Mark Van Asten (Adjunct)
James Lawson (Emeritus)	Sheila Van Holst Pellekaan (Visiting Fellow)
Ruby Lin (Adjunct)	Pieter Visscher (Senior Visiting Fellow)
Yaping Lu (Visiting Fellow)	Martin Zarka (Adjunct)

