

SCHOOL OF BIOMEDICAL SCIENCE - www.uq.edu.au/sbms

Dr Awais Saleem Babri

- Using surgery as an adjunct to teach human gross anatomy to third-year science students.
Keywords: Surgery, Human gross anatomy, life-long learning, small group teaching, regional anatomy
- Anatomy of procedural skills- A step forward to teach regional anatomy to Y1/2 nurses.
Keywords: Anatomy, regional anatomy, procedural skills, human gross anatomy, nursing
- Flipped classroom an experiment to enhance biomedical science teaching in Masters of Nursing program using learning parameters of Bloom's Taxonomy.
Keywords: Flipped classroom, biomedical science, Masters of Nursing, Bloom's taxonomy, student-centered learning

A/Prof Mark Bellingham

- Regulation of motor neurone excitability:
 - Cholinergic receptor regulation of motor neurone excitability - neuropharmacology and second messenger systems
 - Regulation of transmitter release from presynaptic terminals contacting motor neurone
- The neuromotor system in health and disease:
 - Role of sodium channels and glutamate receptors in motor neurone disease
 - The pathogenesis of motor neuron death in motor neurone disease
 - The role of neuroendocrinology and energy metabolism in motor neurone disease (with [Prof Chen Chen](#))
 - Effects of stress and anti-stress odours on neuronal excitability and synaptic plasticity in the hippocampus and cortex (with [Dr Nick Lavidis](#))
- Rhythmic control of breathing movements:
 - Muscarinic responses of motor neurones and rhythm-generating network for breathing movements in sleep apnoea and SIDS
 - Role of glycine and GABA A receptors in rhythmic motor activity in normal and transgenic knockout mice (with [A/Prof Peter Noakes](#))

Dr Karin Borges

- Metabolic approaches to improve energy metabolism in models of epilepsy
- Metabolic approaches to improve energy metabolism of neuromuscular disorders

Dr Richard Clark

- Novel peptide drug leads for the treatment of pain
- Development of peptide pro-drugs for inflammatory diseases
- Novel labelling strategies for disulphide-rich peptides
- Synthesis and structural studies of novel toxins from ticks
- Discovery and characterisation of ant peptides for the development of novel antibiotic drugs

Dr Prasad Chunduri

(In collaboration with Dr Kelly Matthews at the *Institute for Teaching and Learning Innovation*, UQ)

- What do students think they actually learn from a BSc degree? Are BSc students prepared with the right skills for employment?
- *Students as Partners* is about harnessing student and academic collaborations to enhance teaching and learning at university. What do students and academics think about this approach? What aspects of university teaching and learning are appropriate for such collaboration?

Dr Kay Colthorpe/Dr Louise Ainscough/ Dr Hardy Ernst/ Ms Tracey Langfield

- Student learning in the sciences - How do science students learn? How can this learning be facilitated, improved and made more efficient?
- How do students deal with difficult concepts in biomedical science? What makes those concepts difficult to learn?
- Enhancing study strategies and learning: evaluating how students regulate their learning and the value of meta-learning tasks for improving learning?
- Developing self-evaluation: student's ability to self-evaluate is critical to academic success. Can we enhance the process of self-evaluation through collaborative tasks?
- Does student-generated multimedia offer a path to educational reform, moving toward student-centred learning in which the educational system reflects students' current practice and interests outside the university? Does it benefit learning and aid in sense-making for the students or promote intellectual rigor, logical reasoning and critical thinking?
- Is mobile learning able to leverage student-owned technology for academic benefit? Can it create active, high-impact and engaging learning opportunities?
- Student approaches to learning anatomy

Keywords: learning science; physiology education; self-regulated learning; self-evaluation; student-generated multimedia; mobile learning; anatomy education

Professor Chen Chen

- Ion channels and intracellular signalling systems in hypothalamic-pituitary growth hormone axis in obesity and diabetes
Keywords: neuroendocrinology, electrophysiology, receptor, insulin, ghrelin
- Ghrelin and growth hormone secretagogues protect cardiomyocytes from ischemic and diabetic damage through actions on cell signalling and function, and endocrine systems
Keywords: GHS receptor, insulin, beta cell, GH, CD36
- Endocrine profiles in diabetes, obesity and fasting in relation to the treatment of metabolic disorders in mouse models
Keywords: GH, Insulin, leptin, ghrelin, IGF-1

Available Honours Projects

- Biomarker in diabetes, and diabetic retinopathy in diabetic mouse models
Keywords: growth factor, IGF, GH, insulin, inflammation
- Adipocyte biology and function in obese and diabetic mouse models
Keywords: fatty acid binding protein, adipose tissue, metabolic regulation, obesity, insulin resistance

Dr Brooke Coombes

- Examination of tendon mechanical properties using shear wave elastography to quantify the effects of injury (tendinopathy) and exercise
- Examination of neuropathic symptoms using quantitative sensory testing in patients with chemotherapy induced peripheral neuropathy

Dr Christian Gruber

- Discovery of novel ligands for peptide G protein-coupled receptors
- Ligand design and pharmacology of oxytocin and vasopressin receptors
- Modulation of insect physiology and behaviour by nature-derived peptides
- Peptides targeting cell proliferation for the development of novel immunosuppressive therapeutics

Dr Lisa Kaminskas

- Can differences in drug disposition towards the lymphatic and mononuclear phagocyte systems explain gender differences in the pharmacokinetics of macromolecular chemotherapeutic drugs in rodents?
Keywords: pharmacokinetics, cancer, lymphatic, sex, nanomedicine
- Eliminating morbidity associated with preventative lymphadenectomy through the application of nanomedicines to the site of primary cancer removal
Keywords: cancer, lymphatic, nanomedicine, chemotherapy
- Understanding differences in the cellular trafficking and tumour disposition of PEGylated and native antibodies and antibody fragments: implications for chemotherapy?
Keywords: cancer, antibody, pharmacokinetics, chemotherapy, cell
- Improving the treatment of rare and lethal diseases with PEGylated enzymes
Keywords: pharmacokinetics, pegylation, pharmacodynamics, disease, biochemistry
- Nanomedicinal platforms for combining enhanced tumour drug delivery and multimodal disease imaging
Keywords: nanomedicine, cancer, imaging, pharmacokinetics, chemotherapy

Dr Bradley Launikonis

- The effect of heat shock protein on skeletal muscle fibres
- Communication between t-system, nucleus and golgi apparatus
- Changes in the handling of calcium in the fatigued muscle
- The role of cholesterol in the t-system membrane-effect on membrane protein function
- Comparison of amphibian and mammalian skeletal muscle calcium handling

Available Honours Projects

Dr Nickolas Lavidis

- Effect of stress on reactive oxygen species and nitric oxide levels within different regions of the brain
Keywords: stress, oxidative stress, nitric oxide, brain, memory loss
- Activation of inflammatory mediators during chronic stress exposure
Keywords: chronic stress, inflammation, neuronal excitation, brain damage, memory loss
- Methods in reducing stress in farm animals
Keywords: animal welfare, sheep, stress, animal transport, meat quality
- Human study on the stress relieving and anti-oxidant properties of StayCalm42
Keywords: clinical study, hypertension, sleep disorders, stress, natural therapy
- Regulation of neurotransmitter release during different seasons in amphibian neuromuscular junctions
Keywords: seasons, toads, frogs, neurotransmission, neuromuscular protection
- Interaction between ATP and noradrenaline during sympathetic neurotransmission
Keywords: noradrenaline, ATP, neurotransmission, sympathetic nervous system, co-transmission

Dr Sean Millard

- Identification and characterisation of cell-specific splicing factors that regulate Dscam2 isoform expression.
- Investigating mechanisms for Dscam2 localisation in different neurons.
- How does Dscam2 signal repulsion?
- How does Dscam2 regulate sleep?
- Investigating candidate genes for sporadic ALS at the fly NMJ.
- Modelling epilepsy in flies.

Keywords: Neuroscience, Development, Synaptogenesis, Genetics, Cell recognition molecules

Professor Rodney Minchin

- Induction of sulfotransferases in human neuronal cells – role in dopamine toxicity
- Acetylation of cellular sirtulin deacetylases as a drug target in cancer
- Role of sulfotransferases in dopamine metabolism in Parkinson's disease
- Binding of lung surfactant proteins to nanoparticles and their role in recognition but macrophages

Dr Dominic Ng

- Biochemical and functional characterization of novel cell cycle regulators using cell cultures, isolated primary cells and 3D organoids
- Define the WD40-Repeat Protein regulatory mechanisms required for ciliogenesis.
- Characterize the molecular and cellular functions of microcephaly proteins.
- Identify and characterize kinase signalling networks required for cardiac myocyte differentiation and survival.

Available Honours Projects

- Study the effect of inhibiting Polo-like kinase 4 (Plk4) signalling and centriole biogenesis on cell and tissue organization.
- Novel mechanisms and function of tubulin-binding, microtubule destabilizing proteins.

Keywords: Cell Signalling, Cytoskeleton, Neuroscience, Cardiovascular, Cell Biology

A/Prof Peter Noakes

- Role of the innate immune system in the shaping of neuromotor system during normal development, and during the course of neuromuscular diseases
- Understanding the molecular mechanisms underlying complement receptor activation in motoneurons and glia: mechanisms of neuronal survival and death
- Exploring the therapeutic effects of complement agonists and antagonists in the treatment of motoneuron disease
- Regulation of neuromuscular connections during development and during the progression of motoneuron disease: the role of adhesion molecules
- How does central synaptic transmission regulate the development of motoneurons?
- The roles of activity dependant trophic factors in shaping the final number and morphology of motoneurons during development of the neuromotor system.
- The roles of extracellular matrix molecules in shaping the development of motor neurons that connect with respiratory and non-respiratory muscles: neural net organisation in normal development and during motor neuron disease.
- The roles of adhesive molecules in organising pre-and post-synaptic transmitter release sites
- The roles of RNA binding proteins hnRNP2A/B, TDP43 and FUS in synaptic function. This will involve the tracking in real time the transport of mRNA that bind to these proteins. It will employ real time imaging of neurons carrying mutations to these proteins.
- The differential expression of pre-synaptic mRNAs in upper motor neurons – in control Vs MND patients – Synaptosome and RNASeq Project
- The generation of skeletal muscle and motoneurons from human adult stem cells to re-construct the human neuromuscular circuit to explore mechanisms of motor neuron disease and its treatment with drugs

Dr. Olga Panagiotopoulou/ Dr Aland/ Mrs Langfield (SBMS) and Dr Collins (SHRS)

- Intrinsic dorsal foot muscles: A dissection study and physiological cross-sectional quantification
- Intrinsic plantar layer 1 foot muscles: A dissection study and physiological cross-sectional quantification
- Internal architecture of selected intrinsic foot muscles: A histology study

Keywords: Human foot; musculature; dissection; physiology; histology

A/Prof Simon Phipps

- The effect of maternal diet and the microbiome on susceptibility to viral bronchiolitis
Keywords: virus, microbiome, metabolomics, inflammation, Tregs
- The contribution of necroptotic cell death to the onset of type-2 immunity
Keywords: virus, necroptosis, RIPK1, inflammation, asthma
- Understanding the mechanisms by which plasmacytoid dendritic cells protect against virus-induced asthma
Keywords: pDC, interferon, Tregs, virus, inflammation
- ER stress and antiviral immunity
Keywords: ER stress, IL-17, lung, virus, inflammation

Dr Lachlan Rash

- Characterisation of novel sodium channel modulators from spider venoms
Keywords: Spider venom peptide, voltage-gated sodium channel, binding site, electrophysiology, mechanism of action
- Spider venom peptides as tools to study acid-sensing ion channels, potential drug targets in neurological disease
Keywords: structure-activity studies, mechanism of action, pharmacokinetics, in vitro pharmacology

Dr Johan Rosengren

- Understanding the interactions between relaxin peptide hormones and their receptors and structure based drug design
- Improving blood-brain barrier penetration and in vivo stability of a relaxin-3 receptor antagonist with anti-obesity potential

Dr Marc Ruitenber

- Intravenous immunoglobulin (IVIg) therapy as an immunomodulatory treatment for acute spinal cord injury
Keywords: neurotrauma, inflammation, secondary injury, mechanism of action, complement
- Characterising the role of extracellular vesicles and micro-particles as novel regulators of inflammation in neurotrauma
Keywords: spinal cord injury, systemic inflammation, autoimmunity, spleen, recovery

Associate Professor Ethan Scott

- Circuit-level processing and integration of visual, auditory, and vestibular information
Keywords: sensory systems, neural circuits, vision, hearing, zebrafish
- Animal modelling of sensory and motor circuits in Autism Spectrum Disorder
Keywords: autism, vision, hearing, schizophrenia, zebrafish
- Development of advanced microscopy and neuroinformatic techniques
Keywords: optical physics, computational neuroscience, bioinformatics, artificial intelligence, neural circuits

Available Honours Projects

Dr Kirsty Short

- Fluoro flu: Creating fluorescently labelled strains of influenza virus for a new understanding of disease pathogenesis
Keywords: influenza, respiratory disease, virus, imaging, immunology

Dr Ulrike Siebeck

- Archerfish face discrimination – visual learning and memory

Dr David Simmons

- Unravelling the functions placental cell types using transgenic mouse models
- Investigating cell-cell fusion in the mouse and human placenta

Dr Carl Stephan

- Chest radiograph comparison for human identification
- Face prediction for human identification

Professor Wally Thomas

- Elucidating the function of taste receptors in human heart tissue
- A light-activated receptor in the heart?
- Investigating new mechanisms of GPCR and EGFR crosstalk in the heart

Dr Kylie Tucker

- Does acute hip pain alter movement control during balance, step down and rotation tasks?

Dr Jana Vukovic

- The role of microglia in regulating neurogenesis and learning/memory
- Characterisation of hippocampal neurons important for spatial learning

A/Prof Trent Woodruff

- Therapeutic inhibition of inflammation in experimental models of Parkinson's disease: towards the development of novel neuroprotective agents
- Novel therapeutic strategies to treat Motor Neuron Disease: translational research in human patients and animal models of disease
- Pharmacological development and characterisation of next-generation anti-inflammatory drugs targeting the central nervous system

Keywords: neurodegeneration, therapeutics, drug development, inflammation, immune system

QUEENSLAND BRAIN INSTITUTE- www.qbi.uq.edu.au

[Dr Victor Anggono](#)

- Molecular Mechanisms Underlying Presynaptic Vesicle Recycling
- Molecular Mechanisms Underlying Postsynaptic Glutamate Receptor Trafficking

[Associate Professor Kai-Hsiang Chuang](#)

- Imaging brain connectome of transgenic mouse models
- Understand neural basis of resting-state functional connectivity
- Molecular imaging of brain activity and connectivity

[Associate Professor Helen Cooper](#)

- Adult Neurogenesis
- Formation of the Neocortex
- Axon Navigation in the Growing Brain

[Professor Darryl Eyles](#)

- What is the Underlying Mechanism Behind how Vitamin D Regulates Dopamine Synthesis and Neuron Survival?
- Does Vitamin D Deficiency During Gestation alter Dopaminergic Connectivity?

[Professor Geoffrey Goodhill](#)

- Analysis of Nerve Fibre Guidance
- Computational Modelling of Neural Coding
- Computational Modelling of Nerve Fibre Guidance

[Professor Jürgen Götz](#)

- Study of the Effect of Ageing on Striatal Function and its Consequences on Motivated Behaviours
- Physiological Function of Tau, a Protein with a Central Role in Alzheimer's Disease
- Understanding the Microstructure of Motivated Behaviours: Neural Bases of Learning and Refinement of Goal-oriented Behaviours
- Role of Direct and Indirect Pathways of the Basal Ganglia in Action Execution
- Selective Vulnerability in Neurodegeneration
- Mechanisms of Tau-mediated A β Toxicity
- The Role of Exosomes in Neurodegeneration
- Electrophysiological Studies of Tauopathies
- Development of Single-chain Antibodies and Therapeutic Interventions
- Molecules Involved in Glial Uptake of Amyloid-beta
- Crosstalk of Neurons in Glia in Neurodegeneration

[Associate Professor Massimo Hilliard](#)

- Discover and study novel genes involved in axonal degeneration in *C. elegans* neurons
- Characterize the Membrane Dynamics and Synaptic Distribution During Axonal Regeneration in *C. elegans* Neurons

[Professor Joe Lynch](#)

- How do Hereditary Epilepsy Mutations affect GABAergic Synaptic Signalling?
- How do Hereditary Human Startle Disease Mutations affect Glycinergic Inhibitory Synaptic Signalling?

[Professor Fred Meunier](#)

- Imaging Single Molecules Underlying Brain Cell Communication and Survival

Dr Michael Piper

- The Role of NSD1 in the Developing Brain

Professor Linda Richards

- Activity-dependent Mechanisms Regulating the Development of the Corpus Callosum
- Development of Interhemispheric Connections in Marsupials
- Formation and Function of Glial Populations at the Cortical Midline
- Nuclear Factor One Regulation of Proliferation and Differentiation Cortical Development
- Nuclear Factor One Genes in Brain Cancer

DIAMANTINA INSTITUTE - www.di.uq.edu.au

For a full list of Honours projects please visit the Diamantina Website:

<http://www.di.uq.edu.au/Docs/Research%20Profiles%20and%20Projects%20-%202017.pdf>

MATER RESEARCH INSTITUTE – www.mmri.mater.org.au

Dr Jakub Begun

Group: Inflammatory Bowel Disease

- Examining the mechanism of colitis associated cancer prevention by thiopurines using *in vitro* and *in vivo* models.

Keywords: Inflammatory bowel disease, colorectal cancer, colitis, thiopurines, translational research

- Developing an oral cytokine based treatment of inflammatory bowel disease using a nanoparticle delivery system.

Keywords: Inflammatory bowel disease, nanoparticles, cytokines, translational research, colitis

Dr Paul Dawson

Group: Developmental Disorders

- Investigating the molecular genetics of neurodevelopmental Disorders including Autism and Intellectual Disability.

Keywords: Autism, Intellectual Disability, Neurodevelopment, Genetics, Paediatric

- Understanding the neuroprotective benefits of genetics and nutrition for babies born preterm.

Keywords: Preterm birth, genetics, cerebral palsy, neurodevelopment, nutrition

Dr Adam Ewing

Group: Genome Plasticity and Disease

- Understanding transposable element regulation through combined computational and molecular approaches

Keywords: retrotransposons, genomics, bioinformatics, machine learning, cell biology

- Functional evaluation of new gene formation among mouse strains

Keywords: mouse, genomics, evolution, data mining, RNA-seq

Available Honours Projects

- Automated parameter tuning for mutation detection algorithms

Keywords: bioinformatics, machine learning, simulation, mutation, methods

[Dr Patricia Carreira](#)

Group: Genome Plasticity and Disease

- Necessity of colony stimulating factor-1 receptor expression in macrophages for tissue regeneration post immune challenge.

Keywords: haematopoietic stem cells; immune resilience; tissue regeneration.

[A/Prof John Hooper](#)

Group: Cancer Cell Biology

- Working within collaborative multi-disciplinary research teams to understand and target molecular drivers of late stage ovarian, colorectal and prostate carcinoma

Keywords: late stage ovarian, colorectal, prostate carcinoma

[Dr Allison Pettit](#)

Group: Bones and Immunology

- Dissection of macrophage contributions to maintenance and reformation of blood stem cell niches in the bone marrow.

Keywords: macrophages, stem cell niches

- Necessity of colony stimulating factor-1 receptor expression in macrophages for tissue regeneration post immune challenge.

Key words: haematopoietic stem cells; immune resilience; tissue regeneration.

[Dr Amirali Papat](#)

Group: Inflammatory Disease Biology and Therapeutics

- Targeting intestinal inflammation using stimuli responsive nano particles

Keywords: Nanoparticles, drug delivery, inflammatory bowel disease, colorectal cancer

[Prof Josephine Forbes](#)

Group: Glycation and Diabetes

- Sugar modifications in the regulation of mitochondrial energy production

Keywords: mitochondrial

[A/Prof Kristen Radford](#)

Group: Cancer Immunotherapies

- Targeting Human dendritic cells for cancer immunotherapy

Keywords: dendritic cells, cancer immunotherapy

Students interested in pursuing an Honours Project in Public Health can contact the Honours Coordinator at enquiries@sph.uq.edu.au

SCHOOL OF PHARMACY- www.uq.edu.au/pharmacy/tom-gonda

Professor Tom Gonda

- Targets and regulation of the *MYB* oncogene in leukaemia and breast cancer

UQ CENTRE FOR CLINICAL RESEARCH – www.uqccr.uq.edu.au

Dr Jun Yan

- Investigation of NF- κ B pathway in MIS416 treated people with secondary progressive multiple sclerosis

Please find the titles of all projects for Honours Students at UQCCR on this link:

<http://www.uqccr.uq.edu.au/students/phd-honours-projects.aspx>

UQ THORACIC RESEARCH CENTRE - www.metronorth.health.qld.gov.au

Prof Kwun Fong

Lung and thoracic cancer including: genomics and biomarkers, personalised treatment, diagnostic health techniques (including Digital Tomosynthesis (DT); Computed Tomography (CT) screening; Volatile Organic Compounds (VOCs) and Bronchoscopy, telehealth and prevention.

Research topics:

- Genetic and environmental risk for lung cancer
- Early detection and screening to reduce lung cancer mortality risk stratification, attitudes to screening, cost-effectiveness
- Liquid biopsies for diagnosis, monitoring and biology of lung cancer treatment resistance
- Breath testing for lung cancer and VOC bio markers
- Exhaled breath novel biomarker
- Epigenetics and epigenomics for biology and clinical translation
- Advanced Bronchoscopy - electromagnetic Bronchoscopy, ultra fine Bronchoscopy
- Role of miRNA in lung disease
- Tumour heterogeneity and impact on outcomes
- Tissue Banking for research purposes
- Tissue microarray
- Novel technologies for diagnosis/prevention – Ion Torrent, digital PCR, Nanostring
- Immunotherapy biomarkers
- Optimal MDT practice
- Addressing the patient journey with patient centred care
- Telehealth for lung cancer assessment and enabling high value care
- Improving the cost effectiveness of lung cancer treatments
- Big data for improving outcomes
- TNM staging enhancements
- Combining molecular analysis and classics histomorphology

Available Honours Projects

- Smoking cessation optimisation
- Comorbid disease - CAC during screening
- Secondary prevention after lung cancer treatments

[Assoc/Prof Rayleen Bowman](#)

Mesothelioma, including: genomics and biomarkers, and personalised treatment

Research topics:

- Mesothelioma - imaging and diagnosis
- Liquid biopsies for diagnosis
- Role of genomics in diagnosis and monitoring
- Role of exosomes
- Cell culture models of mesothelioma
- Inter and intratumoral heterogeneity

[Prof Ian Yang](#)

Chronic lung and airways diseases, including: Asthma, COPD, respiratory diseases linked to environment exposure, genomics and biomarkers of susceptibility and personalised treatments.

Research Topics:

- Air pollution and biodiesel in lung disease
- Air liquid culture models
- Individual susceptibility to COPD and asthma
- Telehealth
- Deconstructing unspecified dyspnoea for improved patient journeys
- Genomics of COPD
- Novel antibiotic treatment in asthma
- VOC and exhaled breath biomarkers
- Sputum biomarkers to guide treatment
- COPD inflammation and immunity pathway derangement
- Multi morbidity in COPD

GALLIPOLI MEDICAL RESEARCH INSTITUTE - www.gallipoliresearch.com.au

[Dr Christopher Layton](#)

- Diabetic retinal neuropathy as a precursor of diabetic retinopathy
- The role of erythropoietin in diabetic retinopathy and diabetic retinal neuropathy
- Retinal insulin receptors: trophic effects and effects on glucose metabolism in health and diabetes
- Cellular and molecular mechanisms of diabetic retinal neuropathy in photoreceptors

AUSTRALIAN INSTITUTE FOR BIOENGINEERING AND NANOTECHNOLOGY – www.aibn.uq.edu.au

Please find the titles of all projects for Honours Students at AIBN on this link:

<http://www.aibn.uq.edu.au/honours>

Critical Care Research Group - www.ccr.org.au

Prof John Frazer

- Understanding the role of cytokines in septic “auto-cannibalism”
- Impact of sepsis on endothelial glycocalyx (EG)
- Inhibition of endothelin-1 in inflammation and protein oxidative damage

Please contact Dr Jacky Suen j.suen1@uq.edu.au for further discussion.