THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

CREATE CHANGE

Researcher Profiles and Projects

The Frazer Institute 2025

The Frazer Institute at The University of Queensland is a leading research centre focusing on cancer, immunology, and skin. It is best known for delivering impactful health solutions based on excellence in basic science, exemplified by the development by Prof Ian Frazer AC of the Gardasil cervical cancer vaccine which has saved millions from cancer.

As part of the Faculty of Health Medicine and Behavioural Sciences, the Frazer Institute is situated in the Translational Research Institute (TRI), strongly linked to the Princess Alexandra Hospital site in Woolloongabba, on the UQ Dutton Park campus, a short bus ride away from the St Lucia campus. TRI provides world-class research facilities for commercialisation and the translation of scientific discoveries to the clinic.

We welcome students who wish to carry out undergraduate, honours or higher degree research projects with our world-leading biomedical researchers. We also offer training opportunities in research translation to the clinic, business development and commercialisation. Join our thriving student group who will welcome you to our Institute!

Kiarash Khosrotehrani
Director, Frazer Institute

- Career development
- Collaborative
- Clinical exposure
- Incredible facilities
- Cutting edge technology
- Mentorship
- Inclusive

Wendy Kao

PhD Student

"The Frazer Institute provides a supportive research community where HDR students are empowered to grow as both scientists and leaders. During my PhD journey, I've been involved in multiple collaborative projects and gained valuable skills that have strengthened my professional development. I have also taken on leadership roles, including serving as the HDR representative of the Dutton Park campus and as the Dutton Park campus representative in the UQ Union. Being part of the Frazer Institute means joining a community committed to collaboration, innovation, and excellence.."

Marion Barros

PhD student

"Honours at the Frazer Institute is an unforgettable experience in an environment focused on collaboration, translational research, and modern technology. As students we are given the unique opportunity and space to contribute to high end research with real world implications. The regular seminars, training programs in laboratory and career development settings, and daily interactions with academics and peers foster a culture of ideas, learning, and success."

Daniel Butcher

PhD Student

"It is a fantastic institute that allows leading scientists to collaborate daily, sharing opportunities, resources and most importantly, ideas. Being surrounded by world- leading experts and exceptional facilities makes it easy to excel and produce ground-breaking research."

The Frazer Institute

Renamed from the UQ Diamantina Institute in late 2022, The Frazer Institute is a modern research facility where clinical and basic science are used to study cancer, immunology and dermatology.

The Institute has a vibrant community of over 300 researchers, students and support staff. We have delivered global, world-changing discoveries to humanity, such as the world's first cervical cancer vaccine.

Based at the Translational Research Institute (TRI) beside the Princess Alexandra Hospital, it has strong clinical interactions and world-class facilities that enable researchers to be at the forefront of their fields. The Frazer Institute's position within the TRI allows for a much greater collaborative research environment, allowing our researchers to focus their efforts on turning their scientific discoveries into new treatments for diseases including a variety of cancers, arthritis and other autoimmune diseases.

The Frazer Institute focuses on bringing the discoveries of basic science to the patient.

We aim to translate the greatest opportunities for research discoveries into the cause, mechanism, prevention and treatment of major disease.

As part of The University of Queensland's prestigious Faculty of Health, Medicine and Behavioural Sciences (HMBS), The Frazer Institute is committed to making a global difference to health outcomes.

Key research themes:

Cancer

Immunology

Dermatology

For further information visit the Frazer Institute website:

Undergraduate research projects

The Frazer Institute offers various opportunities for undergraduate students to gain research experience in biomedical research facilities including Summer and Winter research projects.

For further information visit *frazer.uq.edu.au/study/undergraduate*

Summer research projects

For further information visit: *medicine.uq.edu.au/research/research-strategy-and-support-office/summer-research-program*

Winter research projects

For further information visit: *medicine.uq.edu.au/research/research-strategy-and-support-office/winter-research-projects*

In July of each year The Frazer Institute offers a one-week course in advanced immunology.

For further information visit: *https://frazer.uq.edu.au/event/2293/advanced-immunology-course*

Honours program

The Frazer Institute hosts honours students enrolled through other schools within the Faculties of Science or Medicine at UQ or affiliated Institutions. These include the School of Chemistry and Molecular Biosciences, or the School of Biomedical Sciences at UQ.

The Honours Program is a one-year full time course. Students must fulfill the prerequisites of the undergraduate Faculty/School through which they are enrolled.

For further information visit: *frazer.uq.edu.au/study/honours*

MD student research experience

UQ Medicine is committed to enhancing the research training and experience for students in the Medical Program.

There are a number of ways students can incorporate research training and experience into their medical degree.

Forfurther information visit: *medicine-program.uq.edu.au/research/research-your-medical-degree*

Research higher degree

The Frazer Institute is an internationally recognised research facility where clinical and medical sciences converge in the translational research of cancer, disorders of immune regulation and genomic medicine.

For more information on starting a Higher Degree by Research with us, please visit: *medicine.uq.edu.au/future-students#qt-study-foundation-tabs-4*

Dr Lauren Aoude

Research Field

Cancer genomics and precision medicine

Research Synopsis

Our research program explores barriers to precision oncology in oesophageal cancer and melanoma. Our research goal is to better inform treatment decisions and improve health outcomes for patients through the integration of genomics into the clinic. We integrate genomic sequencing data with various clinical information, including pathological and imaging information. Our work aims to establish more accurate prognostics to enhance therapeutic options for these patients. Recent work has included the establishment of 3D patient-derived organoid models to enable a personalised medicine approach in oesophageal cancer.

Research Projects

- Using patient derived organoid models in the search for novel molecular targets for personalized treatments in oesophageal cancer
- Targeting DNA replication stress to overcome melanoma therapy resistance using single cell high throughput phenotypic analysis

E l.aoude@uq.edu.au

P 07 3443 6959

W about.uq.edu.au/experts/15442

Cancer

Professor Gabrielle Belz

Research Field

Transcriptional regulation of immune cell development and memory formation in pathogen defence and mucosal immunity

Research Synopsis

Our work aims to understand how the immune system responds to infections including viruses, bacteria and parasites.

We are investigating how different types of immune cells develop, and what factors influence their decision to become one type of immune cell or another to mediate long term immune protection.

Understanding how the body deals with pathogens will give clues about how to enhance protective immunity. Our goal is to discover new therapies that boost our immune system to protect against infection.

Research Projects

- Identifying novel functions of innate lymphoid cells and NK cells in immune protection
- Unravelling the microbiome-epithelial-immune interface protecting mucosal surfaces
- Elucidating the mechanisms responsible for the generation of protective immunity in response to lung and gastrointestinal pathogens

E g.belz@uq.edu.au

P 07 3443 8026

W researchers.uq.edu.au/researcher/25382

Immunology

Dr. Anne-Sophie Bergot

Research Field

Autoimmunity, T cells, myeloid cells, gut bacteria and the pathogenesis of spondyloarthritis.

Research Synopsis

Ankylosing spondylitis is a debilitating disease affecting spine, large joints, eyes and gut. Although the underlying causes are not known, 70% of patients have an inflamed gut. Our preliminary studies suggest an immune response to gut bacteria drives disease development. In the gut, cells called macrophages that are meant to clear invasive bacteria seem to do it inefficiently. This leads to the transport of non-cleared bacteria or bacterial extracellular vesicles (BEVs) to the site where arthritis starts. In the joints, macrophages present bacteria motifs to T cells that become activated, initiating local inflammation.

Research Projects

- Characterisation of bacteria-specific T cells in germ-free SKG mice reconstituted with specific bacteria: which antigens do they recognise? Can we track these T cells in vivo?
- Characterisation of bacteria-carrying myeloid cells in SKG mice: why are they not clearing the bacteria? Can we restore this defective function?
- Studying of the role of bacterial EVs in the development of the disease. What is their content (proteins, nucleic acids, immunogens?)

E a.bergot@uq.edu.au

P 07 34434316

W about.uq.edu.au/experts/2335

Immunology

Professor Antje Blumenthal

Research Field

Innate immunity and infectious diseases

Research Synopsis

With resistance to antibiotics on the rise, new insights into host defence mechanisms that control pathogenic bacteria are vital for the development of novel therapeutic interventions. Our research focuses on molecular pathways that are important for the recognition and control of bacterial pathogens as well as those that orchestrate inflammatory responses during infection.

Students are part of a dynamic research team to maximise their research training and experience. The research employs a series of molecular, cell biological and immunological techniques to define novel molecular and cellular aspects of the host response to infection.

Research Projects

- Innate immune recognition of pathogenic bacteria
- Molecular regulation of host anti-microbial defence mechanisms

E a.blumenthal@uq.edu.au

P 07 3443 6984

W researchers.uq.edu.au/researcher/2366

Immunology

Dr. Janin Chandra

Research Field

Cancer immunology and immunotherapy.

Research Synopsis

Our lab is focused on understanding immune recognition and elimination of cancer cells, with a particular focus on antigen processing and presentation. Antigen presentation of cancer cell-derived molecules is critical for the activation of cancer cell-directed effector T cell responses. This process is typically carried out by professional antigen presenting cells such as dendritic cells and macrophages. Cancer-mediated dysregulation of these cells can lead to an absence of immune recognition, or a suppression of effector T cell responses. Understanding the cellular interplays between immune cells and cancer cells is critical towards the development of new and effective cancer immunotherapies.

Research Projects

- To determine a role for cancer and stromal cells in antigen-presentation and T cell activation
- To identify early mechanism of immune cell dysregulation in an emerging malignant microenvironment.

E j.chandra@uq.edu.au

W about.uq.edu.au/experts/2717

Cancer

Dermatology

Immunology

Dr. Zhian Chen

Research Field

Molecular mechanisms controlling vaccine response and anti-tumour immunity

Research Synopsis

Upon exposure to invading pathogens, the immune system orchestrates specialised responses to generate protective antibodies—a complex process involving diverse immune cells and critical chemical messengers known as cytokines. In parallel, in the contexts of chronic infections and cancers, immune cells often succumb to a dysregulated state termed "exhaustion," limiting their ability to eliminate infected or cancerous cells. Our newly established research team is dedicated to unravelling how immune cells undergo various functional sub-population differentiations. We are particularly focused on addressing two key questions within the immune system:

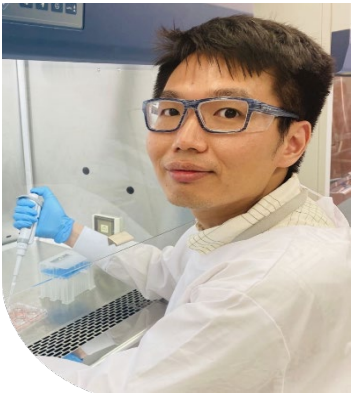
1. The origins of long-lived antibody responses post-vaccination and infection.

2. The mechanisms to sustain immune cell functionalities and combat exhaustion.

Our goal is to uncover novel molecular mechanisms controlling vaccine response and anti-tumour immunity, offering new opportunities for improved vaccine and therapeutic development.

Research Projects

- Deciphering new molecular mechanisms that regulate key cytokine signaling in immune cell differentiation and function
- Understanding how cytokines contribute to the finely-regulated immune cell selection in vaccine response
- Unraveling novel pathways sustaining T cell immunity in cancers and developing cytokine-based immunotherapeutic.



E z.chen@uq.edu.au

P 0406 641 223

W researchers.uq.edu.au/researcher/26487

Immunology

Dr. Jazmina Gonzalez Cruz

Research Field

Cancer immunology

Research Synopsis

Immunotherapiesherald a new erafor management and treatmentof solid tumours.Immunecheckpoint inhibitors (ICI) are now in use to treatradio-resistant and recurrent Oropharyngeal Squamous cell Carcinomas (OPSCC). Unfortunately, only 20% of these patients benefitfrom ICI therapy. My research group aims to answer 3 questions: why 80% of OPSCC patients failed ICI therapy? Which factors define and contribute to the success of 20% of those patients? And can we use these findings to stratify and select better treatments for OPSCC patients? To do so, my group is profiling the blood and tumours of OPSCC patients with high-throughput technologies, such as 10X Genomics Spatial Visium, Nanostring DSP GeoMX, CODEX and multiparametric flow cytometry. The correlation of each patient's disease profile with their clinical history will help us to predict the likelihood of future patients to respond to treatment and will assist in the selection of tailored approaches based on each patient's own disease characteristics.

Research Projects

- High-resolution mapping of head and neck cancers to define the cancer/immune system interface.
- Generation of a preclinical humanized skin graft model to expedite novel cervical cancer therapies.
- A phase 2 study of de-escalation in cutaneous squamous cell carcinoma with the use of neoadjuvant Pembrolizumab
- Enhancing tumour immune detection by targeting replication stress.
- Characterization of peripheral CD4+CD8+ T cells.
- Local use of Immunotherapies to treat cutaneous squamous cell carcinoma in organ transplant patients.

E j.gonzalezcruz@uq.edu.au

P 0478 912 737

W researchers.uq.edu.au/researcher/12673

Cancer

Immunology

Associate Professor Fernando S.F. Guimaraes

Research Field

NK cell biology and immunotherapy

Research Synopsis

Natural killer (NK) cells can recognise and respond to tumour cells through a broad range of inhibitory and activating receptors. The regulation of these responses emerges from the integrated balance of activating and inhibitory signals at the NK cell-tumour interface, which help NK-cells discriminate between altered target cells (cancer or pathogen-infected cells) and healthy cells. However, both cancer cells and pathogens can still evade NK cells' detection and killing action. My research focus is to develop effective therapies that maximise NK cell responses—an emerging field with great potential for applications in the clinical management of disseminated cancer and sepsis prevention. For example, my work has uncovered that members of the Transforming Growth Factor (TGF) beta superfamily are potent inhibitory checkpoints of NK cell function. Their presence within the tumour microenvironment and infection sites can lead to tumour immunity and sepsis, respectively. This knowledge is opening a new paradigm for developing cancer and infection immunotherapy approaches. My vision is to build from this discovery and other advances in the field to generate a novel pipeline of cell immunotherapies both "targeting" NK-cells and "based on" NK-cells to increase NK-cells function against cancer (e.g., anti-metastatic function) and sepsis.

Research Projects

- Developing and tailoring NK cell-based cancer immunotherapies
- Deciphering regulatory signalling pathways in NK cells
- Elucidating the role of NK cells in inflammatory disorders

E f.guimaraes@uq.edu.au

P 07 3443 7049

W frazer.uq.edu.au/research/guimaraes-group

Immunology

Professor Nikolas Haass

Research Field

Melanoma cell biology and experimental melanoma therapy

Research Synopsis

Using cutting-edge technology, including real-time cell cycle and cell death imaging in several three-dimensional cell culture and in vivo models, we investigate the biology of tumour heterogeneity as well as the immune environment with the goal to develop novel therapeutic approaches by overcoming drug resistance.

Research Projects

- Targeting melanoma plasticity to improve both targeted and immune therapy
- Targeting melanoma invasion and metastasis to improve both targeted and immune therapy
- Overcoming Immune Checkpoint Inhibitor Resistance to Improve Melanoma Therapy
- Defining molecular signatures that orchestrate tumour subpopulations in melanoma models mimicking tumour microenvironment and drug tolerance
- Mathematical modelling of 4D multicellular melanoma spheroids (joint project with Professor Matthew Simpson, QUT)

E n.haass1@uq.edu.au

P 07 3443 7087

W researchers.uq.edu.au/researcher/2966

Dermatology

Immunology

Professor Emma Hamilton- Williams

Research Field

Microbiota and immune therapy development for type 1 diabetes

Research Synopsis

Autoimmune type 1 diabetes (T1D) is increasing in Western countries. Approaches are urgently needed to prevent or reverse the autoimmunity leading to T1D. Our lab aims to decipher whether the gut microbiota is a key factor that can either accelerate or delay autoimmune diabetes via modulating gut function and immune regulation. We aim to harness the microbiota to design preventative therapies for T1D. We also study the immune mechanisms that control a loss of T-cell tolerance and are developing immunotherapies to halt or reverse the autoimmune process.

Our lab uses human clinical samples from longitudinal cohort studies and clinical trials to investigate the response of the microbiota or immune system to intervention with sophisticated 'omics and bioinformatic approaches. We use germ-free mice and microbiota transfer models to study how changes in the microbiota impact autoimmunity. We use nanoparticle technology to deliver an immunotherapy that specifically tolerises the immune cells that cause T1D. We are using humanised animal models and CRISPR/Cas9 gene editing to study the impact of this therapy on the T-cell populations that cause disease.

Research Projects

- Identifying microbial metabolites that can protect from type 1 diabetes
- Using CRISPR/Cas9 targeting to understand T cell tolerance in type 1 diabetes
- Improving antigen-specific immunotherapy for type 1 diabetes

E e.hamiltonwilliams@uq.edu.au

P 07 3443 6989

W researchers.uq.edu.au/researcher/2724

Immunology

Dr. Colm Keane

Research Field

Immune Responses in B cell lymphoma

Research Synopsis

The Keane Lab is focused on the interface between the tumour microenvironment and the malignant lymphoma cell, with a goal to build an understanding of lymphoma from an immunological and biomarkers perspective. To bridge developments between the clinic and bench-top, the laboratory has a strong emphasis on patient material, which it obtains from international and national clinical collaborators, much being from investigator-led clinical trials. Lymphomas studied include more common lymphomas such as Hodgkin Lymphoma, Diffuse Large B-cell Lymphoma and Follicular Lymphoma but the lab has a particular focus on rare lymphomas such as primary central nervous system lymphoma and lymphomas that develop in patients who are immunocompromised.

The goals of the lab are to directly improve outcomes for all lymphoma patients by performing innovative translational science that not only generates new knowledge and brings new treatments to Australian patients but helps to train the next generation of lymphoma researchers in Australia.

Research Projects

- Immune responses in Primary Central Nervous System Lymphoma
- Assessment of immune changes following treatment with immune checkpoint therapy in clinical trials
- Spatial transcriptomics to understand immune response in lymphoma

E c.keane@uq.edu.au

P 07 3443 7912

W researchers.uq.edu.au/researcher/5470

Cancer

Immunology

Professor Kiarash Khosrotehrani

Research Field

Skin cancer

Research Synopsis

Skin cancers represent the most common human malignancy. Through a common etiopathology, eg sun exposure, cancers of the skin such as melanoma, basal or squamous cell carcinoma are formed from mutant clones of skin cells and may progress to metastasis.

Our lab's efforts focus on limiting the progression of sun-damaged skin towards keratinocyte cancers such as basal and squamous cell carcinoma. However once these cancers or melanomas are formed, our lab tries to understand the molecular events leading to their dissemination through blood vessels.

Research Projects

- To understand the role of endothelial to mesenchymal transition in tumour progression and dissemination using single and spatial Omics
- To understand the changes in photodamaged skin environment leading to skin cancer formation
- To compare tumours from patients who have died from melanoma versus those who have survived using spatial transcriptomics

E k.khosrotehrani@uq.edu.au

P 07 3443 7088

W researchers.uq.edu.au/researcher/2078

Dermatology

Dr. Arutha Kulasinghe

Research Field

Immuno-oncology, spatial biology

Research Synopsis

Immunotherapies have led to long-term benefit across a number of solid cancers including lung, skin, and head and neck cancer. However, only a subset of patients appears to benefit from this therapy. Our lab uses cutting edge spatial biology and cellular mapping tools to identify tissue-based signatures of response to therapy.

Research Projects

- To develop biomarkers associated with response and resistance to immunotherapy in head and neck cancer
- To develop a multiomic cellular atlas of immunotherapy resistance/ response in head and neck cancer

E arutha.kulasinghe@uq.edu.au

W researchers.uq.edu.au/researcher/29167

Cancer

Immunology

Dr Snehlata Kumari

Research Field

Immunomodulatory signalling mechanisms regulating inflammation

Research Synopsis

Our work is focused on elucidating immuno-modulatory signalling mechanisms regulating inflammation to develop new therapeutic strategies for inflammatory skin diseases and cancer. The skin forms immunological, mechanical and structural barrier to protect the organisms from external challenges. Active communication between soluble factors and cells in the skin, such as epithelia, stromal and immune cells are crucial to maintain skin homeostasis. We have previously shown that NF-kappaB, cytokine and cell death signalling pathways are crucial in regulating inflammation. We aim to deciphering novel signalling pathways and mechanisms in immune and non-immune cells in regulating skin inflammation and cancer. The project provides excellent exciting opportunity to students to learn and engage in techniques in Immunology, Molecular Biology, Cell Biology and Genetics including microscopy, CRISPR/Cas9-mediated genetic engineering, flow cytometry as well as in vitro and in vivo models.

E s.kumari@uq.edu.au

W researchers.uq.edu.au/researcher/25389

Dermatology

Associate Professor Jason Lee

Research Field

Cancer epigenetics

Research Synopsis

As cancer and many diseases arise from a combination of genetic propensity and the response of cells to external factors mediated through changes to the expression of key genes, it is important to understand epigenetic regulation. However, very few drugs targeting epigenetic modifiers have been successful, in part due to the lack of effective means to select the patient group in which they will be most effective. Understanding the role of these enzymes in cancer progression using patient-derived samples will aid in improving existing therapies and potentially identify new targets for treatment. Epigenetics and Precision Medicine Laboratory studies the molecular epigenetic alterations, which underlie the therapy resistance and metastatic progression of cancer. It has a particular interest in difficult to treat solid tumours including therapy-resistant pancreatic, ovarian tumours and metastatic melanoma. The laboratory has now developed animal models and patient-derived organoid models to test novel drugs and strategies. Importantly, our approach to cancer drug development is informed by understanding the tumour microenvironment using multi-omics analyses (transcriptome, proteome and metabolome). We utilise-cutting-edge translational experiments using materials from ongoing clinical trials to understand mechanisms and develop better drugs.

Research Projects

- Enhancing immunotherapy response by targeting epigenetic enzymes
- Developing early detection biomarkers for pancreatic cancer
- Targeting non-coding RNAs to boost immunotherapy response in cancer

E Jason.s.lee@uq.edu.au

P 3443 7483

W about.uq.edu.au/experts/7721

Cancer

Dermatology

Immunology

Associate Professor Aideen McInerney-Leo

Research Field

Translating genomics into clinical practice

Research Synopsis

I am a clinician-academic whose interactions with patients have shaped my research questions and fuelled my enthusiasm for the importance of clinical research. I trained as a genetic counsellor and my research now focuses on the integration of genomics into clinical care. My research program has had three primary themes: evaluating the psychosocial impact of genetic conditions and/or genetic testing; evaluating genetics education preferences for patients and healthcare providers; and using next-generation sequencing to increase diagnostic yield for rare disorders.

Research Projects

- Exploring whether genetic fatalism affects sun-related health behaviours in high-risk individuals following genetic testing
- Evaluating the efficacy of videos to promote informed consent for genetic testing
- Mainstreaming Genetic Testing for Melanoma into Dermatology Practice. Empowering ethics committees to review
- genomics applications.

E a.mcinerney@uq.edu.au

P 07 3443 7957

W researchers.uq.edu.au/researcher/23291

Dermatology

Professor Mark Morrison

Research Field

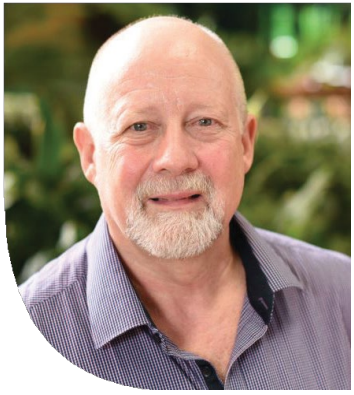
Microbial Biology and Metagenomics

Research Synopsis

My lab group studies the role(s) of the gut microbiome in health and disease, particularly in relation to inflammatory bowel diseases and disorders of gut-brain interaction. To do that, we utilise techniques from microbial culture through to (meta)genomics and bioinformatics, to characterise how the specialised communities' adherent to mucosal surfaces are involved with the onset (or protection) from these conditions. We also work collaboratively on projects exploring how the gut microbiome might impact other body sites, such as the lung and skin.

Research Projects

- How do food additives affect the gut microbiome in Crohn's disease and health.
- The role of diet x microbiome interactions in disorders of gut-brain interaction.
- Bringing microbial genomes to life - new drugs from new bugs.



E m.morrison1@uq.edu.au

P 07 3443 6957

W researchers.uq.edu.au/researcher/4157

Dermatology

Immunology

Associate Professor Fiona Simpson

Research Field

Cancer immunotherapy

Research Synopsis

The laboratory is developing adjuvant / combination therapy to improve efficacy of treatment for monoclonal antibody therapy and to decrease innate and acquired resistance. Consequently the laboratory also has cell biological projects on immune cell trafficking, proteins involved in biogenesis of the immunological synapse and monitoring of immune responses during therapy and tumour regression.

Research Projects

- Combination therapies to improve monoclonal antibody therapy outcomes
- Cell biological mechanisms of biogenesis of the immune synapse

E f.simpson@uq.edu.au

P 0422 721 656

W researchers.uq.edu.au/researcher/896

Dermatology

Immunology

Professor Michael Stowasser

Research Field

Endocrine forms of human hypertension

Research Synopsis

Michael Stowasser studies the pathogenesis and management of hypertension (HT), and especially endocrine varieties such as primary aldosteronism (PA). He helped demonstrate that PA is 10 times more common than previously thought and accounts for ~10% of HT, making it the commonest specifically treatable variety, and in the description of a new familial form (FH-II) which facilitated elucidation of its genetic basis. His group has one of the largest series (>2000) worldwide of patients with PA who have been meticulously studied and documented, helping it to become recognized as an authority on pathogenesis, diagnostic workup and management of PA. It developed and validated the seated saline suppression test which has since become the favoured method for confirming the diagnosis of PA in Australia and a growing number of overseas institutions. It has also contributed to understanding how various physiological and pharmacological factors affect the aldosterone/renin ratio as a screening test for PA and in optimizing approaches to adrenal venous sampling, the most reliable method of differentiating unilateral (surgically curable) from bilateral varieties. The group was recently one of six funded by a Leducq Foundation Transatlantic Networks of Excellence Program Grant examining how potassium lowers blood pressure.

Research Projects

- Validation of immunohistochemistry in the diagnosis of primary aldosteronism and concurrent autonomous cortisol production
- Optimizing detection, diagnostic workup and management of primary aldosteronism
- Potassium in hypertension

E m.stowasser@uq.edu.au

P 07 3176 2694

W researchers.uq.edu.au/researcher/20

Clinical translation

Professor H. Peter Soyer

Research Field

Early detection of melanoma

Research Synopsis

Professor Soyer is an internationally renowned academic dermatologist with over 30 years experience in the field with special expertise in preventative dermatooncology, dermatopathology and dermatologic imaging. His main research focus is skin cancer (both melanoma and keratinocyte skin cancer), with a particular interest in early detection strategies and expanding the concept and applications of teledermatology and teledermoscopy. He is Chief Investigator of the CRE for the Study of Naevi was awarded an NHMRC Partnership Grant to implement an innovative 3D teledermatology network for the early detection of melanomain high-risk individuals. He was awarded a MRFF Practitioner Fellowship, Next Generation Clinical Researchers Program. Most recently he obtained funding from the Australian Cancer Research Foundation (ACRF) to establish the Australian Centre of Excellence in Melanoma Imaging & Diagnosis (ACEMID). ACRF ACEMID will enable establishment of 15 3D total body imaging systems, linked by a telemedicine network, across Australia's eastcoast, and facilitate research in the early detection of melanoma.

Research Projects

- Australian Cancer Research Foundation (ACRF) Australian Centre of Excellence in Melanoma Imaging and Diagnosis (ACEMID)
- NHMRC Collaborative European Union grant: Intelligent total body scanner for early detection of melanoma
- Automated Objective deep phenotype for melanomariskfactors from 3D total body imaging
- Validation of AI software for lesion diagnosis and change detection

E p.soyer@uq.edu.au

P 07 3443 8017

W researchers.uq.edu.au/researcher/1918

Dermatology

Associate Professor Mitchell Stark

Research Field

Melanoma/skin cancer genomics and biomarker discovery

Research Synopsis

My research group is based within the Dermatology Research Centre and our overall theme is identifying biomarkers for the early detection of melanoma and skin cancers. By preventing melanoma/skin cancer formation in its earliest stages, we can effectively put the brakes on and halt the formation of metastatic disease. At the other end of the spectrum, late-stage melanoma patients are currently being treated with effective therapies but unfortunately this doesn't apply to everybody. By investigating the clinical utility of predictive and prognostic 'liquid biopsy' biomarkers, we aim to improve the overall efficacy of current therapies.

Together with our biomarker discovery, we are also currently creating a "pre-cancer" atlas of overlapping genomic data (exome, RNA-seq, methylation) from skin and naevi to identify novel mechanisms for melanoma development which may provide avenues for potential therapeutic intervention.

Research Projects

Projects may include topics related to:

- Melanoma and Naevi genomics and transcriptomics
- MicroRNA analysis of the progression of early skin lesions toward SCC
- Predictive and prognostic biomarkers for melanoma brain metastasis
- Functional validation of molecular pathways involved in Seborrhoeic Keratosis development

E m.stark@uq.edu.au

P 07 3443 8027

W researchers.uq.edu.au/researcher/12961

Dermatology

Professor Ranjeny Thomas

Research Field

Autoimmune disease

Research Synopsis

Joint inflammation, particularly in the synovial tissue, is a classic manifestation of rheumatoid arthritis (RA). T cells accumulate in the synovial tissue where they interact with antigen- presenting cells and provide help to support B cell-driven autoantibody production. But what drives autoimmune inflammation in RA

synovial tissue, which cells contribute and how? We are studying this using joint synovial tissue biopsies from newly diagnosed RA patients, spatial transcriptomics and proteomics, immunopeptidomics and assays of T cell function. We also have constructed some innovative animal models. We aim to build novel discovery tools and to design interventions targeting the pathogenetic processes driving RA.

Research Projects

- Characterising remission vs non-remission in response to treatment in rheumatoid arthritis
- Discovering how oral bacterial antigens are involved in driving RA

E ranjeny.thomas@uq.edu.au

P 07 3443 6960

W researchers.uq.edu.au/researcher/396

Immunology

Professor Brandon Wainwright

Research Field

Developing new therapies for paediatric brain cancer

Research Synopsis

Brain cancer is the most common cause of cancer-related death in children. Since the establishment of core radiotherapy and chemotherapy approaches around 25 years ago overall survival has not improved at all despite many clinical trials. Additionally, for those children who survive they commonly suffer serious long term side effects of the treatment itself. Therefore, there is an urgent need for better treatments to improve survival, and to discover approaches to both prevent and treat the side effects of therapy.

The Wainwright laboratory discovered the first gene known to cause brain cancer in children. Since then, we have focused on defining the cells of origin of the disease, the genetic pathways that lead to tumour growth and metastasis, and the development and testing of new therapies. Our approaches include cell biology, developmental neurobiology, genetics/genomics/bioinformatics and, increasingly, immunotherapies. We have strong and active clinical linkages locally, nationally and internationally and several projects that are either in the clinic or will be in the next 12 months.

Research Projects

- Manipulating the inflammatory response to reduce the side effects of chemotherapy and radiotherapy
- The discovery of genes which influence the response of medulloblastoma to radiotherapy
- Factors which regulate the blood-brain barrier and therapeutic effectiveness in brain cancer
- Attacking cell cycle regulation and the cytoskeleton in medulloblastoma – the molecular basis of response and drug resistance
- A liquid biopsy approach to monitoring molecular basis of therapeutic response and relapse in brain tumour patients.

E b.wainwright@uq.edu.au

P 07 3443 7093

W researchers.uq.edu.au/researcher/115

Immunology

Associate Professor James Wells

Research Field

Tumour immunology

Research Synopsis

Our group has 2 major areas of focus.

(1) Immune system recognition and destruction of squamous skin cancers.

We are investigating the mechanisms through which immune cells destroy tumours. Our goal is to determine how immune cells destroy tumours using animal models, so that we can correlate this information to patients in order to highlight appropriate points and strategies for immunotherapy.

(2) Tumor behavior that permits squamous skin cancers to evade host immunity.

Using genetically-linked regressor and progressor tumours, we are seeking to understand how a tumour modifies the immune system in order to become established. Our goal is to understand the key early immunological events that allow tumours to evade the immune system.

Research Projects

- Assessing mechanisms of immune-control for their role in mediating tumor regression
- Defining how tumours harness the immune system in order to establish themselves

E j.wells3@uq.edu.au

P 07 3443 6983

W researchers.uq.edu.au/researcher/2515

Dermatology

Immunology

Associate Professor Timothy Wells

Research Field

Host-pathogen interactions in chronic bacterial infections

Research Synopsis

Our laboratory focuses on the interactions between bacterial pathogens and the host immune response during bacterial infections with a focus on the lung.

Although antibody usually protects against infection, our laboratory has identified a specific type of 'cloaking antibody' that actually protects colonising bacteria from immune killing.

Patients with cloaking antibody were found to have worse lung function.

We aim to understand both the bacterial causes and the induction of the immunological response that leads to inhibition of bacterial killing.

We also have a keen interest in studying antibody-dependent enhancement in various bacterial infections by using a mixture of molecular microbiology, immunology and genomic approaches.

Research Projects

- Antibody-mediated enhancement of inflammation
- Impact of antibody response on phage therapy

E timothy.wells@uq.edu.au

P 07 3443 7050

W researchers.uq.edu.au/researcher/15250

Immunology

Dr. Tatiane Yates

Research Field

Genomics and health

Research Synopsis

Genomic testing is now an integral part of healthcare, enabling the diagnosis of rare conditions, informing risk assessments and tailoring personalised therapies. Despite the significant benefits, there are complex barries that prevent access to genomic testing within the health system. Our research seeks to address these challenges by facilitating the integration of genomic testing across the healthcare system. This includes developing innovative models of care, evaluating the ethical, legal, and social implications, and creating educational modules for healthcare professionals. Our approach leverages mixed-method research and draws on principles from psychology, health behaviour, and implementation science.

Research Projects

- Exploring the psychological impact of caring for a child with genetic condition affecting their immune system
- Developing novel recruitment protocols to improve ancestry diversity of individuals in genomics research
- Developing education for healthcare professionals to use personalised genomic medicine in clinical practice

E t.yanes@uq.edu.au

W about.uq.edu.au/experts/24916

Immunology

Professor Di Yu

Research Field

T-cell Immunology and Immunotherapy

Research Synopsis

In the lab of Systems and Translational Immunology Laboratory (STIL), Professor Di Yu and his team are investigating the molecular mechanisms and the landscape by which T cells control the competence and balance of the immune system, intending to design new strategies to modulate the immune system and to treat autoimmune and allergic diseases, infection and cancer. Our research ranges from those at the molecular level to animal disease models and human clinical trials, with the integration of the data-driven systems immunology approach.

Research Projects

- Protective and pathogenic function of cytotoxic T cells in infection and cancer
- The regulation of T cell-B cell interaction in vaccination and autoimmune diseases
- Cytokine-based immunotherapy
- Artificial intelligence-driven "systems immunology" approaches to understand the immune system and immune responses

E di.yu@uq.edu.au

P 07 3443 6954

W researchers.uq.edu.au/researcher/25123

Immunology

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Contact Us

T: +617 3443 7018

E: fi.admin@uq.edu.au

W: frazer.uq.edu.au/study

A: The Frazer Institute, Level 7, Translational Research Institute,

37 Kent Street, Woolloongabba Q Australia 4102

CRICOS Provider
00025B