The University Of Queensland
AUSTRALIA

CREATE CHANGE

Researcher profiles and projects

Centre for Clinical Research

2021/2022

Centre for Clinical Research

In partnership with the Queensland Government and major US Philanthropic organisation Atlantic Philanthropies, The University of Queensland developed the UQ Centre for Clinical Research (CCR) at the Royal Brisbane and Women's Hospital (RBWH) in 2008.

UQCCR is focused on bringing together leading health professionals, clinicians and scientists from around the globe to improve people's lives through patient-orientated – or 'bench to bedside' – research. This allows us to provide better treatment and results for patients, as well as adding to the body of knowledge about particular diseases or problems.

We are a world leader in innovative and multidisciplinary collaborative clinical research and our research is driven by the simple desire to improve patient care.

Clinical neuroscience

Up to one billion people worldwide suffer from some type of brain disorder - depriving them of a happy, fulfilling life. Our research in this area focuses on developing a better understanding of brain disorders, mental illness, movement disorders, demyelinating diseases and brain injury.

Fertility

Infertility is a significant condition affecting around one in six couples in Australia, and this number is rising. Our research focuses on developing a better understanding of the causes of infertility, including ageing, hormonal, environmental and developmental conditions.

We are one of only a handful of labs in the world applying state-of-the-art techniques including high-resolution imaging to study oocytes and embryos. The work seeks to better understand oocyte quality and how the ovarian reservoir is regulated with a view to developing novel technologies.

Infectious diseases

Our research links background data on bacteria with new approaches to identify risks and treatments for infections that are resistant to antibiotics. The results have substantial impacts globally, given the rapid speed of antibiotic resistant bacteria.

Cancer

Our researchers are at the forefront of advancements into cancer diagnostics and treatment.

For further information visit clinical-research.centre.uq.edu.au

Key research themes:

- Cancer
- Genomic medicine
- Clinical neuroscience
- Fertility
- Molecular microbiology
- Drug treatment
- Infectious diseases
- Prenatal science

Professor Anders Cervin

Research Field

Chronic sinus and ear infections

Research Synopsis

A primary focus of our research is to develop and test microbiome therapies that will reduce problematic infections in the sinus and ears. We also work to gather new knowledge on the microbiome of the upper respiratory tract. Our research project teams include ENT surgeons, microbiologists, nurses, molecular biologists, virologists, and health service providers.

Research Projects

- Testing the effectiveness of a sinonasal microbiome transplant therapy in patients with chronic sinus infections
- Testing the effectiveness of a bacterial probiotic therapy to reduce pathogenic bacteria in children with Aboriginal and Torres Strait Islander ancestry who are at risk for chronic ear infections

E a.cervin@uq.edu.au

researchers.uq.edu.au/researcher/8683

Professor Paul Colditz

Research Field

Perinatal Research

Research Synopsis

The Perinatal Research Centre (PRC), under the direction of Professor Paul Colditz, is committed to improving perinatal health through world class biomedical and clinical research. Our multidisciplinary research team aims to translate research advances into clinical practice and better health outcomes for mothers and babies.

The Perinatal Research Centre (PRC) specialises in translational research from pure science to playing a key role within the RBWH in clinical trials. The PRC has undergraduate students and postgraduate honours, masters and PhD students from a wide range of disciplines. Research at the PRC centres around several themes: Brain Research, Clinical Trials, Signal Processing and Systems Physiology Research.

Research Projects

In the PRC, active researchers are Dr Tracey Bjorkman (hypoxic-ischemic encephalopathy), Dr Julie Wixey (fetal growth restriction), and Dr Yvonne Eiby (preterm birth). Please contact them if you are interested in these projects.

E p.colditz@uq.edu.au
P 07 3346 6014

researchers.uq.edu.au/researcher/298

Dr Yvonne Eiby

Research Field

Cardiovascular and lymphatic physiology

Research Synopsis

We are focussed on protecting the developing brain of premature infants by understanding their unique cardiovascular physiology. To develop and test novel interventions to support preterm cardiovascular function we use the preterm piglet model of intensive care. Our studies include pre-clinical testing, electron microscopy of the microcirculation and assessment of brain injury using molecular and immunohistochemistry, coupled with assessment of medical records from preterm infants.

Research Projects

- Saving premature babies: the role of capillary ultrastructure in cardiovascular instability
- Neuropathology in preterm piglet brains

E y.eiby@uq.edu.au
P 07 3356 6010

researchers.uq.edu.au/researcher/1303

Associate Professor Carlos Salomon Gallo

Research Field

Biomarker discovery in Obstetrics and Gynaecology

Research Synopsis

Our program focusses on the development of extracellular vesicles (EV)-based biomarker for pregnancy complications and ovarian cancer. EV are membrane-bound nanovesicles (consisting of proteins, bioactive lipids, and RNAs) that transport molecular signals between cells, and are released from a wide range of cells, including the human placenta and tumour cells.

Research Projects

- Investigating the role of B7-H3 in ovarian cancer metastasis in-vitro
- Investigating miRNAs targeting antigen processing and presentation pathways in ovarian cancer
- High-throughput analysis of extracellular vesicle's phosphoproteome.
- Effect of lipoprotein depletion in the isolation of extracellular vesicle when using size exclusion chromatography.
- Investigating the molecular mechanisms of selective cargo packaging in exosomes and their implications in health and disease
- Investigating the therapeutic potential of extracellular vesicles as innovative drug delivery systems in pregnancy complications

E c.salomongallo@uq.edu.au
P 07 3346 6044

researchers.uq.edu.au/researcher/2833

Dr Richard Gordon

Research Field

Translational Neuroscience,
Microbiome and Drug Discovery

Research Synopsis

Our group is focused on identifying and validating novel therapeutic targets to slow progressive neurodegeneration in Parkinson's disease and other neurodegenerative disorders such as Motor Neuron Disease (MND). We use a multidisciplinary approach to discover and validate novel targets that are amenable to therapeutic intervention. Our group is also interested in identifying novel diagnostic markers for the early detection of these conditions, which is critical to achieve neuroprotection and prevent neuron loss as new treatments are being developed.

We have recently identified multiple new therapeutic targets across the gut-brain axis that require validation in mechanistic and pharmacological studies. These projects, funded by the Michael J Fox Foundation, will utilise relevant preclinical and cellular models of neurodegeneration, as well as ex vivo patient studies to evaluate the effectiveness of our therapeutic targets and diagnostic accuracy of our biomarkers. These studies will provide key mechanistic and therapeutic basis to support clinical translation of these drugs and targets as novel disease-modifying treatments for progressive neurodegeneration. They will also validate the potential of our biomarker approaches for their clinical and diagnostic utility.

Research Projects

- Novel targets and drugs for therapeutic intervention in Parkinson's and Motor Neuron Disease.
- Identifying new biomarkers for early detection of Parkinson's disease.
- Understanding the underlying mechanisms of neurodegeneration in Parkinson's disease
- Understanding and targeting the gut microbiome changes in neurodegenerative disease.

E r.gordon1@uq.edu.au
P 07 3346 6081

researchers.uq.edu.au/researcher/2811

Dr Adam Irwin

Research Field

Paediatric Infectious Diseases

Research Synopsis

Invasive infections in children now most often occur in children with underlying conditions. Increasing rates of antimicrobial resistance make them difficult to treat, as there are few antimicrobial options available for use in children. We perform a range of clinical research aimed at improving the management of these infections, particularly in Gram-negative organisms. We also perform multi-disciplinary research aimed at improving the management of children with sepsis, including rapid detection, implementing standardised treatment pathways and optimising antimicrobial exposures.

We work with partners in microbiology, pathogen genomics, clinical specialities, and industry on a range of laboratory and clinical interventions.

Research Projects

- Understanding the mechanisms of antimicrobial resistance in Gram-negative infections in children
- I mproving the recognition of sepsis in children
- The use of rapid diagnostics to inform treatment of invasive infections in children

E a.irwin@uq.edu.au
P 07 334 66075

researchers.uq.edu.au/researcher/20512

Professor Sunil Lakhani

Research Field

Breast molecular pathology

Research Synopsis

We use molecular pathology to better understand all aspects of cancer, from progression from early lesions, through invasive disease, to metastatic spread.

We also work on the applications of precision oncology.

Research Projects

- Analysis of candidate biomarkers of breast cancer outcomes
- Application of molecular pathology to improve management of familial breast cancers
- Improving therapeutic options for brain metastases

E s.lakhani@uq.edu.au
P 07 3346 6052

researchers.uq.edu.au/researcher/1465

Dr Emanuele Pelosi

Research Field

Developmental biology and reproduction

Research Synopsis

We study the genetics of reproductive conditions using genome editing (i.e. CRISPR) and mouse models. Additional projects include investigating the role of environmental factors in congenital conditions of the reproductive system.

Research Projects

- Analysis of genes involved in anomalies of the reproductive tract
- Epigenetic modifications during sex development
- Novel approaches of gene targeting using CRISPR

E e.pelosi@uq.edu.au
P 7 334 66073

researchers.uq.edu.au/researcher/16232

Dr Amy McCart Reed

Research Field

Breast cancer molecular pathology

Research Synopsis

We work to understand the molecular basis of breast cancer. In particular, we focus on the special subtypes of breast cancer: Invasive Lobular Carcinoma and Metaplastic breast cancer.

We apply histopathology and genomics techniques to understand how these breast cancer types are different, and how we might be able to exploit these differences when it comes to treatments.

We study the precision management of breast cancer using large patient cohorts and applying genome analysis techniques.

Research Projects

- Analysis of candidate biomarkers of lobular breast cancer outcomes
- Understanding heterogeneity of metaplastic breast cancer

E amy.reed@uq.edu.au
P 07 3346 6030

researchers.uq.edu.au/researcher/822

Associate Professor Peter Simpson

Research Field

Cancer genomics

Research Synopsis

We apply genomics technologies and molecular pathology to better understand cancer.

In particular, we focus on three areas: invasive lobular breast cancer; familial (inherited) breast cancer; and lung cancer.

Research Projects

- Analysis of candidate biomarkers of lobular breast cancer outcomes
- Application of sequencing technologies to improve management of familial breast cancers
- Improving genetic testing outcomes in lung cancer

E p.simpson@uq.edu.au
P 07 3346 6051

researchers.uq.edu.au/researcher/1466

Dr Jake Tickner

Research Field

Molecular microbiology and antimicrobial resistance

Research Synopsis

As a part of the 'Microbial diagnostics and antimicrobial resistance characterisation' group at UQCCR, my research focus is the molecular detection of infectious diseases and their associated antimicrobial resistance determinants. Alongside genomic and metagenomic approaches, we aim to identify novel methods of preventing and treating infection.

Research Projects

- Development of molecular detection assays for antimicrobial resistance.
- Potential of probiotic bacteria in preventing the spread of infectious diseases.
- Analysis of the microbiome to identify bacterial diversity and novel disease treatment options.

E j.tickner@uq.edu.au
P 07 3443 7087

researchers.uq.edu.au/researcher/28573

Dr Ella Trembizki

Research Field

Molecular microbiology and antimicrobial resistance

Research Synopsis

My research focuses on novel diagnostic and characterisation tools, antimicrobial resistance surveillance and molecular epidemiology of public health important organisms. As a part of the UQCCR 'Microbial diagnostics and antimicrobial resistance characterisation' group we endeavour to enhance and implement infectious disease diagnosis, surveillance and antimicrobial stewardship practices.

Research Projects

- Novel rapid characterisation of bacterial isolates where we will utilise near infrared spectroscopy and machine learning models
- Development and evaluation of tests for organism viability

E e.trembizki@uq.edu.au
P 07 3646 5050

clinical-research.centre.uq.edu.au/profile/617/ella-trembizki

clinical-research.centre.uq.edu.au/whiley-group

Dr Julie Wixey

Research Field

Fetal growth restriction and neuroprotection in the newborn

Research Synopsis

Our research focusses on mechanisms, detection, and treatment of brain injury in fetally growth restricted babies.

We are investigating how inflammation is associated with brain injury in the growth restricted newborn. We are examining novel detection methods of brain injury and applying different treatments to the clinically relevant growth restriction model, targeting both inflammation and blood brain barrier integrity to protect the vulnerable newborn brain.

Research Projects

- Mechanisms of brain injury in growth restriction
- Novel detection methods of brain injury in the growth restricted newborn using blood biomarkers
- Treatments to protect the growth restricted newborn from adverse brain outcomes

E j.wixey@uq.edu.au
P 07 3346 6027

researchers.uq.edu.au/researcher/5911

Notes

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

CREATE CHANGE

For more information, please contact

T: 07 3346 5555

E: information@uqccr.uq.edu.au

W: clinical-research.centre.uq.edu.au

A: Building 71/918
Royal Brisbane & Women's Hospital Campus
Herston, QLD, 4029

CRICOS Provider 00025B