criticalcare
RESEARCH GROUP

Research Prospectus 2022-23

The Critical Care Research Group at The Prince Charles Hospital would like to acknowledge the Traditional Owners of the land on which our service is located, the Turrbal peoples.

We pay our respects to Elders past, present and emerging.

We acknowledge Aboriginal and Torres Strait Islander peoples across the State for they hold the wisdom and knowledge as the first researchers, scientists and healers.

ccrg.org.au

tpch-ccrg@health.qld.gov.au

CriticalCareResearch

CCRG_Research

WHY WE DO WHAT WE DO

The **Critical Care Research Group (CCRG)** was founded in 2004 based on the needs of the critically ill patient. Our aim then and now remains unchanged - to translate today's research into tomorrow's treatment and ensure that the critically ill patient thrives and doesn't just survive.

20 years on, we continue to grow collaborations with the world's best researchers, creating a silo-free global ecosystem of patients, medicine, engineering, biology and beyond. It is the ethos of "patient first" that has brought some of the brightest minds to us, allowing us to grow into Australia's largest multidisciplinary research group.

It is this team that allows CCRG to be such a successful "hot house" of new talent – all of whom have access to this fertile ecosystem. The publications, PhDs and presentations are all useful measures of our fellow's success, but the camaraderie built during a stint at CCRG continues long after each researcher returns home with new skills, new networks and new ideas, all of which will one day improve a patient's survival.

From Kenya to the UK, Estonia to the UAE, France to Japan, clinical staff, scientists and engineers come to collaborate, innovate and discover. If we have learned anything from the pandemic it is the power of collaborations across time zones and borders can achieve so much more than working on one's own backyard.

If you are keen to be part of the solution, to seize opportunities and think outside your comfort zone whilst becoming a leader in the field of critical illness, all in the safe sunshine of beautiful Queensland, Australia, then we invite you to contact us to discuss what it takes to join the program.

Professor John F Fraser
MB ChB PhD FRCP(Glas) FRCA FFARCSI FCICM FELSO
Founder & Director, Critical Care Research Group

ICETlab

Innovative Cardiovascular Engineering & Technology Laboratory

MISSION
To expedite the development of novel cardiovascular technologies while investigating challenges with existing devices.

WHY
Mortality from cardiovascular disease is expected to rise exponentially over the next 20 years. Cardiovascular devices play an important role in managing these conditions, yet the pathway to clinical implementation for novel devices is convoluted and their subsequent uptake is often slow.

FACILITIES & CAPABILITIES
Computational Fluid Dynamics (CFD), Custom Pump Controllers, Particle Image Velocimetry (PIV), Rotary Moulding, Blood Circulatory Loop, 3D Printing, Left Ventricular Assist Device (LVAD).

STARlab

Scientific & Translational Research Laboratory

MISSION
To understand the most serious health conditions facing critically ill patients.

FOCUS
Extracorporeal Membrane Oxygenation, HTx and lung transplant, Heart Disease and Failure, Acute Respiratory Distress Syndrome (ARDS) and Endothelial Dysfunction.

WHY
After decades of research, mortality rates for many critical illnesses, including sepsis, ARDS, and cardiac shock, are still unacceptably high. Without rapid innovation these challenges are set to plague future generations.

PRIMElab Preclinical Innovative Medical & Engineering Laboratory

MISSION

To develop and test the efficacy and safety of novel medical and surgical interventions.

WHY

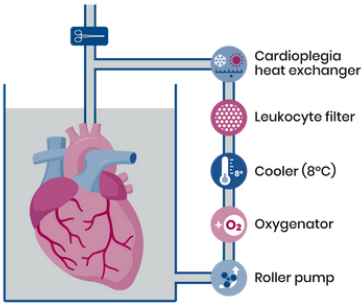
Cardiovascular Disease (CVD) is the leading cause of death globally. An estimated 17.9 million people died from CVD in 2019, representing 32% of all global deaths.

FOCUS

The team works across six main fields of investigation: Severe Cardiac Failure, Heart Transplantation (HTx), Shock States, ARDS, ECMO, and Pulmonary Diseases and Imaging.

DID YOU KNOW?

CCRG's knowledge of Hypothermic Ex Vivo Perfusion (HEVP) was called on during the historic heart xenotransplantation (pig to human) performed in the USA in January 2022.



Hypothermic Ex Vivo Perfusion system

> From its world-class laboratories, multidisciplinary team and extensive global reach, CCRG offers the perfect springboard into a research career.

Dr Silver Heinsar
CCRG PhD Research Program (Estonia)

> (CCRG's) preclinical results encouraged our use of the same system here and gave us confidence to move ahead with a transplant into a human.

Professor Bartley Griffith MD
Lead Pig-to-Human Transplant Surgeon
University of Maryland (USA)

COVID-19 Critical Care Consortium
Incorporating ECMOCARD

A GLOBAL COLLABORATION BORN FROM A GLOBAL CRISIS

Founded by Professor John Fraser, Associate Professor Gianluigi Li Bassi and Dr Jacky Suen, the COVID-19 Critical Care Consortium brings together a global alliance of researchers and clinical personnel from 400+ hospitals and sites in 60 countries.

Through data modelling we generate clinical insights about COVID-19, a disease that was completely unknown before January 2020.

We have revolutionised the way deidentified data is safely and securely shared across the world. This is healthcare without borders, without politics, and without financial gain.

GLOBAL CONNECTIONS

- World Health Organization
- Bill and Melinda Gates Foundation
- University of Oxford
- IBM & Aridhia Informatics
- Asia-Pacific, North America and European Chapters of the Extracorporeal Life Support Organisation

> During the pandemic, CCRG single-handedly assembled a global alliance of health care professionals to support those at the coalface. This will have an impact on the way medical research operates for generations to come.

Dr Leticia Helms MD
PGY1 Internal Medicine
Columbia Medicine Residency (Brazil/USA)

> This is true science to me.
> That's why I get excited....

Dr Mark Ogino MD
International President, ELSO
COVID Critical Steering Committee

COVID-19 CRITICAL CARE CONSORTIUM IN NUMBERS

60+
Countries with COVID Critical research presence

260,000+
Hours of Data Entry

390+
Collaborating centres

19,000
Enrolled participants

11
Manuscripts published with 20+ in various stages of preparation

Connecting ICUs in resource-poor countries with world-leaders in critical care

WELCOME TO QUEENSLAND

Australia's Critical Care Research Group is based at The Prince Charles Hospital, Brisbane, Queensland.

On the doorstep of the Great Barrier Reef and the world-famous Gold and Sunshine Coasts, Brisbane is a thriving multicultural city, with an innovation-led economy and an enviable outdoor lifestyle. A global hub in scientific innovation, mining and resources, technology, education, meetings, incentives, and cultural attractions, Brisbane is a natural home for business, work, and study.

The Prince Charles Hospital (TPCH) is the leading cardiothoracic hospital in Australia with a reputation for delivering excellence in healthcare. We are the centre for leading clinical and translational research programs, particularly in the fields of cardiac thoracic medicine and surgery, and critical care.

To learn more visit studyqueensland.qld.gov.au

"CCRG's offers unique research possibilities found in a combination of engineering, biology lab, preclinical models and patients, all on one campus."

Maximilian Malfertheiner
Former CCRG Research Fellow
Intensive Care & Internal Medicine Specialist
University Hospital Regensburg (Germany)

633,261
YouTube views of World Majlis event from Expo 2020 Dubai

500+
Manuscripts and publications

80+
Team of Scientists, Surgeons, Intensivists, Researchers & Engineers

"Research is all about solving problems through innovation. CCRG provides me with the opportunity to do this, and more, while working alongside a highly skilled and motivated team."

Lucia Gandini
CCRG Research Fellow (Italy)

"CCRG offers me research opportunities I may otherwise never have had access to. The work we do has the potential to make a real difference to the lives of critically ill patients and their families. And for that I am truly grateful."

Dr Nchafatso Obonyo
CCRG Postdoctoral Researcher (Kenya)

TODAY'S RESEARCH TOMORROW'S TREATMENTS

The Critical Care Research Group brings together a diverse team of passionate scientists, engineers and clinical professionals, united by the common goal of improving treatment outcomes for the critically ill.

CCRG has been a springboard to some of the most sought after research positions in Australia and internationally. From world renowned universities to cutting edge science institutes, many CCRG Alumni have gone on to achieve incredible advancements in the field of medical research. We are immensely proud of our many students and senior researchers, and the paths they take following their time with us.

As a CCRG collaborator you will:

- Contribute to life-changing translational research aimed at making a real impact to the lives of critically ill patients
- Have access to a multi-disciplinary team, state-of-the-art facilities, and supportive team and management
- Have a streamlined pathway to a career in academia and research
- Have access to world-leading tertiary education providers including The University of Queensland, Queensland University of Technology, Monash University, Bond University, and Griffith University
- Participate in clinical studies and preclinical trials working closely with world-leading research institutions

> Choose CCRG if you are highly driven and want to learn from some of the brightest minds in preclinical research.

Dr Shaun Gregory
Former CCRG Honours Student
Senior Research Fellow
Mechanical & Aerospace Engineering
Monash University

HONOURS
Students interested in undertaking a research project for their 4th year honours thesis at CCRG have access to a unique multidisciplinary environment and mentorship, gaining real-world experience to prepare them for a career in research.

Students are selected based on their CV, academic record, motivation and work ethic, and can expect to be involved in ground breaking research trials across a range of exciting projects.

PhD and MPhil
PhD students receive unparalleled education in the fields of critical care medicine, cardiology, pulmonary medicine and bioengineering. We welcome students with specific ideas related to our existing research as well as those looking to explore broader research topics. We value candidates who demonstrate dedication and are capable of working autonomously.

POSTDOCTORAL PROGRAM
We look for candidates who are driven and take ownership of their research careers. Postdocs typically lead a multi-disciplinary team on a large project, and are encouraged to take on student supervision, as well as grant applications.

YOUR RESEARCH CAREER STARTS HERE

Join us on our quest to find better treatment options for the critically ill

criticalcare RESEARCH GROUP

Endorsed and supported by

Queensland Government

THE COMMON GOOD

WESLEY MEDICAL RESEARCH

THE UNIVERSITY OF QUEENSLAND AUSTRALIA

World Health Organization

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