

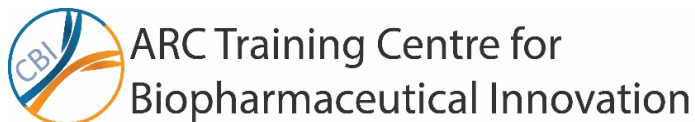


Australian Government  
Australian Research Council

# ARC JOINT SYMPOSIUM – ADVANCED BIOENGINEERED SYSTEMS

19<sup>th</sup> – 20<sup>th</sup> November 2018

The University of Queensland  
GHD Auditorium, Advanced Engineering Building (Building 49)  
Staff House Road  
St Lucia



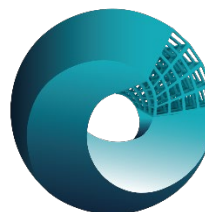
ARC Training Centre for  
Biopharmaceutical Innovation



ARC Centre of Excellence in  
**CONVERGENT  
BIO-NANO SCIENCE  
& TECHNOLOGY**



**Centre for Innovation in  
Biomedical Imaging Technology**  
*An ARC Industrial Transformation Training Centre*



ARC Industrial Transformation Training Centre in  
**ADDITIVE  
BIOMANUFACTURING**

# SYMPOSIUM PROGRAM

## DAY 1 – 19<sup>th</sup> November 2018

9:30am	<b>REGISTRATION AND MORNING TEA</b>
10:00am	<b>SYMPOSIUM OFFICIAL OPENING</b> <i>Dr. Robert Mun, Executive Director, Engineering and Information Sciences, Australian Research Council</i>
10:05am	<u>MTPConnect - the Facilitator of the MedTech and Pharma Sector</u> <i>Dr. Alfredo Martinez-Coll, General Manager, Stakeholder Engagement, MTPConnect</i>
10:10am	<u>Introduction to the ARC Industrial Transformation Training Centre for Innovation in Biomedical Imaging Technology (CIBIT)</u> <i>Professor David Reutens, Centre Director, CIBIT, The University of Queensland</i>
10:20am	<u>Introduction to the ARC Centre of Excellence in Convergent Bio-Nano Science &amp; Technology (CBNS)</u> <i>Associate Professor Kristofer Thurecht, Chief Investigator, CBNS and CIBIT, The University of Queensland</i>
10:30am	<u>Introduction to the ARC Industrial Transformation Training Centre for Biopharmaceutical Innovation (CBI)</u> <i>Professor Stephen Mahler, Centre Director, CBI, The University of Queensland</i>
10:40am	<u>Organisation and Objectives of the ARC Industrial Transformation Training Centre in Additive Biomanufacturing (ABM)</u> <i>Distinguished Professor Dietmar W. Hutmacher, Centre Director, ABM, Queensland University of Technology</i>
10:50am	<u>Biologics Manufacturing: Simplifying Your Outsourcing Strategy</u> <i>Dr. Kym Baker, General Manager, Pharma Services, Patheon Biologics Australia</i>
11:30am	<u>Applications of Multiscale Electron Microscopy in Cells and Tissues</u> <i>Professor Robert Parton, Chief Investigator, CBNS, The University of Queensland</i>
12:10pm	<b>LUNCH</b>
1:10pm	<u>Multuximab® – a Novel Anti-GPC-1 Antibody for Cancer Imaging and Therapy</u> <i>Dr. Brad Walsh, Partner Investigator, CIBIT, Minomic International Ltd</i>
1:50pm	<u>Reagentless Optical Biosensors for Rapid Protein Detection in Biological Environments</u> <i>Dr. Simon Corrie, Chief Investigator, CBNS, Monash University</i>
2:30pm	<b>AFTERNOON TEA</b>
3:00pm	<u>Putting the Clamp on Subunit Viral Vaccines</u> <i>Professor Paul Young, Head of School of Chemistry &amp; Molecular Biosciences, The University of Queensland</i>
3:40pm	<u>From Nature to Advanced Soft Engineering Materials: Soft Network Composites</u> <i>Dr. Onur Bas, Postdoctoral Research Fellow, ABM, Queensland University of Technology</i>
4:20pm	<b>DAY 1 WRAP UP DISCUSSION AND CLOSE</b>
4:40pm	<b>NETWORKING DRINKS</b>

# SYMPOSIUM PROGRAM

## DAY 2 – 20<sup>th</sup> November 2018

10:00am	<b>DAY 2 OPEN</b>
10:05am	<u>Printing of New Materials for Hard Tissue Applications</u> <i>Dr. Kate Fox, Senior Lecturer Biomedical Engineering, School of Engineering, RMIT University</i>
10:45am	<b>MORNING TEA</b>
11:15am	<u>Pointing in the Right Direction: Controlling the Orientation of Proteins on Nanoparticles to Improve Drug Delivery</u> <i>Dr. Angus Johnston, Chief Investigator, CBNS, Monash University</i>
11:55am	<u>Biologics: Discovery through to Manufacturing</u> <i>Dr. Martina Jones, Deputy Director, CBI, The University of Queensland</i>
12:35pm	<b>LUNCH</b>
1:35pm	<u>Gelatin-based Bioinks</u> <i>Associate Professor Travis Klein, Deputy Director, ABM, Queensland University of Technology</i>
2:15pm	<u>Dendrimer for Drug Delivery</u> <i>Dr. David Owen, Vice President, Research, Starpharma Holdings Ltd</i>
2:55pm	<b>AFTERNOON TEA</b>
3:25pm	<u><sup>19</sup>F Magnetic Resonance Imaging for Targeted Detection of Breast Cancer with High Sensitivity</u> <i>Dr. Cheng Zhang, Postdoctoral Research Fellow, CBNS, The University of Queensland</i>
4:05pm	<b>SYMPOSIUM WRAP UP DISCUSSION AND CLOSE</b>

## SPEAKER BIOS



### **Dr. Robert Mun, Executive Director, Engineering and Information Sciences, Australian Research Council**

Dr. Robert Mun joined the ARC in May 2018. He has a strong technical background as a researcher, and has had an extensive career in the Australian Government. Prior to joining the ARC, Dr. Mun was Branch Head at the Defence Science and Technology Group with the Australian Department of Defence, and previously was Scientific Advisor to Navy and to the Defence Material Organisation, and Senior Scientist leading systems engineering research, also with the Department of Defence. With research expertise commencing in the area of fluid mechanics, through his subsequent Australian Government roles, his experience has extended to complex systems integration, focusing on the integration and networking of multiple Defence systems. His research team's specialty was including the human element within the engineering solution. Dr. Mun has authored numerous Australian Government reports, and has contributed to a wide range of policy and capability outcomes.



### **Dr. Alfredo Martinez-Coll, General Manager, Stakeholder Engagement, MTPConnect**

Dr. Alfredo Martinez-Coll is a Graduate of the Australian Institute of Company Directors, a Registered Technology Transfer Professional and a member of the NSW AusMedTech (Medical Devices) Committee of AusBiotech. With a B.S. in Biomedical Engineering from Louisiana Tech University (USA), a PhD and post-doctoral training in biomedical sciences from University of Technology, Sydney, Dr. Martinez-Coll brings more than 16 years research experience in the areas of artificial organs, cardiovascular and cerebrovascular physiology, membrane transport, and oxygen transport to tissue. He has worked as a business development manager in Technology Transfer/commercialisation for the past 13 years at public hospitals and in academia. His main areas of interest are sustainable funding for science, entrepreneurship and innovation, project management in science and business development. He is passionate about engaging with researchers and Industry specialists in the Life Sciences arena to translate research discoveries into social impact. He has most recently held the position of Senior Business Development Manager at UNSW Innovations.



### **Professor David Reutens, Centre Director, ARC Training Centre for Innovation in Biomedical Imaging Technology, The University of Queensland**

Prof. David Reutens commenced his role as the Director of the ARC Training Centre for Innovation in Biomedical Imaging Technology (CIBIT) in 2017 and was appointed as the inaugural Director of the Centre for Advanced Imaging (CAI) at The University of Queensland in 2008. Prior to that, Prof. Reutens was the Professor of Neuroscience at Monash University and Director of Neurology at Southern Health. He is also a clinical neurologist specialising in epilepsy and is a senior staff specialist at the Royal Brisbane and Women's Hospital. His main interests lie in neuroimaging, cognition, epilepsy, stroke and genotype-phenotype relationships. It was the interest in the latter which led to his founding of the Australian Mouse Brain Mapping Consortium. He supervises the overall coordination of the project and specifically, the development of new tools for computational anatomy and the image processing of the immunohistochemical and MR data. He is the Foundation Chair of Experimental Neurology.



### **Associate Professor Kristofer Thurecht, Chief Investigator, ARC Centre of Excellence in Convergent Bio-Nano Science & Technology and ARC Training Centre for Innovation in Biomedical Imaging Technology, The University of Queensland**

A/Prof. Kris Thurecht is a NHMRC Career Development Fellow (step 2) with appointments at the Australian Institute for Bioengineering and Nanotechnology (AIBN) and the Centre for Advanced Imaging (CAI) at The University of Queensland. A/Prof. Thurecht is also a Chief Investigator in the ARC Centre of Excellence in Convergent Bio-Nano Science & Technology (CBNS) and Theme Leader in the ARC Training Centre for Innovation in Biomedical Imaging Technology (CIBIT). His research focuses on the development of polymer and nanoparticle-based devices for nanomedicine. This involves developing a strong understanding of the fundamental properties of the nanomaterial-delivery system, in addition to identifying and successfully delivering new

therapies. Central to the development of these future therapeutic platforms is the field of theranostics, where molecular imaging plays a key role in understanding the dynamics of polymeric nanomedicines. The Thurecht research team works across the boundaries of chemistry and materials, biology and imaging science to probe how nanomaterial properties affect their function in living animals.



**Professor Stephen Mahler, Centre Director, ARC Training Centre for Biopharmaceutical Innovation, The University of Queensland**

Prof. Stephen Mahler commenced his role as the Director of the ARC Training Centre for Biopharmaceutical Innovation (CBI) in 2016. Prof. Mahler is a Senior Group Leader at the Australian Institute for Bioengineering and Nanotechnology (AIBN) at The University of Queensland. He is a biotechnologist with a focus on R&D of recombinant-DNA derived protein biopharmaceuticals and drug delivery systems. He has a record of translational research success and engages extensively with industry associated with the biomedical sciences both nationally and internationally.



**Distinguished Professor Dietmar W. Hutmacher, Centre Director, ARC Training Centre in Additive Biomanufacturing, Queensland University of Technology**

Distinguished Prof. Dietmar W. Hutmacher is a biomedical engineer, an educator, an inventor and a creator of new intellectual property opportunities. He directs the Centre in Regenerative Medicine and the ARC Training Centre in Additive Biomanufacturing (ABM) at Queensland University of Technology, a multidisciplinary team of researchers including engineers, cell biologists, polymer chemists, clinicians and veterinary surgeons. DProf. Hutmacher is an internationally recognized leader in the fundamental science of biomaterials, tissue engineering and regenerative medicine and also has an outstanding track record in translating applied research into intellectual property and commercialization portfolios. DProf. Hutmacher serves on the ARC College of Experts and was awarded a prestigious ARC Future Fellowship in 2010, the professorial Hans Fischer Senior Fellowship at the Technical University Munich in 2014 and Humboldt Research Award in 2017. He has supported a bone tissue engineering concept from the laboratory through to clinical application involving *in vitro* experiments, preclinical studies and ultimately clinical trials. His recent research efforts have resulted in traditional scientific/academic outputs as well as pivotal commercialisation outcomes.



**Dr. Kym Baker, General Manager, Pharma Services, Patheon Biologics Australia**

Dr. Kym Baker is General Manager of Patheon Biologics Australia. Patheon is a contract manufacturer of biological parental products produced from mammalian cell lines for both ongoing clinical trials and commercial drug manufacture serving a worldwide market. Dr. Baker has a strong academic and commercial background, holding a variety of positions in the biotechnology and biopharmaceutical industry for over 20 years in the UK. Following industrial sponsored post-doctoral studies at the University College of London and University of Kent working with Celltech (now UCB), GSK, British Biotech and Lonza, Dr. Baker joined the management team in Lonza, UK holding a variety of senior positions across both development, manufacturing and quality. Returning to Australia, she took up the GM role in Patheon. Dr. Baker graduated with 1<sup>st</sup> class Honours from the first ever intake of The University of Queensland's Bachelor of Applied Science Biotechnology programme then obtained her PhD from the Australian National University in Canberra based in CSIRO. Dr. Baker is passionate about science education and the development of future scientific and engineering talent to help grow the biotechnology industry in Australia through improved collaboration between industry and academia.



**Professor Robert Parton, Chief Investigator, ARC Centre of Excellence in Convergent Bio-Nano Science & Technology, The University of Queensland**

Prof. Robert Parton is a NHMRC Senior Principal Research Fellow, a Deputy Director in the Centre for Microscopy and Microanalysis (CMM), a Group Leader in Molecular Cell Biology at the Institute for Molecular Bioscience (IMB) at The University of Queensland and a Chief Investigator in the ARC Centre of Excellence in Convergent Bio-Nano Science & Technology (CBNS). His research focuses on the cell



surface and, in particular, on the structure and function of caveolae, small pits in the plasma membrane which have been linked to tumour formation and muscular dystrophy.



**Dr. Brad Walsh, Partner Investigator, ARC Training Centre for Innovation in Biomedical Imaging Technology, Minomic International Ltd**

Dr. Brad Walsh is Chief Executive Officer and a Director of Minomic International Ltd, a Sydney-based biotechnology company specialising in immuno-oncology and an industry partner in the ARC Training Centre for Innovation in Biomedical Imaging Technology (CIBIT). He founded Minomic to bring to market an innovative biomarker for prostate cancer. Dr. Walsh has led Minomic's scientific and business development, raising \$26 million and bringing the company to a point at which its first major product, MiCheck®, has progressed through a series of clinical trials in preparation for release to the US market in early 2019. Dr. Walsh has developed a pipeline of potential new therapeutics for prostate, bladder and pancreatic cancer and this has prompted the spin out of a new company, GlyTherix Ltd. Dr. Walsh's career in biotechnology began with a PhD in protein chemistry. Over the following years he led research groups in government agencies, universities and hospitals and was a key part of the establishment of a major national research facility, APAF, before forming Minomic in 2007. He continues to be active in research collaborations and academic supervision and was a joint recipient of one of Australia's most prestigious science awards, a Eureka Prize, for Interdisciplinary Research in 2015. More recently, Dr. Walsh won first prize against a field of international competitors at the 2018 Innovation & Entrepreneurship Competition for Overseas High-Level Talents in Hangzhou, China. He has co-authored 90 peer reviewed papers and book chapters and six patents. He is also a mentor for the IMNIS Program and an active member of the NSW AusBiotech committee for the last four years.



**Dr. Simon Corrie, Chief Investigator, ARC Centre of Excellence in Convergent Bio-Nano Science & Technology, Monash University**

Dr. Simon Corrie is a Senior Lecturer in the Department of Chemical Engineering at Monash University, and a Chief Investigator in the ARC Centre of Excellence in Convergent Bio-Nano Science & Technology (CBNS). Dr. Corrie also holds Honorary Research Fellow appointments at the Australian Institute for Bioengineering and Nanotechnology (AIBN) and the Centre for Advanced Imaging (CAI) at The University of Queensland. With a background in physical chemistry, he has developed several molecular technologies with applications in diagnostics. His current research is focused on developing biosensors for continuous and/or real-time detection of proteins and metabolites in biological environments and he leads the Nanosensor Engineering Lab at Monash University.



**Professor Paul Young, Head of School of Chemistry & Molecular Biosciences, The University of Queensland**

Prof. Paul Young holds the position of Professor of Virology besides heading the School of Chemistry and Molecular Biosciences at The University of Queensland. Prof. Young is the current President of the Australian Society for Microbiology and the President of the Asia Pacific Society for Medical Virology. His research into viral replication employs molecular and structural biology and protein chemistry. His expertise includes the immunopathology of medically important viral infections including Ebola. Understanding the process of viral replication is essential for the development of improved diagnostics, vaccines and anti-viral therapeutic control strategies. His group's research interests encompass the molecular biology and immunopathology of medically important viral infections including Ebola. Current studies are focused on two different viruses: dengue virus, a serious mosquito-borne disease in many tropical countries, and Respiratory Syncytial Virus (RSV), a major cause of hospitalization of children with respiratory infections. The primary goals of his research are the development of vaccine and anti-viral strategies for the control of infections as well as a clearer understanding of the pathogenesis of severe disease.



**Dr. Onur Bas, Postdoctoral Research Fellow, ARC Training Centre in Additive Biomanufacturing, Queensland University of Technology**

Dr. Onur Bas is a Postdoctoral Research Fellow within the ARC Training Centre in Additive Biomanufacturing (ABM) and a member of the Centre in Regenerative Medicine led by DProf. Dietmar Huttmacher at Queensland University of Technology. Dr. Bas received his Bachelors in Mechanical Engineer (Eastern Mediterranean University, 2011) and holds a Master of Science degree in Manufacturing Systems Engineering (University of Warwick, 2012). He completed his doctorate in Biomedical Engineering (QUT, 2018) with his thesis entitled "Deterministic design & additive biomanufacturing of biomimetic soft network composites for tissue engineering applications". His research interests include biofabrication, additive manufacturing, and the design and development of advanced composite materials for tissue engineering applications. He is also involved in the development of new technologies, in particular, melt electrowriting, a novel additive manufacturing system that enables the fabrication of complex 3D structures consisting of highly organized microfibers which have a broad range of applications.



**Dr. Kate Fox, Senior Lecturer Biomedical Engineering, School of Engineering, RMIT University**

Dr. Kate Fox is a Senior Lecturer in the School of Engineering at RMIT University. A biomedical engineer, Dr. Fox has been involved in two of the biggest medical bionics projects in Australia: the Bionic Eye and the Stentrode device, a device capable of directly interfacing with the brain. She is interested in new materials for medicine. At present she is working in additive manufacturing using diamond for orthopaedic implant applications. Prior to joining academia she worked as a patent attorney. Dr. Fox is an active promoter of community engagement with engineering.



**Dr. Angus Johnston, Chief Investigator, ARC Centre of Excellence in Convergent Bio-Nano Science & Technology, Monash University**

Dr. Angus Johnston is an NHMRC Research Fellow and head of the Nanomaterials for Biology group at the Monash Institute of Pharmaceutical Sciences. His current research focuses on developing drug delivery systems and engineering molecular sensors for tracking proteins, nucleic acids and nanoparticles in cells. He received his PhD in 2006 from The University of Queensland and worked at the University of Melbourne as a research fellow and Australian Postdoctoral Fellow until 2013. Dr. Johnston has received a number of awards for his research, including the 2017 Grimwade Prize for Industrial Chemistry, Young Tall Poppy Award and he was a finalist for the Eureka Award for Outstanding Young Researcher.



**Dr. Martina Jones, Deputy Director, ARC Training Centre for Biopharmaceutical Innovation, The University of Queensland**

Dr. Martina Jones is the Deputy Director of the ARC Training Centre for Biopharmaceutical Innovation (CBI). Dr. Jones's research interests lie in the discovery and engineering of monoclonal antibodies for research and therapeutic use. She completed a PhD at The University of Queensland studying the application of engineered antibodies as reagents in diagnostic ELISAs. She then took up the role of research officer in the National Biologics Facility (NBF) at the Australian Institute for Bioengineering and Nanotechnology (AIBN), and now is Operations Manager for the Facility. She established phage display technology as a capability at NBF, and assists researchers around Australia in using the Facility's capabilities for antibody discovery, protein manufacturing and process development.



**Associate Professor Travis Klein, Deputy Director, ARC Training Centre in Additive Biomanufacturing, Queensland University of Technology**

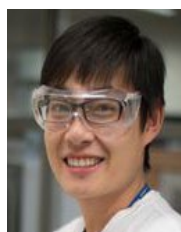
A/Prof. Travis Klein is the Deputy Director of the ARC Training Centre in Additive Biomanufacturing (ABM). A/Prof. Klein heads the Cartilage Regeneration Laboratory (CRL) at the Institute of Health and Biomedical Innovation (IHBI) at Queensland University of Technology. He is leader in the Injury Prevention and Trauma Management Theme at IHBI and in the Biomedical Engineering and Medical

Physics Discipline, at the School of Chemistry, Physics and Mechanical Engineering at Queensland University of Technology. His ultimate aim is to help develop long-term regenerative therapies for damaged joints. To help understand chondrogenesis and joint pathologies, and engineer functional tissues, his group is developing functionalised biomaterials, biofabrication approaches, and mechanical stimulation technologies that can provide realistic environments for embedded cells. One particular area of interest has been in understanding the differences between chondrocytes and extracellular matrix of different depth zones, and recapitulating these *in vitro*.



**Dr. David Owen, Vice President, Research, Starpharma Holdings Ltd**

Dr. David Owen has extensive experience in medicinal chemistry and biochemistry, and in managing teams focused on commercially directed drug discovery. Dr. Owen has held several positions in the biotech industry including Mimotopes, Cerylid and Glykoz and gathered extensive international experience in biotechnology and pharmaceutical research and development. Since joining Starpharma Dr. Owen has driven the drug delivery programs by developing and executing a number of successful proof-of-concept studies. The results from these studies have led to a number of commercial partnerships such as Stiefel a GSK company, Lilly and AZ, as well as driving Starpharma's own internal drug delivery program focused on an improved dendrimer-docetaxel formulation.



**Dr. Cheng Zhang, Postdoctoral Research Fellow, ARC Centre of Excellence in Convergent Bio-Nano Science & Technology, The University of Queensland**

Dr. Cheng Zhang works in the research group of Chief Investigator and UQ Node Leader, Prof. Andrew Whittaker. Dr. Zhang's research area is polymer physical chemistry, polymeric biomaterials and nanosensors. In 2018, he was awarded a NHMRC Early Career Research Fellowship. His research aims to develop an effective synthetic method with excellent reproducibility to produce translatable and precisely defined polymeric nanomedicines and to investigate the factors affecting their therapeutic efficacy.