UNIVERSITY OF WOLLONGONG AUSTRALIA

TRICEP

ANFF MATERIALS



2022

ANNUAL REPORT

INTELLIGENT POLYMER RESEARCH INSTITUTE

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Welcome

The Intelligent Polymer Research Institute (IPRI) began in 1994 and is recognised as a leader in electromaterials research, covering disciplines of electrochemistry, biomaterials, stem cell biology, materials synthesis, characterisation and fabrication. IPRI also serves as the headquarters for the Australian National Fabrication Facility (ANFF) Materials Node and has recently established the Translational Research Initiative for Cellular Engineering and Printing (TRICEP). IPRI continues it excellence in research with over 1600 publications produced (and counting, with 115 published in 2022) and total citations more than 83000. IPRI staff and students were recognised by multiple awards (see Awards and Recognition) and currently have more than 30 active grants. IPRI remains dedicated to engagement with presentations at over 35 conferences and workshops during 2022 and more than 40 stakeholder engagements.

2022 saw the final report for ARC Centre of Excellence for Electromaterials Science (ACES) delivered to the ARC in June completing the extensive journey that began in 2004 as an ARC Centre, subsequently upgraded in 2005 to an ARC Centre of Excellence and successful extension in 2014. The legacy of ACES will impact the international research landscape for years to come.

IPRI is renowned for research of high impact in energy and health. Thus, we propose to build on our track record of significant contributions to the United Nations Sustainable Development Goals (SDGs), through the integration of skills that enable fundamental advances in materials science to be translated into applications.

IPRI is positioned to meet community, local, national and international needs in electromaterials research and development.





Word from the Director

2022 – what an extraordinary year!

Through somewhat tumultuous times we have worked together to create an exciting vision for the future of IPRI. With the wind up of a highly successful ARC Centre of Excellence we have positioned ourselves to build on a wealth of fundamental knowledge and to create a translational pipeline that is delivering exciting outcomes (see Translation and Engagement).

As our projects proceed down the translational pipeline, we find ourselves engaged with consumer groups, policy makers, regulating of course the commercial world in order to take ideas to industries.

I would like to emphasise the importance of our community engagement. Our annual Bill Wheeler Symposium acts as a focal point bringing together clinicians, scientists and the community to explore the most recent advances in medical technology and to celebrate the achievements of our early career researchers.

On the matter of early career researchers, we helped launch a Beyond Science Program in 2022. This initiative brings together younger clinicians and researchers to work together on translatable challenges and plugs them into an appropriate network to facilitate the journey.

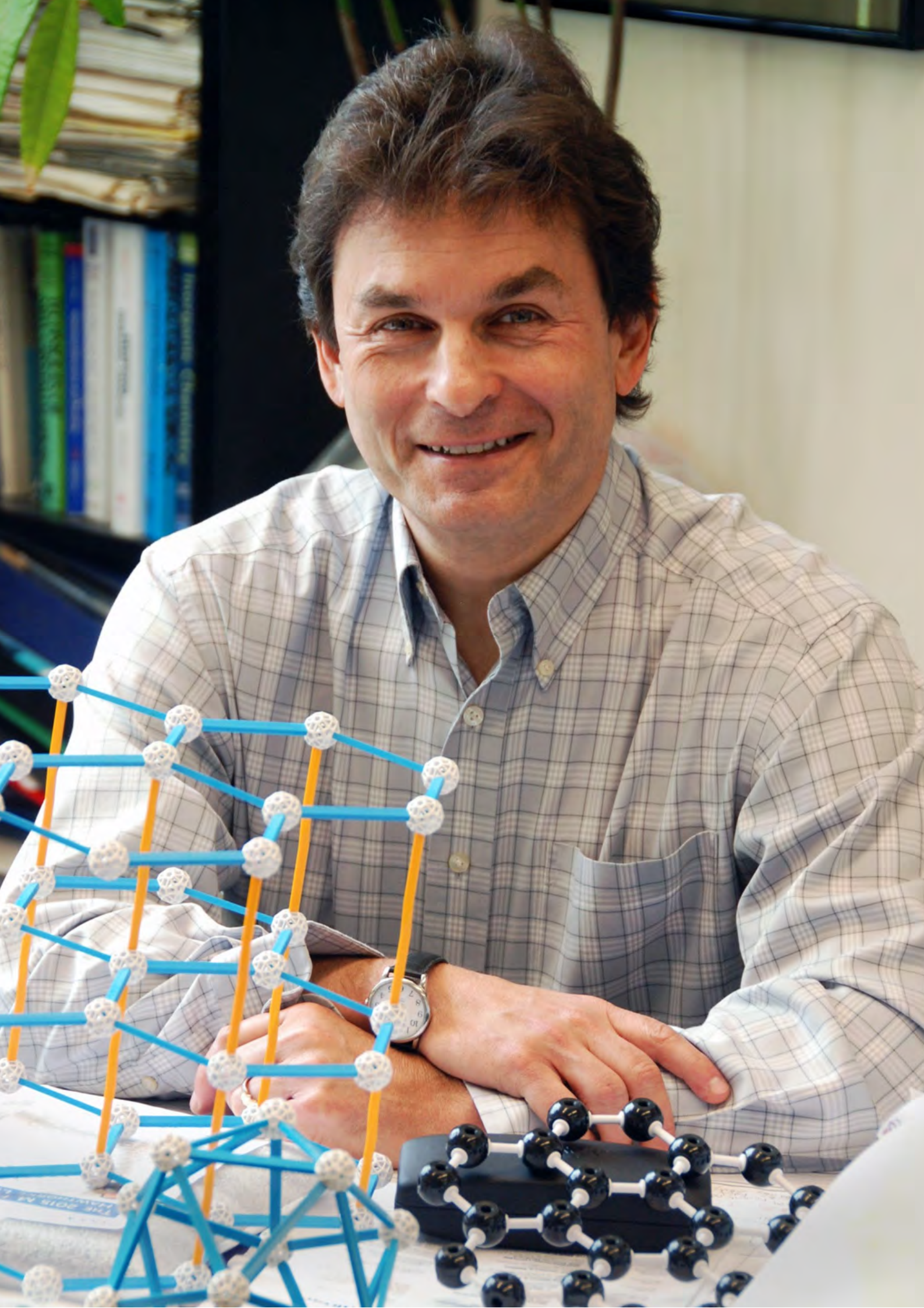
We have exciting prospects ahead for 2023. This includes further initiations in

- Deployable technologies for medicine in space
- New materials and fabrication methods for electroceuticals

A huge thank you to all of our colleagues and collaborators.

Thank you for your support and inspiration!

Bring on 2023!

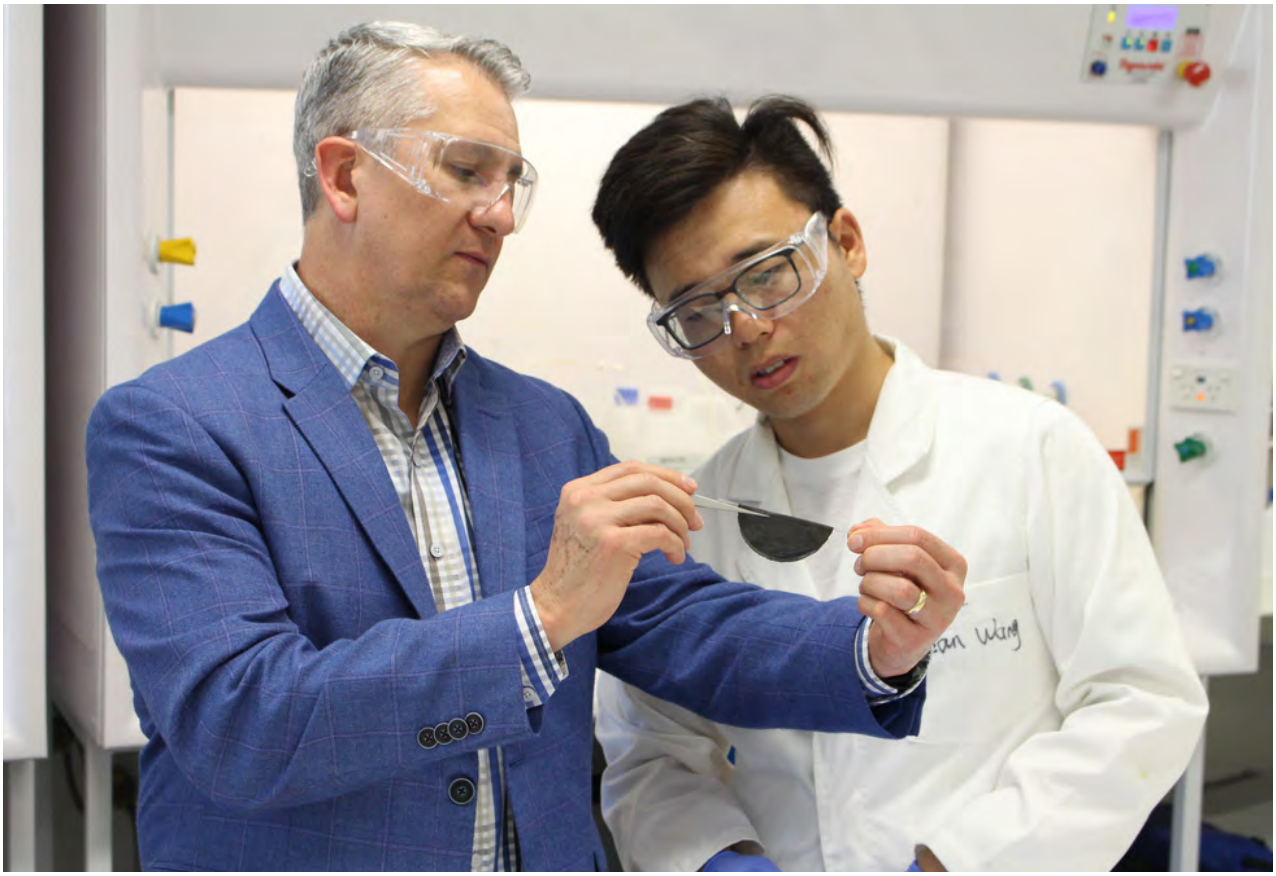


International Advisory Committee Chair Report

IPRI is recognised internationally for electromaterials science and its ability to perform not only fundamental research at the forefront but engage with end-users to ultimately enable the successful translation for real world impact. IPRI has been inspirational globally, and due to its success, the model has been adopted in many other institutions around the world.

2022 saw the revitalisation of the International Advisory Committee with 7 members including Director and Chief Operating Officer. Members were nominated to serve for a period of two years. The committee will provide ongoing advice into the Institute's research programs and positioning of the Institute's activities to secure and retain a position of global leadership in science undertaken.

IPRI is well positioned to engaged in the merging opportunities including electroceutical, corneal bioengineering, biomanufacturing and deployable technologies for challenging, remote locations including fabrication and biomaterials for medicine in space.



Highlights

LKM Address

Leon Kane-Maguire was one of Australia's leading scientists in nanomaterials, based at the University of Wollongong. The annual Leon Kane-Maguire Address commemorates and celebrates Leon's contribution to research, his wicked sense of humour, the communication of science, and the mentoring of the next generation of researchers. This year's event, held on May 4, featured a special guest presentation by Prof Robert Forster from Dublin City University. As part of the evening, the Leon Kane-Maguire student prize (donated by the Kane-Maguire family) was awarded to Bailey Skewes and Rebecca Farrell, the equal highest achieving UOW School of Chemistry Honours degree students weighted over all the years of their degree.



Beyond Science

The Beyond Science Platform, co-founded by Gordon Wallace and surgeon Payal Mukherjee, was launched in February 2022 in conjunction with Royal Australasian College of Surgeons New South Wales (RACS NSW) Surgeons' month. Beyond Science Platform is a training program aiming to incrementally develop a comprehensive, Australian-first, medical technology translation program for Otolaryngology, Head and Neck Surgery. Despite a rich history of biomedical innovation in Australia, there were no formal surgeon-scientist training pathways in Otolaryngology, Head and Neck Surgery in NSW. Beyond Science is addressing this need.

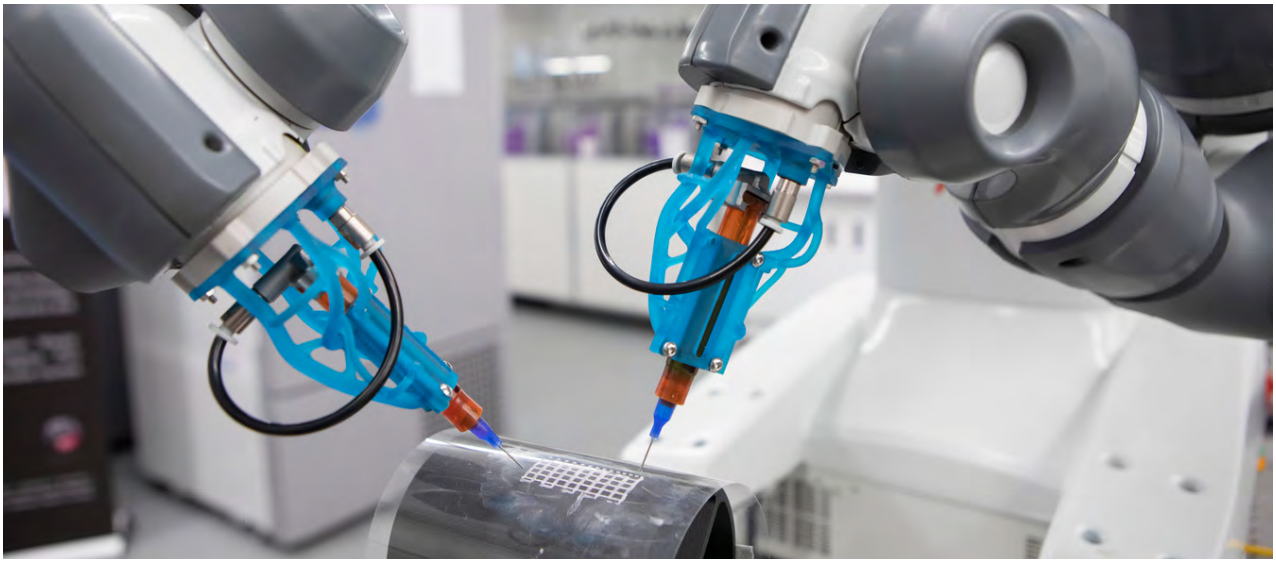
National Science Week and Bill Wheeler Award and Symposium

Researchers at IPRI celebrated National Science Week in August, with a number of events held at the Institute including the Bill Wheeler Symposium and Open Day.

The annual Bill Wheeler Award and Symposium, dating back to 2009, honours the late Bill Wheeler, who took a keen interest in new bionics research at the University of Wollongong (UOW), and was an instigator in organising a fundraiser for bionics research. Bill's passion for science continues to live on with the award, given to the student who best communicates the social impact of their research and how the prize will benefit their work. This year's award, supported by the Kiama Rotary Club and a generous donation from Lotus Accountants, was received by IPRI and UOW PhD candidate Mitchell St Clair-Glover, who is working with stem cells using 3D bioprinting to model organotypic skin tissues. The event also featured a keynote talk by special guest and reconstructive surgeon at the Chris O'Brien Lifehouse, Prof Jonathan Clark, inspiring the audience and speaking on his work and the importance of the many aspects that underpin it.

Graduate Honour Roll 2022

- Mohammed Almossawi (PhD)
- Joshua Brooks (PhD)
- Inseong Cho (PhD)
- Luciana Yumiko Daikuara (PhD)
- Md Habibullah Dalal (PhD)
- Yuchao Fan (PhD)
- Narangerel Gantumur (Masters)
- Anne-Katrin Gruska (Masters)
- Hannah Haag (Masters)
- Abdul Moqeet Hai (PhD)
- Chunyan Qin (PhD)
- Grishmi Rajbhandari (PhD)
- David Shephard (PhD)
- Alireza Talaei (PhD)
- Ane Urigoitia Asua (Masters)
- Amruthalakshmi Vijayakumar (PhD)
- Shuai Zhang (PhD)
- Ying Zhou (PhD)
- Jinshuo Zou (PhD)



Research

- ARC Centre of Excellence for Electromaterials Science (ACES) and University of Wollongong (UOW) researchers at the Intelligent Polymer Research Institute (IPRI) have unearthed an innovative approach to electrical stimulants of cells using a wireless system. The recent findings aim to advance the understanding of the interplay between bipolar electrochemistry (BPE), conductive polymers (CPs) and wireless electrical stimulation of biological systems (WES), whilst being aligned with the Australian Government's Science and Research Priority, "Health". The paper, titled 'Enhanced wireless cell stimulation using soft and improved bipolar electroactive conducting polymer templates', Applied Materials Today highlights how novel bipolar electroactive CPs provide a unique conduit for electrical communication with living cells, enabling wireless delivery of both electrical and molecular (bio)chemical stimuli within one system. By using BPES with CPs they have shown positive influences on cell behaviour including neural cell to proliferation and differentiation.

- Researchers at the Intelligent Polymer Research Institute (IPRI) have reviewed Cu complexes as molecular catalysts in both homogeneous and heterogeneous systems for electrochemical CO2 reduction. A publication titled 'Electrochemical CO2 Reduction Catalyzed by Copper Molecular Complexes: The Influence of Ligand Structure', published in Energy & Fuels. The purpose of this work is to accelerate the development of CO2 reduction catalysts by finding molecular structural guidelines for Cu complexes. Future implications for the research will focus on the design of complexes that will be guided by combinatorial studies coupled with machine learning algorithms to find strong correlations in the multidimensional space of molecular structure-CO2 reduction conditions-product selectivity and efficiency of electrochemical CO2 reduction.

- Researchers at IPRI continue to tackle the challenges that must be confronted if advances in tissue engineering and biofabrication are to be deployed in a clinical setting. The recent paper, 'Standardised quantitative ultrasound imaging (SQUI) approach for the non-destructive three-dimensional imaging and quantification of cartilage formation in hydrogel based bioscaffolds, published in Acta Biomaterialia, highlights some of the progress being made at IPRI. The paper details on an innovative approach that employs ultrasound for the non-destructive quantification and visualisation of cartilage formation in tissue engineered bioscaffolds. This work represents a significant achievement in the area of imaging technologies for tissue engineering and regenerative medicine, an approach that enables the quantitative characterisation of the constructs without damage.



- A new article explores the current landscape of laser-based 3D printing in the context of bone tissue engineering. Titled ‘Laser Sintering Approaches for Bone Tissue Engineering’, the review outlines how we can use 3D printing, in the form of powder bed fusion, to replace or stimulate the growth of human bone tissue. The work provides a materials insight into the technical and regulatory hurdles research bone tissue engineering research must overcome to successfully print human bone.

- Applying 3D Bioprinting for Personalised Glioblastoma Care- Professor Jeremy Crook and Dr Eva Tomaskovic-Crook have been awarded a prestigious cancer research grant of $96,600 for a project titled “3D bioprinting with glioblastoma ‘ink’: engineering patient-specific brain tumours for high throughput drug screening and individualised therapy”. The project involves collaborating with researchers at Chris O`Brien Lifehouse comprehensive cancer centre, Royal Prince Alfred Hospital, and The University of Sydney. Briefly, glioblastoma (GB) is the most common and aggressive brain cancer in adults and remains incurable. The average survival rate for GB patients is 14 months, and this has not changed for more than 30 years. Patients need scientists and clinicians to work together; to rethink, innovate and deliver a better treatment model. With access to cutting-edge research infrastructure at both IPRI and the Arto Hardy Family Biomedical Innovation Hub at Chris O’Brien Lifehouse, Jeremy and Eva are applying a model for collaborative multidisciplinary practice–research, with the aim of innovating a transition to personalised glioblastoma care. The project involves IPRI PhD students Ms Sarah Higginbottom and Ms Emma James who are investigating GB modelling and cardiac toxicity induced chemotherapy modelling, respectively. As such, the research is enabling testing novel treatments without toxicity or negative side effects to patients. Significantly, it is expected to result in a new approach to indicating whether a specific drug is likely to be effective for treating an individual patient’s glioblastoma tumour. Selecting drugs that are proven to be effective against a patient’s tumour in the laboratory will very likely lead to a much better treatment response, improved quality of life and longer survival. More details can be found here.

ANFF Highlights

IPRI is home to the ANFF Materials Node Headquarters.

The materials node continues to provide the facilities and skills needed to scale up synthesis of the most advanced/recently discovered materials and fabrication approaches that enable the integration of these into structures and devices for energy and health.

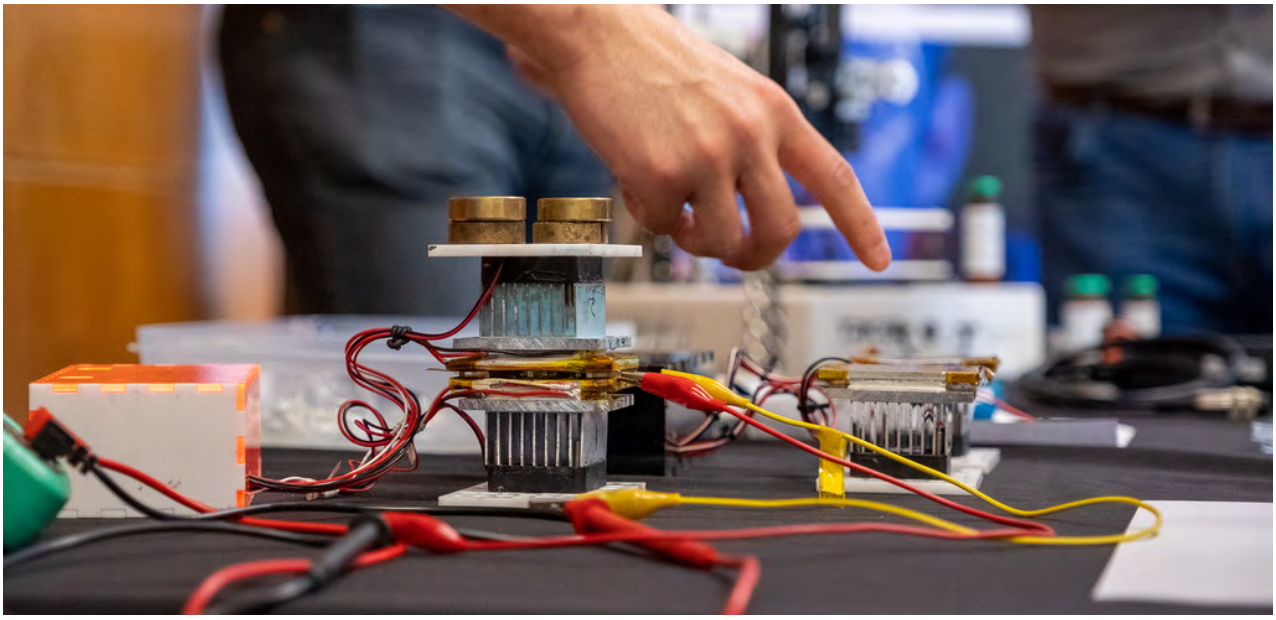
New Materials

- Scaled up processing of a newly discovered graphene, edge functionalised graphene (EFG) up to 1 kg per week – scaling towards 10 kg per week over next year, in partnership with Sicona Pty Ltd.
- Biomaterials from primary producers. The node is working with the recently established Marine Bioproducts CRC to identify useful biomolecules for tissue regeneration. The node will develop isolation and processing strategies for these important materials.

Energy

Flexible solar cells – the UON team has developed scalable, reel to reel printing technologies to fabricate flexible solar cells. These have been used on a number of demonstrator installations and most recently enabled the Charge Around Australia project.

The EFG materials are finding use in energy storage devices including new battery electrodes being developed by Sicona.





Biomed Tech

The establishment of the UON reel to reel printing facility has also enabled rapid fabrication of low cost glucose biosensors. The team is currently supporting the establishment of the first manufacturing facility for production of the biosensors by a new commercial entity (IBS Inc.). This work is funded by a Modern Manufacturing Initiative (MMI) grant.

The materials node is also assisting significant advances in the field of tissue engineering.

- Skin Regeneration – a project with Inventia Pty Ltd and Prof. Fiona Wood's team at the University of Western Australia. Funded by NSW Medical Devices Fund to achieve a first in human trial in 2023.

- Cartilage – a national consortium involving the ANFF Materials node (via TRICEP), St Vincent's Melbourne and the Royal Prince Alfred has been established to enable cartilage regeneration for knees and ears. The project has attracted funding from the MRFF Stem Cell program to enable a first in human trial in 2025. Our work on 3D printed ears was named as a finalist in the Eureka Prize awards (Interdisciplinary category).

- Bioengineered cornea – a national consortium (ANFF Materials node via TRICEP, NSW Organ Tissue and Donation Service, University of Sydney, University of Melbourne and QUT) has been established to pursue development of a bioengineered cornea. Phase 1 of the MRFF frontiers program has been completed. Decision on Phase 2 funding is pending. If successful we propose to develop a new manufacturing sector for Australia to produce bioengineered structures using the cornea as an exemplar.

- ANFF Commercial – identifying and capitalising on commercial product opportunities arising from work in the med tech space with ANFF(C), including the 3DREDI research and training biofabrication platform and UltraImage, a platform for non-destructive analysis of biofabricated structures.

Awards and Recognition

- Xiao Liu - awarded a CERL Fellowship April 2022.
- Chong-Yong Lee - awarded a UOW CERL Fellowship June 2022.
- Jun Chen was awarded Vice-Chancellor's Research Excellence Award for Researcher of the Year.
- Finalists for Eureka Prize for Excellence in Interdisciplinary Scientific Research. Titled NEW EARS, the team involved in the selected finalist project includes UOW's IPRI Director Prof Gordon Wallace and IPRI Research Fellow Dr Johnson Chung. The project is a collaboration with the RPA Institute of Academic Surgery and Chris O' Brien Lifehouse. ENT Surgeon A/Prof Payal Mukherjee, scientist Dr Kai Cheng and prosthetists Sophie Fleming are other critical members of the team. With their mix of expertise and experience, the NEW EARS team looks to develop a single-step solution to combat the usually complex approach to ear reconstruction. The project combines innovative materials and prosthetics with new 3D bioprinting technology, creating the potential for low-cost reconstructive treatments deployable around the world.
- Clarivate 2022 Highly Cited Researchers – Senior Professor Jun Chen – Cross Field
- The Australian National Fabrication Facility's (ANFF) Dr Johnson Chung from the Materials Node were awarded a 2022 Frater Award, presented at last month's ANFF Gala Dinner held at the National Gallery of Australia in Canberra. The annual awards are presented to ANFF staff members to enable career development by fostering technical and professional growth through national or international activities. Dr Chung, based at the University of Wollongong's (UOW) Materials Node, was amongst nine other award winners from the ANFF network across the country to receive an award.
- Carly Baker made it to 3MT final
- Due to COVID and Daniel Lawrence from the Materials Node was awarded a 2021 Frater Award at the start of 2022.
- Eileen Wallace Won 1st place in the AIIM 3MT faculty heat and went to UOW final

- Emma James received a National Stem Cell Foundation (NSCFA) and Australasian Society for Stem Cell Research (ASSCR) Post Graduate Conference Travel Award

- Johnson Chung was awarded “Top Overall Innovative Project”, Beyond Science, 2022.

- Buddhika Galagedarage Dona People's Choice Award (joint), The 'Warts and All' HDR Workshop and Social Event, UOW, 22 Nov 2022

- Aaron Hodges won an award and cash prize for my poster presentation “Simple Determination of Properties for Alkaline Electrolysis” at the ICE 2021 (in 2022) conference. Golden, CO.

- The paper “ A high-performance capillary-fed electrolysis cell promises more cost-competitive renewable hydrogen,” was chosen by the editors of Nature Communications to be featured on an Editor’s Highlights webpage.

- Mitchell St Clair-Glover; Awarded the 2022 Bill Wheeler Award for Bionics Research, including a bursary to support the pursuit of collaborative efforts. Awarded the Best Student Oral Presentation Award at the 30th NSW Stem Cell Network Workshop (3rd November 2022). Awarded the Best HDR Presentation Award at the Australasian Society for Biomaterials and Tissue Engineering NSW Regional Showcase (25th November 2022). Awarded 1st Prize in the MicroWorld category of the University of Wollongong Light Microscopy Image Competition (9th November 2022).



Translation and Engagement

IPRI highly values the times of communication and engagement we enjoy with collaborators, end-users, industry and the communities we work for.

As detailed throughout this report our programs of events and research portfolio maximises engagement to ensure translation.

Highlights have included:

- The continued growth of Hysata – a spin out company based on new electrolyser technology to produce H2.
- The growth of our collaborative ventures with Sicona in the scale up of processing methods for edge functionalised graphene.
- The development of the Axcelda project for cartilage regeneration through the winning of a Medical Research Future Fund Stem Cell grant.
- Completion of Phase 1 Medical Research Future Fund Frontiers program on the Bioengineered Cornea.
- Taking our 3D Bioprinting for skin regeneration with Prof. Fiona Wood and Inventia one step closer to clinical trials.

In addition, we continue to lay the groundwork for new translational platforms to be built in 2023.

These include:

- New Materials and Devices for Electroceuticals.
- Deployable Technologies for Medicine in Space.

We will facilitate progress in these areas through the establishment of workshops on selected topics in preparation for funding opportunities.



Communications

Through utilising a number of various communications platforms and an implemented strategy, IPRI has been a committed to communicate our research findings to a broad audience. Building on the successful communications strategy led by the ARC Centre of Excellence for in Electromaterials Science (ACES), we have continued to effectively showcase the work of our researchers – as well as promote engagement – through web, social media, video, print, radio and other forms of internal and external media.

2022 saw a further increase in the use of social media including the continued utilisation of Facebook, Twitter, LinkedIn, YouTube and Instagram. These platforms maintained consistency, with regular posts each week throughout the year.

@IPRI_UOW

678 followers

@electromaterials

1,400 followers

@IPRI_UOW

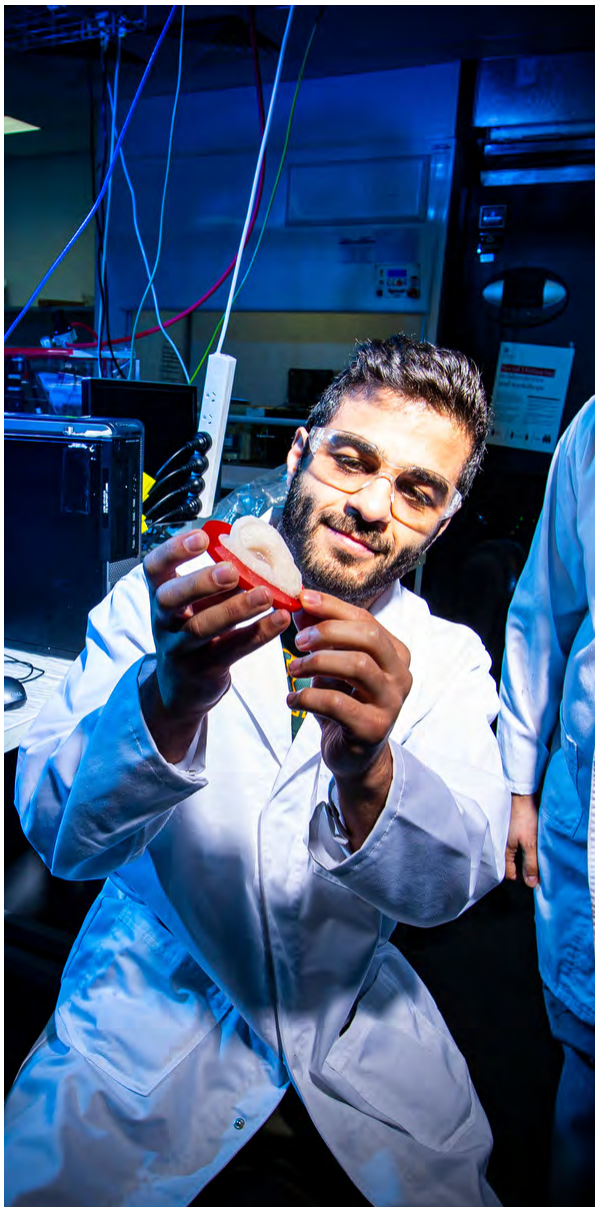
1,350 subscribers

@ipri_uow

372 followers

Intelligent Polymer Research Institute

2,045 followers



Events Held

- ACES Legacy event was held 2-3 December on-line.
- ACES Impact event was held 17 Feb on-line.
- ISO 13485 course by Seerpharma was held for IPRI and TRICEP staff 4-8 April.
- SVHM virtual tour IPRI and TRICEP 13 April.
- Jane Fitzpatrick (new CEO ANFF) tour and presentations IPRI and TRICEP 29 April.
- Leon Kane-McGuire Public Address 4 May.
- UOW St Vincent's Workshop May 15-16.
- Electroceuticals and Organic Electronics Workshop 26 July.
- University of Newcastle ANFF Materials Node Visited July 1.
- Bill Wheeler Symposium August 16.
- IPRI Open Day August 17.
- MBCRC Workshop August 19.
- IPRI Special Seminar Sep 15.
- UOW Med Student Visit Sep 29.
- ANFF Spark Festival Tour October 17.
- Fiona Wood and Mark Fear UWA visit October 14.
- IICA tour October 28.
- Snow Medical Visit October 24.
- Erol Harvey Presentation Nov 4.
- Deployable Technologies for Medicine in Space Nov 6.
- Advanced Materials for Electroceuticals Nov 17.
- ANFF Materials Prototyping Day Nov 23.
- AMTZ Dr Sharma Visit Nov 29.



Refereed Publications 2022

IPRI staff and students produced the following refereed publications during 2022; a total number of publications for 2022 of 115 (not including conference proceedings).

Book Chapters

- C.-Y. Lee, G. G. Wallace, ”3D Printing for Electrochemical Water Splitting’’ in 3D Printing: Fundamentals to Emerging Applications, ed. R. K. Gupta, CRC Press, 2022.
- Lee, C.-Y., Bullock, J.P., Wallace, G.G.; “Earth-abundant electrocatalysts for sustainable energy conversion”, in Sustainable Materials and Green Processing for Energy Conversion, 2022, pp 131-168 DOI: 10.1016/B978-0-12-822838-8.00006-5

Articles

- Zhou, Ying; Fan, Yuchao; Chen, Zhi; Yue, Zhilian; Wallace, Gordon; “Catechol functionalized ink system and thrombin-free fibrin gel for fabricating cellular constructs with mechanical support and inner micro channels”, BIOFABRICATION, 2022, 14(1), 15004, DOI: 10.1088/1758-5090/ac2ef8
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- Carr, Benjamin P.; Chen, Zhi; Chung, Johnson H. Y.; Wallace, Gordon G.; “Collagen Alignment via Electro-Compaction for Biofabrication Applications: A Review” POLYMERS, 2022, 14 (20), 4270, DOI: 10.3390/polym14204270
- Sayyar, Sepidar; Law, Jo; Golda, Agnieszka; Ryder, Gregory; Wallace, Gordon; “Eco-friendly and mechanochemically functionalised graphene with quick and high water dispersibility”, MATERIALS CHEMISTRY FRONTIERS, 2022, 6(18), 2718-2728, DOI: 10.1039/d2qm00310d
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- Cho, Inseong; Dheendayal, Mantra; Wagner, Pawel; Mozer, Attila J.; “Enhanced interfacial electron transfer kinetics between Co2+/3+ complexes and organic dyes with free space near their backbone”, PHYSICAL CHEMISTRY CHEMICAL PHYSICS, 2022, 24 (18), 11183-11195, DOI: 10.1039/d1cp05798g
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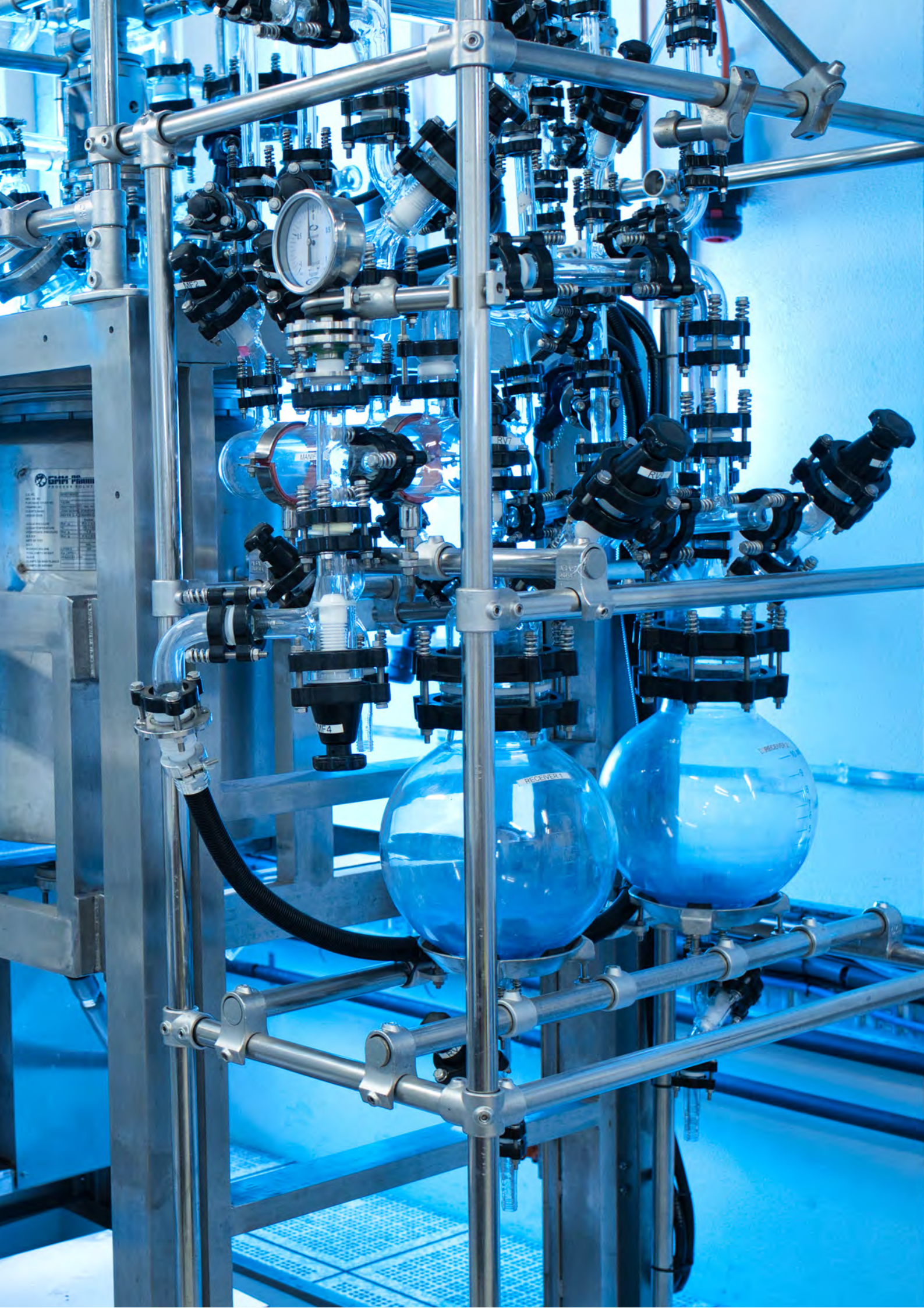
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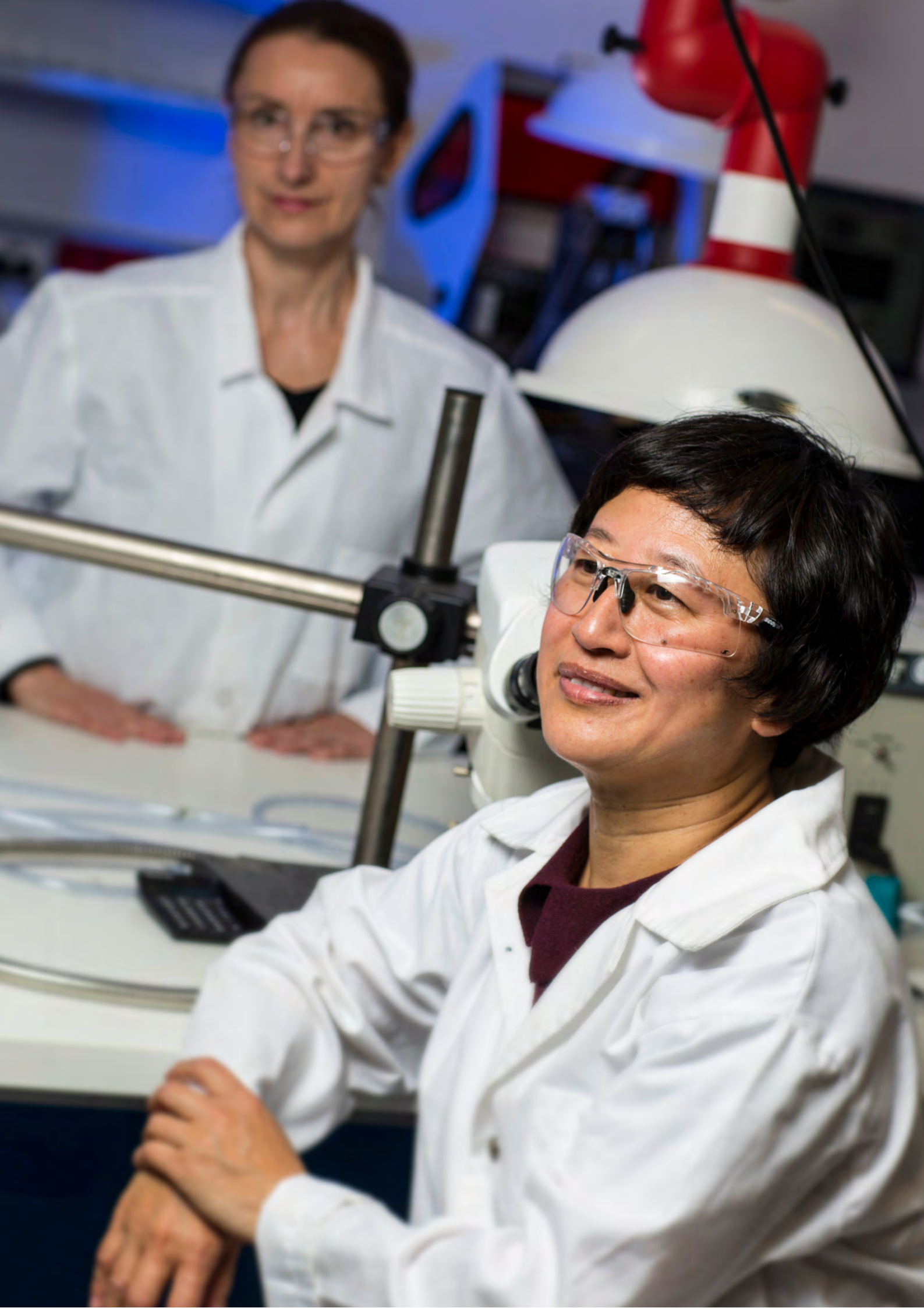

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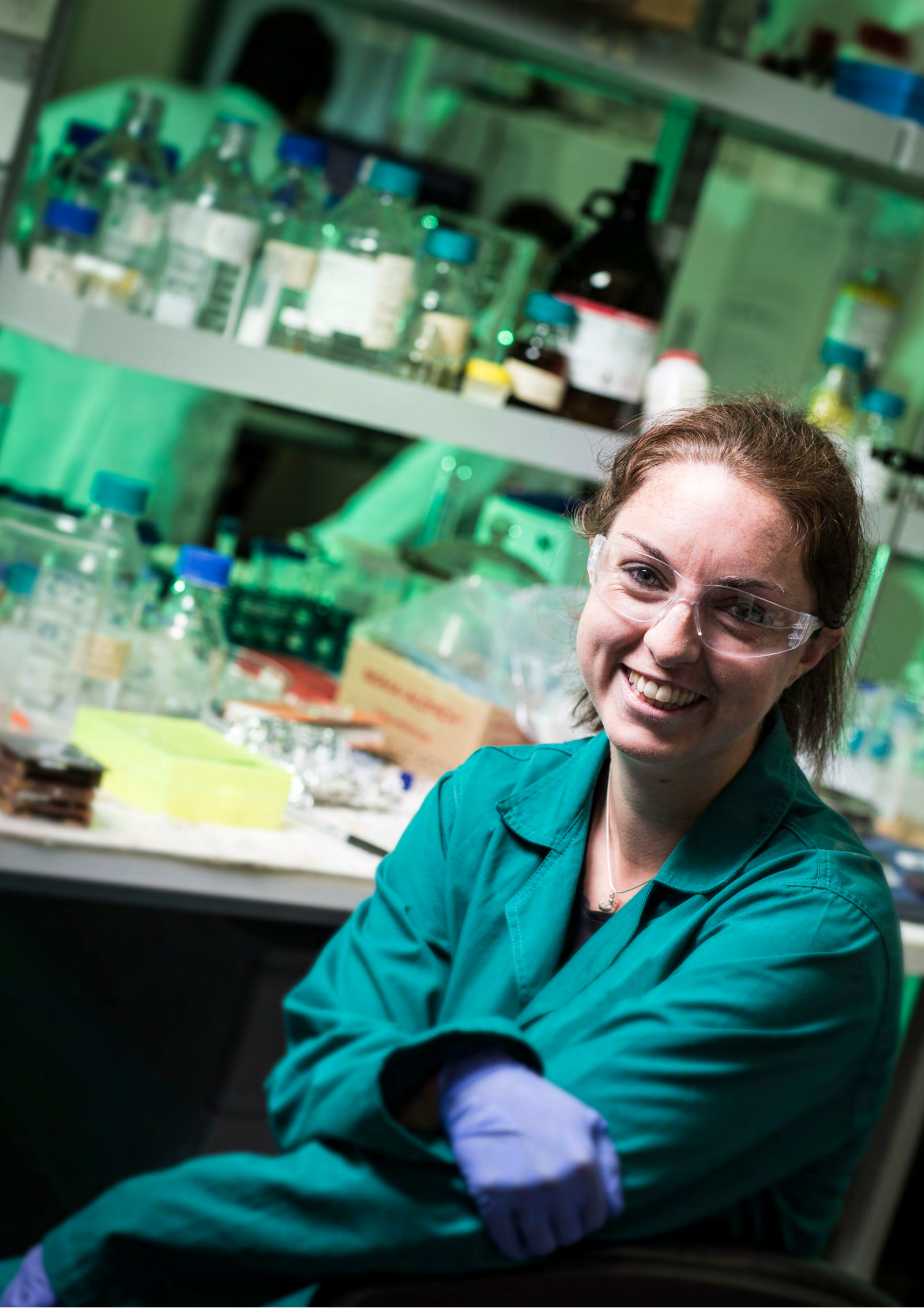

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The IPRI Team

At IPRI people are the foundation for everything we do and achieve.

International Advisory

2022 saw the establishment of an international advisory committee, with terms of reference to provide ongoing input into the IPRI's research and positioning to secure and retain a position of global leadership in science undertaken. The committee will meet twice per year, the first meeting took place in July 2022 and the next meeting planned for February 2023.

IAC Membership 2022

- Prof. Ric Kaner - UCLA (Chair)
- Prof. Gordon Wallace – Director (IPRI)
- Dr Tracey Hanley – Chief Operating Officer (IPRI)
- Dr Anita Hill - CSIRO
- Prof. Maria Forsyth - Deakin
- Prof. Svetha Venkatesh - Deakin
- Prof. Robert Forster - DCU

Staff

IPRI staff team consisted of 39 members in 2022, the full list of IPRI staff members is provided in Table 1. The equity and diversity breakdown of IPRI team is 60% Male and 40% Female, with 40% of staff from culturally diverse backgrounds (Figure 1).

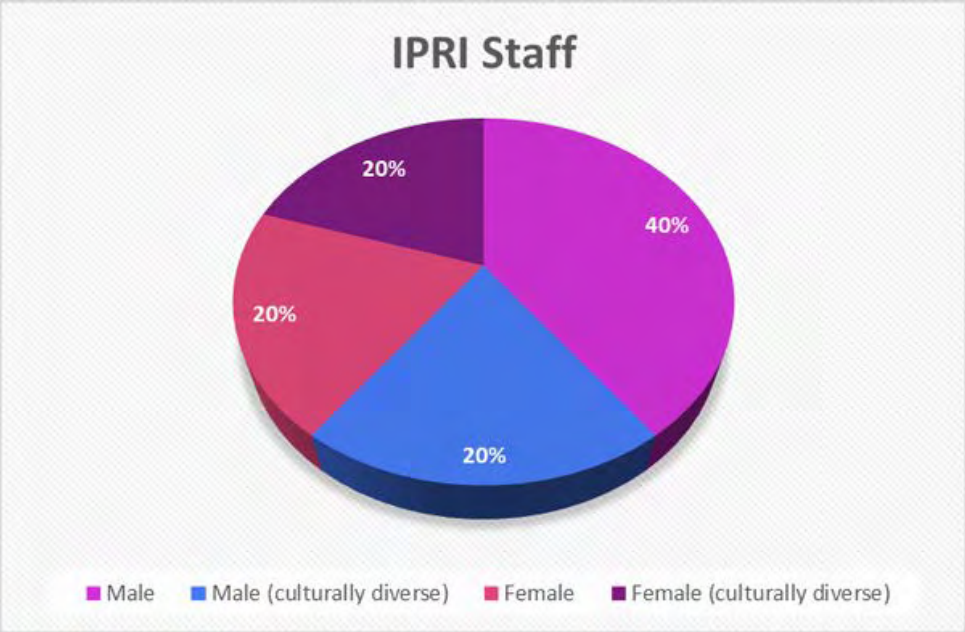
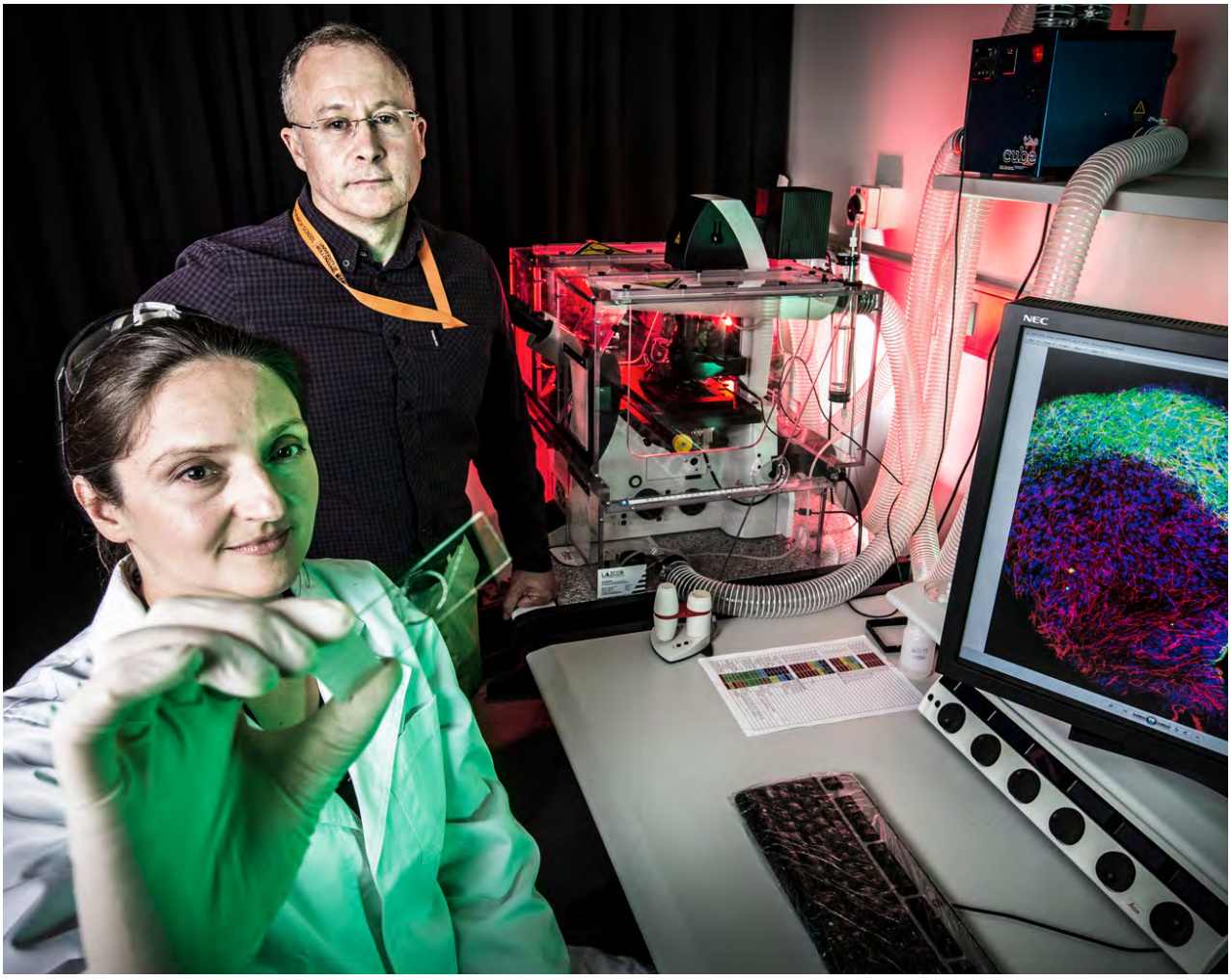


Figure 1: Staff equity and diversity.

Table 1: IPRI Staff Members

IPRI Executive Team	**Position**
Gordon Wallace	Director
Tracey Hanley	Chief Operating Officer
Peter Innis	Associate Director IPRI
Jun Chen	Head of Postgraduate Studies
IPRI Staff Member	**Position**
Cameron Angus	Additive Fabrication Technician
Stephen Beirne	Principal Fellow
Brendan Byatt	Research Assistant
Ros Canales	Research Assistant
Lauren Carson	Quality Management Systems Officer
Zhi Chen	Associate Research Fellow
Johnson Chung	Research Fellow
Renae Clark	Administrative Assistant
Jeremy Crook	Professorial Fellow
Luciana Daikuara	Associate Research Fellow
Sam Findlay	Business and Communications Coordinator
Sanjeev Gambhir	Senior Research Fellow
Patricia Hayes	Analytical Spectroscopy Facilitator
Michael Higgins	Professorial Fellow
Holly Hunt	Research Fellow
Afsaneh Khansari	Research Assistant
Daniel Lawrence	Additive Fabrication Technician
Chong Yong Lee	Senior Research Fellow
Brodie Leeson	Software Development Officer
Xiao Liu	Research Fellow
Attila Mozer	Professorial Fellow
David Officer	Senior Professorial Fellow
Kalani Ruberu	Research Assistant

Andres Ruland	Research Fellow
Greg Ryder	Research Fellow
Sepidar Sayyar	Research Fellow
Phil (Elvis) Smugreski	Administrative Assistant
Jamie Smyth	Research Technician
Gerry Sweigers	Professorial Fellow
Eva Tomaskovic-Crook	Senior Research Fellow
Klaudia Wagner	Senior Research Fellow
Pawel Wagner	Principal Fellow
Caiyun Wang	Principal Fellow
Zhilian Yue	Senior Research Fellow
Ying Zhou	Associate Research Fellow



IPRI Students

The student members of the IPRI team in 2022 consisted of 56 research students (3 Honours, 1 Masters and 42 PhD). 2022 also saw the successful graduation of 15 PhD and 4 Masters students.

Students marked with * graduated during 2022

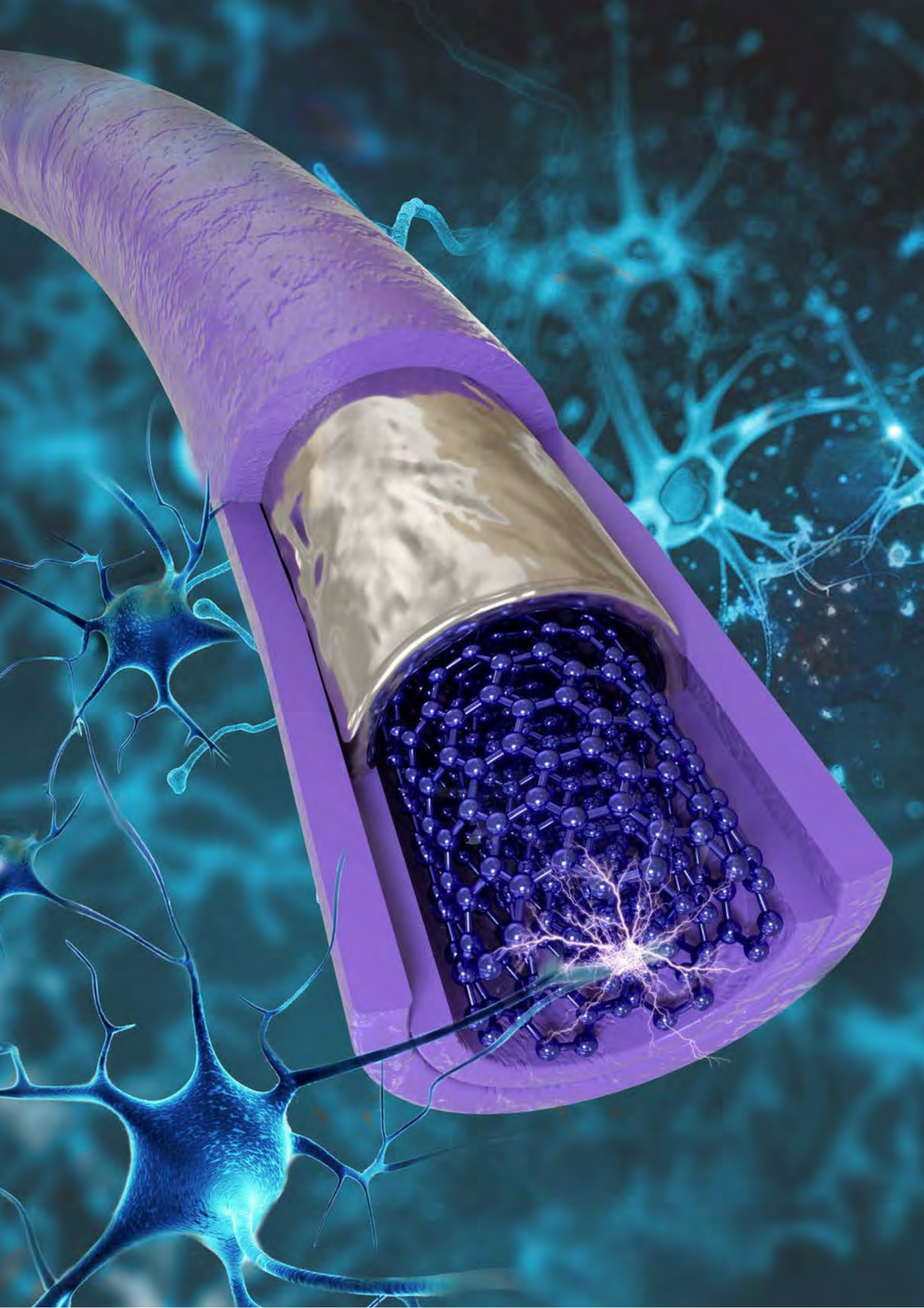
Name	Degree	Thesis Title
Abdul Moqeet Hai *	PhD	Advanced Biofabrication of Functional Silk Fibroin Hydrogels for Tissue Engineering Applications
Alireza Talaei *	PhD	Novel fabrication and characterisation technique for tailoring the physicochemical properties of hydrogels for cartilage tissue engineering
Amruthalakshmi Vijayakumar *	PhD	Engineering Of Nanostructured Metal-Based Catalysts for Electrochemical Reduction of CO2
Chunyan Qin *	PhD	Bipolar Electroactive Conducting Polymers for Wireless Cell Stimulation
David Shepherd*	PhD	Twisted Fibre Artificial Muscles
Grishmi Rajbhandari *	PhD	Coils and antennas for Cochlear Implants
Inseong Cho *	PhD	Effects of Molecular Structure on Interfacial Electron transfer explained by Marcus theory
Jinshuo Zou *	PhD	Electrochemical Reduction of Carbon Dioxide to Formate
Joshua Brooks *	PhD	A Novel Injection Technique for Developing Extruded Nano-Composite Filament for use in Fused Deposition Modelling
Luciana Daikuara *	PhD	Fabricating delivery platforms for wound management and tissue regeneration
Md Habibullah Dalal*	PhD	Electrochemical exfoliation of graphite to graphene
Mohammed Almossawi *	PhD	3D Printed Living Electrodes
Shuai Zhang *	PhD	Versatile Fabrication Methods for Wearable Thermo-electrochemical Cells
Ying Zhou *	PhD	Catechol-functionalized hyaluronic acid and its application in tissue engineering
Yuchao Fan *	PhD	Hydrogel-based 3D hybrid bioprinting towards cartilage application



Aaron Hodges	PhD	Development of a Capillary-fed Electrochemcial Cell
Abdul Azeem	PhD	Graphene based biopolymer neural microelectrodes
Aida Shoushtari Zadeh Naseri	PhD	Development of biocompatible conductive inks for extrusion 3D printer
Atheer Al-Musawi	PhD	Novel Gas-Generating Electrodes whose Catalytic Surface remain Bubble-free in Liquid Electrolyte
Anh Linh Hoang	PhD	Developing electrodes and electrocatalyst structures that provide highly efficient gas-liquid interfaces in alkaline water splitting
Anna Kulaga	PhD	Development of a model for the vascularization of islet laden constructs
Ashfaq Sadman	Hons	Janus extrusion printing using GelMA with 3D REDI
Benjamin Carr	PhD	Mechanically Strong Biomimetic Aorta & Aortic Valve Scaffolding Using Electrocompaction
Buddhika Gayani Galagedarage Dona	PhD	High Throughput Analysis of Single Cancer Cell Forces - Material Interactions: Toward Novel Applications in Cancer Diagnostics and Treatments
Burhan Bin Asghar Abbasi	PhD	Evaluation of moisture driven artificial muscles for atmospheric dehumidification
Carly Baker	PhD	Conducting Polymers for Bioelectronics
Danielle Warren	PhD	3D bioprinted neural tissues
Eileen Wallace	PhD	Development of a 3D Bioprinting Platform to Fabricate Skin Substitutes for Full-thickness Wound Healing with Improved Sensory Function
Emma James	PhD	Direct Piezoelectricity for 3D Cardiac Tissue Engineering and Remodelling
Gerardo Montoya	PhD	Adaptive Neural Interface to Control Prosthetic Device
Jeremy Dinoro	PhD	3D Printing StarPore® for Bone Tissue Engineering
Karri Glass	Hons	3D Printing Bipolar Electrodes for Biostimulation
Kezhong Wang	PhD	Graphene-based fibre for energy and health
Kyuman Kim	PhD	Solar Driven Solar Fuel Generation Using a Redox Mediated Photocatalyst System
Lisha Jia	PhD	Thin 3D MOFs for Electrochemical Catalysis



Malachy Maher	PhD	3D printing Collagen hydrogels for tissue engineering and regenerative medicine
Mantra Dheendayal	PhD	Investigating the effect of donor size in organic dye molecules influencing the electron transfer rates
Michael Potts	PhD	Reactive printing MOF films
Mitchell St Clair-Glover	PhD	Development of an innervated full-thickness skin model by 3D bioprinting
Mohammad Mohammadi	PhD	Development of a cell-laden electric nerve guidance conduit
Munavvar Fairoos Mele Kavungathodi	PhD	Inventive approaches to fabricate highly efficient sensitized solar cell: Change the way to dye-sensitize and to regenerate
Nuwan Dhanushka Hegoda Arachchi	PhD	Fundamental study of protein interactions on multifunctional surfaces (High-speed AFM study)
Praneshwar Sethupathy Kuppanacharry	PhD	Development of Solar Redox Flow Batteries based on DSSCs
Qilong Wu	PhD	Defective Carbon-based Elctrocatalysts
Ritika Kumar	Hons	Development of a sensor for the in-line characterisaiton of bioinks during printing
Robert Nutt	Masters	HA/TCP Bone Regeneration
Sadanan Boochakiat	PhD	Development of Bi–based oxide photocatalysts for simultaneous photocatalytic organic compound degradation and selective reduction reaction
Sarah Higginbottom	PhD	Therapeutic effects of electrical stimulation on a human organoid high-grade glioma model
Sky Jay	PhD	Electrifying 3D Human Neural Tissues for Enhanced Pharmacotherapy
Steven Posniak	PhD	Fabrication of Bioinks to Regenerate Cartilage for Auricular Cartilage Reconstructions
Sujani Abeywardena	PhD	Media/drug delivery and cellular metabolite interactions with threadsin gels
Sulokshana Marks	PhD	3D Fabrication of Remotely Activated, Contactless Electrode for Biomedical Applications
Taniya Munasinghe Arachchige	PhD	Effect of Bacterial–Surface Interactions on Antimicrobial Resistance'
Yeqing Xu	PhD	Carbon Supported Cu-Based Catalysts for Efficient CO2 Electroreduction
Yuetong Zhou	PhD	The Design and Development of Flexible Redox-Gel Integrated Electrode
ZhiQi (Ronald) Chen	PhD	Developing Novel Shear Thickening Electrolytes for Soft Armour Batteries



Current Grants Awarded to IPRI Staff

Funding Details	Team and Project Description	Years
ARC 2023 Discovery Project $978,970 DP230101369	Gordon Wallace, Zhilian Yue, Jun Chen, Mirella Dottori, and Robert Forster “3D Bipolar Electroactive Architectures for Wireless BioStimulation”	2023-2025
ARC 2023 Discovery Project $516,000 DP230101040	Dewei Chu, Caiyun Wang, Dawei Su, Zhaojun Han,and Claudio Cazorla for “Bioinspired Nanoionic Materials for Watt-scale Nano-Hydroelectric Generator"	2023-2025
Tregaskis Foundation Research Grant $75,000	Jeremy Crook, Eva Tomaskovic-Crook for “A multi-modal targeted electrochemotherapy for glioblastoma”	2023-2025
NSW Space Research Network Research Pilot Program SRN-PILOT-2022-20 $150,000	David Officer, Jin Zhang, Chun Wang, Mohammad Islam, and Warren Canning for “Advanced High Temperature Composites for Solid Rocket Motors in Space Launch Vehicles”	2023
Garnett Passe & Rodney Williams Memorial Foundation 2023 Conjoint Grant $125,000	Abdulla Al Maruf, Payal Mukherjee, Jonathan Clark, Jeremy Crook, Hai Xin for “Bio-printed adipose derived stem cells for engineering vascularized bone tissue within an in vivo bioreactor”	2023
UOM Department of Surgery’s Translational Research Grant $80,000	Serena Duchi, Claudia Di Bella, Lilith Caballero Aguilar, Grace Chan, Peter Choong, Carmine Onofrillo, Stephen Beirne, Stewart Ryan for “AxceldaQik™: A one-step surgical procedure for cartilage repair”	2023
2022 LIEF ARC Linkage Project LE230100147	Collaborators from RMIT, Swinburne, Sydney, UQ, Monash, UNSW, and Stephen Beirne (UOW) for “Free Float: A new generation of laser metal 3D printing facility”	2023-2024
Marine Bioproducts Cooperative Research Centre (MB-CRC): $59,000,000	Gordon Wallace and Venus Shell Systems with numerous other collaborators	2022-2032

2021 MRFF Stem Cell Therapies Mission Application ID 2017213 $6,999,671	Peter Choong, Prof Jonathan Clark, Payal Mukherjee, Gordon Wallace, Claudia Di Bella, Simon Moulton, Serena Duchi, Cathal O'Connell, Stephen Beirne, Sanjeev Gambhir, Johnson Chung, Ruta Gupta, Michelle Dowsey, Tim Spelman, David Castle, Nora Shields, Claire Tanner, John Gardner, Samantha Bunzli “Cartilage based stem cell therapies for joint deformity and facial disfigurement. A framework for point-of-care manufacturing and delivery (ARISTOCRAT)”	2022-2027
2021 LIEF ARC Linkage Project LP210301410 $386,356	Gerhard Swiegers; Gordon Wallace; Paul Barrett, “High Efficiency Electrochemical Cells”	2022-2024
ARC 2022 Discovery Project $470,000 DP220101290	Jun Chen, Si-Xuan Guo, and Marco Sacchi for “Ambient electrochemical C-N coupling via co-electrolysis of N2 and CO2”	2022-2024
ARC 2022 Discovery Project $503,862 DP220102872	Brett Paull, Jeremy Crook, Eva Tomaskovic-Crook, and Estrella Sanz Rodriguezs for “Micro-electrofluidic platforms for monitoring 3D human biological models”	2022-2024
SurFebruary Cancer Research Fund grant $96,600	Jeremy Crook, Kim Alexander, Eva Tomaskovic-Crook, Brinda Shivalingam, Michael Buckland, Hao-Wen Sim for “3D bioprinting with glioblastoma ‘ink’: engineering patient-specific brain tumours for high throughput drug screening and individualised therapy”	2022-2023
SurFebruary Cancer Research Fund grant $50,000	Hai Xin, Carlo Pulitano, Jeremy Crook, Jonathan Clark, Eva Tomaskovic-Crook, Abdullah Al Maruf for “Development of an ex vivo perfusion bio-reactor to maintain periosteum for bone reconstruction"	2022-2023
Ian Potter Foundation Medical Research Grant Award $100,000	Jeremy Crook, Eva Tomaskovic-Crook for “DNA Amplification and Tissue Reconstruction for Regenerative Medicine Therapy”	2022-2023
UOW Research Partnership Grant 2022 $20,0000	Xiao Liu and Royal Adelaide Hospital for “Pre-vascularised 3D printed constructs for pancreatic islet transfer and transplantation”	2022-2023
NSW Medical Devices Fund Round 9: $4,941,426	Inventia Life Science Pty Ltd, Dr Fiona Wood Director of Burns Service of WA, Prof Gordon Wallace UOW, “3D Bioprinting System for Intraoperative Skin Regeneration”	2022-2023

AEGis – UOW advancement and equity grant scheme for research #880/007/893 $19898	Johnson Chung and collaborators for 3D Printed Conductive Flexible Strain Sensors for Skin-Interface Electronics	2022
Open Access High Impact Grant Scheme $2,650	Johnson Chung for Collagen Alignment via Electrocompaction for Biofabrication Application	2022
New Frontiers in Research Fund – Transformation 2020 $19,200,000 Application ID: NFRFT-2020-00238	Madden, Wallace & Collaborators “Mend the Gap: A Transformative Biomaterials Platform for Spinal Cord Repair”	2021-2027
NHMRC Ideas Grants: $805,064	Jeremy Crook for his research ‘A wireless electric nerve-guide for peripheral nerve repair’	2021-2026
NSW Government Cancer Institute NSW translational program grant: $3,750,000	Gordon Wallace is co-investigator with team based at Chris O'Brien Lifehouse Centre “Reducing the Morbidity of Head and Neck Cancer Treatment”	2021-2025
Australian Renewable Energy Agency (ARENA) Project	Douglas MacFarlane, Alexandr Simonov, Gordon Wallace, and Gerry Sweigers, "Ammonia Production from Renewables at Ambient Temperature and Pressure. Developing a process for reduction of nitrogen to ammonia."	2021-2024
International Research Staff Exchange	David Officer, Gordon Wallace and collaborators, “DeMANS - Design and Manufacture of Sustainable Materials for Additive Manufacturing”	2021-2022
MRFF 2021 Frontier Health and Medical Research Grant Opportunity (Stage 1): $999,224	Gordon Wallace, Gerard Sutton and collaborators for “Australian Corneal Bioengineering: Novel Therapies to Fight Blindness”	2021-2022
MRFF - 2020 Stem Cell Therapies Mission Grant: $737,689	Gordon Wallace, Zhilian Yue, Pritinder Kaur, and collaborators “Optimizing a preclinical model for bioprinting skin aimed at repairing skin loss in patients”	2020-2022
MTP Connect BioMedTech Horizons Program 3.0	Gordon Wallace, Inventia and collaborators “Developing a 3D bioprinting system for intraoperative skin regeneration”	2020-2022
Australian Research Council (ARC) Future Fellow: $989,000	Michael Higgins for research looking at protein interactions at the interface between a device and its biological environment.	2019-2023

Defence Science & Technology Group (DSTG): $70,000	Wehua Li and Caiyun Wang “Body Armour with Power Storage Capabilities - Developing Battery/Body Armour Materials”	2019-2022
Defence Science & Technology Group (DSTG): $110,000	Caiyun Wang and Jie Ding “Body Armour with Power Storage Capabilities - Developing Novel Shear Thickening Electrolytes”	2019-2022



Stakeholder Engagement

During 2022 IPRI hosted a number of stakeholders for visits and meetings, these are summarised below.

Date	Stakeholder
1/02/2022	Alister Henskens, NSW Minister for Skills and Training, NSW Minister for Science, Innovation and Technology , toured TRICEP facility
16/02/2022	Gordon Stephenson, Research Fellow UNSW, met to discuss Medtech Development projects
17/02/2022	Tim Parsons, CoordinatorNSW Node of SmartSat CRC, visited IPRI
22/02/2022	Angus Taylor, Federal Minister for Energy and Emissions Reductions, Australian Government toured IPRI
24/02/2022	Luca Bottallo, Trade Director, Flanders Government (Province of Belgium). Met with IPRI researchers to discuss future collaboration in clean energy
25/02/2022	NSW Node of SmartSat CRC Interactive Virtual Tour also with Heather Gryst
8/03/2022	David Currow FAHMS is the Deputy Vice-Chancellor(Health and Sustainable Futures) at the University of Wollongong
28/03/2022	Laura Poole-Warren UNSW Graduate School of Biomedical Engineering Biomaterials and Tissue Engineering Cochlear & UNSW Visit
29/04/2022	Jane Fitzpatrick CEO ANFF ANFF Materials Node Access Meeting
2/05/2022	Vish Padmanabahn NSW Government Senior Trade & Investment Commissioner for India & Middle East met with IPRI researchers to discuss clean tech, hydrogen, manufacturing, medtech and critical minerals and METS
6/05/2022	Anoulack Chanthivong NSW Shadow Minister for Finance, Industry and Trade Visit Tour of TRICEP and AIIM Facilities
6/05/2022	Pall Thordarson Director of the UNSW RNA Institute Tour of TRICEP and AIIM Facilities
10/05/2022	TRICEP and AIIM Facilities were toured by multiple industry representatives as part of the UOW - Industry Tour (Manufacturing and Defence) - a two-day industry tour of the University of Wollongong highlighting engineering, automation and regional defence capabilities.
17/05/2022	Stephen Cartwright NSW Government's Agent General for the UK, Europe and Israel (based in London) Tour of TRICEP and AIIM Facilities

17/05/2022	Andrew Parker NSW Government's Senior Trade Investment Commissioner for ASEAN based in Singapore Tour of TRICEP and AIIM Facilities
19/05/2022	Judith Zielke CEO Australian Research Council Tour of AIIM Facility
20/05/2022	Susan Pearce Secretary of NSW Health Tour of TRICEP
24/05/2022	David Allen Ambulatory Care Centre Wollongong Hospital Tour of TRICEP
27/05/2022	Paul Wilkie Senior Manager Prototyping Solutions Sleep Product Development at Resmed Tour of TRICEP
8/06/2022	John Morrison Director of ANFF - C Presentation and Tour of TRICEP
17/06/2022	Erol Harvey CEO ACMD Presentation and Tour of TRICEP
30/06/2022	Tomoko Bylund Head of Sales, APAC Cellink Presentation and Tour of TRICEP
1/07/2022	Paul Dastor Director, Centre for Organic Electronics University of Newcastle Ben Vaughan Adam Fahy Nic Nicolaidis Presentation and Tour of TRICEP
7/07/2022	Alex Baume Lead Biomaterial Scientist Inventia Life Science Presentation and Tour of TRICEP
7/07/2022	Zack Artist Senior Biomedical Engineer Inventia Life Science Presentation and Tour of TRICEP
21/07/2022	Russel Jones Managing Director The Iron Back Meeting including tour of TRICEP
16/08/2022	Johnathan Clark Lang Walker Family Foundation Professor and Chair in Head and Neck Cancer Reconstructive Surgery University of Sydney Presentation and Tour of TRICEP
16/08/2022	Johnathan Clark Lang Walker Family Foundation Professor and Chair in Head and Neck Cancer Reconstructive Surgery University of Sydney Presentation and Tour of TRICEP
17/08/2022	Jihad Dib MP - NSW Shadow Minister for Energy, Climate Change and Emergency Services AIIM Tour
7/10/2022	Harry Schlen Clinical Director MoreDent - Digitally mastered dentistry Presentation and Tour of TRICEP
10/10/2022	Bruce Ashford Surgeon NSW Health - Wollongong Hospital Tour of AIIM Facility and TRICEP

11/10/2022	Paul Ang Research Fellow UNSW TRICEP Tour
11/10/2022	Maruf Al Maruf Reconstruction Research Assistant/Head and Neck Surgery Chris O'BrienLifehouse AIIM Tour
14/10/2022	Fiona Wood Plastic and Reconstruction Surgeon Fiona Wood Foundation Workshop - LKM Theatre
14/10/2022	Mark Fear Senior Scientist Fiona Wood Foundation Workshop - LKM Theatre
24/10/2022	Derek Van Dyk Director, Strategy Snow Medical Tour AIIM/TRICEP and Presentation in LKM Theatre
24/10/2022	Brian Murphy Project Manager Snow Medical Tour AIIM/TRICEP and Presentation in LKM Theatre
28/10/2022	IPRI facilities were toured as part of UOW's Innovation and Commercial Research Unit, showcase of UOW research capabilities to a delegation of manufacturing and engineering businesses in collaboration with the Institute of Instrumentation Control and Automation
4/11/2022	John Morrison Director, Commercialisation ANFF Presentation at AIIM and Tour of TRICEP
17/11/2022	Mario Romero-Ortega Director of undergraduate program, Department of Biomedical Engineering Univeristy of Houston Presentation - Advanced Materials and Electroceuticals Workshop - LKM Theatre
21/11/2022	Philip Bowler Maverick Biomaterials Pty Ltd Presentation and TRICEP Tour
23/11/2022	Ben Vaughan University of Newcastle Charge around Australia Event/ANFF Materials Prototyping Event
29/11/2022	Jitendra Sharma Managing Director AMTZ Presentation at AIIM and Tour of TRICEP

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Conference Attendances

IPRI staff and students attended many conferences during the year to facilitate dissemination of information and networking with the broader community. The details of the 38 presentations are listed below; with 6 Plenary/ Keynotes, 12 invited talks, 13 orals, 2 short talks, and 5 posters.

Presenter	Conference	Date	Type	Title
Buddhika Galagedarage Donn	33rd Australian Colloid and Surface Science Student Conference	31 Jan - 2 Feb	Poster	High throughput analysis of single cell - material interactions: toward novel applications in cancer diagnostics and treatments
Nuwan Arachchi	33rd Australian Colloid and Surface Science Student Conference	31 Jan - 2 Feb	Oral	“Watching” dynamics of single-molecule proteins during adsorption on functionalised silica nanoparticle coatings using high-speed AFM
Aaron Hodges	6th International Conference on Catalysis and Chemical Engineering (CCE), San Francisco	23-24 Feb	Virtual	“Bubble Free” Water Electrolysis that is Highly Efficient
Aaron Hodges	F&R Energy, Houston, USA	15-17 Feb	Virtual	A High-performance Electrolysis Cell Promises more Cost-competitive Renewable Hydrogen
Chong-Yong Lee	VI International Conference onCatalysis and Chemical Engineering, California, USA	22-26 Feb	Invited	3D printing for electrocatalysis
Aaron Hodges	3rd Advanced Chemistry World Congress, London, UK	21-22 Mar	Oral	A High-Performance Electrolysis Cell Promises More Cost Competitive Renewable Hydrogen
Gerry Sweigers	ATSE Hydrogen Workshop	30 Mar	Invited	A High-Performance Electrolysis Cell Promises More Cost Competitive Renewable Hydrogen
Linh Hoang	Advanced Energy Materials Conference, London, UK	6-8 Apr	Oral	A High-Performance Electrolysis Cell Promises More Cost Competitive Renewable Hydrogen
Gordon Wallace	27th Annual Conference of the Australasian Society for Biomaterials and Tissue Engineering (ASBTE)	20-22 Apr	Oral	Getting bioprinting into the clinic
Buddhika Galagedarage Dona	27th Annual Conference of the Australasian Society for Biomaterials and Tissue Engineering (ASBTE)	20-22 Apr	Oral	High throughput analysis of single cell - material interactions: toward novel applications in cancer diagnostics and treatments
Nuwan Arachchi	27th Annual Conference of the Australasian Society for Biomaterials and Tissue Engineering (ASBTE)	20-22 Apr	Oral	High-Speed AFM for direct visualisation of single-molecule protein adsorption dynamics on functionalised silica nanoparticle coatings
Eileen Wallace	27th Annual Conference of the Australasian Society for Biomaterials and Tissue Engineering (ASBTE)	20-22 Apr	Poster	Fabricating Multi-Material Tissue Engineering Scaffolds using Janus Bioprinting

Gordon Wallace	Seaweed Around the Clock	2-Jun	Keynote	Developing seaweed polymers as a real alternative for food packaging
Aaron Hodges & Gerry Sweigers	3rd International Conference on Electrolysis, Colorado, USA	20-23 Jun	Invited	A High-Performance Electrolysis Cell Promises More Cost Competitive Renewable Hydrogen
Aaron Hodges	3rd International Conference on Electrolysis, Colorado, USA	20-23 Jun	Poster	Simple Determination of Properties for Alkaline Electrolysis
Linh Hoang	23rd World Hydrogen Energy Conference ('WHEC-2022'), Instanbul, Turkey	26-30 Jun	Oral	A High-Performance Electrolysis Cell Promises More Cost Competitive Renewable Hydrogen
Gordon Wallace	12th International Nanomedicine Conference	27-29 Jun	Plenary	Graphene - the wonder material!
Gerry Sweigers	2022 International Symposium on Clean Energy Materials (ISCEM2022)	30 Jun-2 Jul	Invited	A High-Performance Electrolysis Cell Promises More Cost Competitive Renewable Hydrogen
Carly Baker	PolyNSW ECR Symposium	1-Jul	Poster	Improving the electronic properties of a cholesterol-functionalised conducting polymer via a TEG chain-spacer
Gordon Wallace	RACI 2022 National Congress, Brisbane Convention and Exhibition Centre	3-8 Jul	Keynote	Getting graphene into shape
Caiyun Wang	RACI 2022 National Congress, Brisbane Convention and Exhibition Centre	3-8 Jul	Invited	Tuning Conducting Polymers for Energy Applications
Carly Baker	RACI 2022 National Congress, Brisbane Convention and Exhibition Centre	3-8 Jul	Oral	Conducting polymers functionalised with cholesterol for bioelectronics
Gordon Wallace	UOW-SKKU Symposium	17-20 Jul	Keynote	Graphene - an extraordinary line of communication to biological systems
Caiyun Wang	UOW-SKKU Frontier Materials Workshop	18-19 Jul	Invited	Interface Engineering of Metal-Based Catalysts for Carbon Dioxide Electroreduction
Chong-Yong Lee	Taipei International Conference on Catalysis, Taiwan	20-22 Jul	Invited	Towards solar fuels from water and CO2
Gordon Wallace	ACS Award in Applied Polymer Science: Symposium in Honor of Richard B. Kaner" Symposium	21-25 Aug	Oral	Graphene - the wonder material!
Gerry Sweigers	Energy Oceania 'Global Renewable Energy Meet'	29-31 Aug	Invited	A High-Performance Electrolysis Cell Promises More Cost Competitive Renewable Hydrogen
Gordon Wallace	E&P Healthcare Conference	6-7 Sep	Invited	The convergence of advances in Biomaterials, stem cells and 3D Biofabrication - the impact on healthcare



Gordon Wallace	Australasian Wound & Tissue Repair Society, 2022 Scientific Meeting (AWTRS2022)	12-14 Sep	Invited	“Hurdling” towards translation of 3D Bioprinting
Kalani Ruberu	Australasian Wound & Tissue Repair Society, 2022 Scientific Meeting (AWTRS2022)	12-14 Sep	Oral	Optimising a Preclinical Model for Bioprinting Skin Aimed at Repairing Skin Loss in Patients
Mitchell St Clair Glover	Australasian Wound & Tissue Repair Society, 2022 Scientific Meeting (AWTRS2022)	12-14 Sep	Oral and Poster	Bioprinting neural crest cells for in situ differentiation to functional sensory neurons
Eileen Wallace	Australasian Wound & Tissue Repair Society, 2022 Scientific Meeting (AWTRS2022)	12-14 Sep	Poster	Navigating the Clinical Deployment of 3D Bioprinting for Skin Regeneration
Linh Hoang & Gerry Sweigers	5th Industry Workshop on Advanced Alkaline Electrolysis, Dresden, Germany	28-29 Sep	Invited	A High-Performance Electrolysis Cell Promises More Cost Competitive Renewable Hydrogen
Gordon Wallace	Self-Assembly Meets Additive for Durable Supply Chains and Transformative Manufacturing (SAMAM CES) Symposium	29 Nov – 1 Dec	Keynote	3D Bioprinting is 4D Printing!
Mitchell St Clair Glover	Tissue Engineering and Regenerative Medicine International Society – Asia Pacific (TERMIS-AP) Chapter Meeting 2022, Jeju International Convention Centre, South Korea	5-8 Oct	Oral	Biomaterials as an ECM for in vitro models: Development of an innervated full-thickness human skin by 3D bioprinting
Anna Kulaga	Tissue Engineering and Regenerative Medicine International Society – Asia Pacific (TERMIS-AP) Chapter Meeting 2022, Jeju International Convention Centre, South Korea	5-8 Oct	Poster	A novel biofabrication process to generate vascularised 3D bioprinted constructs to support islet transplantation
Mitchell St Clair-Glover	30th NSW Stem Cell Network Workshop, Westmead, NSW	3-Nov	Oral	Bioprinting neural crest cells for in situ differentiation to functional sensory neurons
Gordon Wallace	Deployable Technologies for Medicine in Space Workshop	6-Nov	Oral	Engineering the Solution
Tracey Hanley	Deployable Technologies for Medicine in Space Workshop	6-Nov	Oral	Opportunities to Engage
Gordon Wallace with Peter Choong	International Humans in Space Summit 2022	7-8 Nov	Invited	Deployable technologies for Medicine in Space
Gordon Wallace	13th International Conference on Recent Progress of Graphene and Two-Dimensional Materials Research (RPGR2022)	13-17 Nov	Keynote	Fabrication of Structures containing Graphene
Gordon Wallace	Molecular Horizons Special Seminar	14-Nov	Oral	Paving the Path to Translation
Caiyun Wang	Advanced Materials and Electroceuticals Workshop	17-Nov	Oral	Materials for implantable power sources
Eileen Wallace	4th Australian Bioprinting Workshop for Tissue Engineering and Regenerative Medicine	1-2 Dec	Oral	Point of Care Bioprinting for Skin Regeneration after Burn Injury
Mitchell St Clair-Glover	4th Australian Bioprinting Workshop for Tissue Engineering and Regenerative Medicine	1-2 Dec	Oral	Bioprinting neural crest cells for in situ differentiation to functional sensory neurons

Mitchell St Clair-Glover	Australasian Society for Biomaterials and Tissue Engineering – NSW Regional Showcase, UNSW, Sydney	1-2 Dec	Oral	Bioprinting neural crest cells for in situ differentiation to functional sensory neurons
Mitchell St Clair-Glover	Australasian Neuroscience Society (ANS) Conference 2022, Melbourne	5 -7 Dec	Poster	Bioprinting neural crest cells for in situ differentiation to functional sensory neurons
Andres Palaia	4th International Conference on Medical Imaging and Therapeutics	7-8 Dec	Oral	Reference Phantom Method for Ultrasonic Imaging of Thin Dynamic Constructs
Carly Baker	Pacific Polymer Conference (PPC17)	11-14 Dec	Oral	Conducting polymers functionalised with cholesterol for biointerface applications





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