



Sydney Knowledge Hub

Year in Review 2022

## A Note From The Director

The Sydney Knowledge Hub has become a hive of activity this year. Our open doors have brought through nearly two dozen companies, 149 members, 75 events produced or hosted, and a new mentoring program. We strive to create a welcoming 'front door' that serves as both an entrance for innovative small businesses and as an egress for research to leave campus and impact our lives.

The relationships that start in the space often develop into new partnerships for the University of Sydney, leading to collaborations with our researchers, technical work within Core Research Facilities, and work experiences for our students.

In its third year of operations, we have brought more visibility to the different stages of research translation and commercialisation and have worked on initiatives to help improve outcomes. Through the highly collaborative Research Entrepreneur Experience project led by the Sydney Knowledge Hub, the University gained a deeper understanding of the obstacles faced in the research entrepreneurship journey. This has led to vibrant new initiatives from teams like the Charles Perkins Centre, the Business School, and the Commercialisation Office to help our researchers better understand and navigate research commercialisation.

Sydney Knowledge Hub has served as a beacon to our researchers and support staff that the University of Sydney is a champion of research commercialisation.



**Rupal Ismin**Director
Sydney Knowledge

Hub

## The Team



Rupal Ismin
Director



**Greta Stevens**Community & Operations Manager

## Thank you to our broader team:

Andrew Duong, Jed Austin, Kate Mintah-Owusu, and Sarka Bousova

## **Governing Council**

### **Dr Andrew Tindell**

Principal Enterprise Officer

### **Prof Emma Johnston**

Deputy Vice-Chancellor Research

## **Prof Julie Cairney**

Pro Vice-Chancellor (Research - Enterprise)

## **Prof Ken-Tye Yong**

Associate Dean, (External Engagement), Faculty of Engineering

### **Kirsten Andrews**

Vice-Principal (External Relations)

#### **Prof Mark Rees**

Deputy Executive Dean (Research Partnerships), Faculty of Medicine and Health

### **Prof Philip Gale**

(Interim Dean), Faculty of Science

### **Prof Richard Miles**

Pro Vice-Chancellor (Education – Enterprise and Engagement), Pro Vice-Chancellor (Academic Excellence)

### Rupal Ismin

Director, Sydney Knowledge Hub





"Having startups and innovative small businesses on our campus, working closely with our researchers and students, is inspiring. External facing events and meetings held at the Sydney Knowledge Hub show a side of the University of Sydney that our partners often don't expect"



**Prof Julie Cairney**Pro Vice-Chancellor Research (Enterprise)

## **Top Level Highlights**

# By the numbers

149
Members

24 Member organisations

5 Ave size of team in space

Ave startup FTE growth since becoming a member

\$16 million Govt grant funding received

\$11.4

Investment received by the "early stage venture" members\*

Internships provided for USYD students

\$5.2 million

University research income from member collaborations

# A few of the successes our members have achieved this year:

- ResusRight released their first training product, the Juno Training Monitor, to help train clinical staff on best practice for resuscitating premature babies.
- VirtuPharma, the world's first cloud-based science laboratory, successfully expanded their International Patent into USA, Europe and Singapore.
- FootprintLab Co-Founder and PhD student Janet Salem won the UNSW Faculty of Engineering Ada Lovelace Medal for her distinguished research in carbon data and Climate Tech.
- BCAL Diagnostics is developing a new Sydney-based clinical services laboratory as a testing site for their ongoing clinical program to advance breast cancer diagnosis through blood tests
- OrthoDx raised \$3.7 million in funding and won Best Emerging Technology in Orthopaedics awarded by the International Society of Anthroplasty.
- GreenCoat received a Tech for Social Good Impact Fellowship empowering the next generation of responsible tech leaders.
- Resonait accelerates through Founders Health 10x, Cicada Innovations Health Tech Connect, and Startmate with its medical device finding new pathways to treat depression.
- Sydney Quantum Academy hosted the first Australian quantum conference, with over 800 registrants and Google, CSIRO, IBM, PsiQuantum, and Quintessence Labs as sponsors.



Australia's Chief Scientist Dr Cathy Foley delivers the keynote in February's Quantum Australia Conference

88%

of member organisations have collaborated with researchers at the University of Sydney during their time here

<sup>\*</sup> Members self-categorize their organisation into "early-stage venture", "non-profit" or "established organisation".

This investment figure includes self-declared equity investment into early-stage ventures member organisations.



Janet Salem, Founder of FootprintLab, with the Ada Lovelace Medal for Outstanding Engineer, as presented at the UNSW Women in Engineering Awards. Photograph: Maja Baska.

## **Supporting Net Zero**



The Sydney Knowledge Hub was a proud partner of the 2022 Net Zero Initiative and Circular Economy Conference, supporting startups contributing to reaching net zero including:



Co-founded by Janet Salem, PhD Candidate, and Assoc Prof Tim Baynes, FootprintLab is making the best data on carbon footprints accessible, transparent, and easy-to-use.



Co-founded by Oliver Pang with advisor Dr Behnam Akhavan, GreenCoat uses plasma coatings for windows to improves energy efficiency of buildings.

H2POTENTIAL

Co-founded by Prof Franscois Aguey-Zinsou, H2Potential consults and incubates new technologies to enable growth in the hydrogen market.



Founded by Prof PJ Cullen, PlasmaLeap uses atmospheric plasma to replace our use of chemicals on food, water, and in agriculture, as well as for energy and CO2 conversion.

"It has been a great partnership with the SKH to develop the research translation and commercialisation ecosystem for researchers here. We look forward to supporting SKH to deliver its program next year — together we have planned a number of events and programs for education and capacity building research entrepreneurs."



Dr Stephen Lam
Acting Head of the
Commercialisation Team

## **Member Snapshot**

24 organisations have located their businesses at the Sydney Knowledge Hub this year. From solo research entrepreneurs to ASX listed companies, we host a hive of entrepreneurial talent.

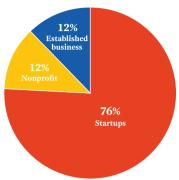
This year we also celebrated three organisations outgrowing the space, including Bioscout and PlasmaLeap Technologies, which moved into their own bespoke facilities, and Sydney Quantum Academy, which moved into Tech Central's Quantum Terminal.

100%

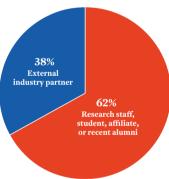
of member organisations say the Sydney Knowledge Hub has significantly improved their connection to other parts of the University.



# Member Organisations by Type



## Leadership's Relationship with the University of Sydney



# Our Value to Members

### **Space**

Coworking space: Helping members access facilities such as collaboration and event spaces, Core Research Facilities, Hardware Lab, and other spaces around the University.

## Community and Events

Peer-to-peer learning, capacity building, and networking opportunities through curated events, workshops and discussions.

## Wayfinding Within and Outside of the University

Connecting members to people at the University and expanding researchers' network in industry.

"The excellent, multi-functional spaces and the ongoing intellectual and commercial savviness available through its networks and visiting speakers provide first-class opportunities for startups."



Prof Patrick Brennan
CEO / Co-Founder, DetectedX

<sup>\*</sup> Snapshot as of October 2021.

<sup>&</sup>quot; Snapsnot as of October 2021. \*\* "Recent" refers to within five years.

## Sydney Knowledge Hub Member Organisations in 2022

**Andi Health** HealthTech. **Digital Health** 

Andi Health's proactive health program bundles connected health devices, health analytics and online health coaching into one holistic and affordable monthly service.



#### **Archer Materials**

Advanced Manufacturing, BioTech, Semiconductors, Quantum

Archer is a technology company developing advanced semiconductor devices, including processor chips that are relevant to quantum computing.

## **ARCHER**

### **BCAL Diagnostics**

Diagnostics, BioTech

BCAL Diagnostics is developing and commercialising a universal screening test for early detection of breast cancer by analysing lipids in the blood.



www.bcaldiagnostics.com

#### **BioScout**

AgTech, Smart Sensing

BioScout utilises state-of-the-art technology to detect and prevent airborne diseases allowing for proactive disease management on farms worldwide.



www.bioscout.com.au

#### **BrainConnect**

Advanced Manufacturing, AI/ML, Digital Health, **Smart Sensing** 

BrainConnect is a stealth startup developing novel solutions in long-term interfacing with the brain and body.

## Brain **III**⊪Connect

www.brainconnect.com.au

## **Bush Heritage**

Conservation, Environment

Bush Heritage Australia's aim is to return the bush to good health working closely with researchers at the University. They buy and manage land, partnering with Aboriginal people and other groups.



www.bushheritage.org.au

## Conveyor Manufacturing Australia

ClimateTech, CleanTech, Energy, Industrials, Civil/ **Construction Engineering**  Innovative belt conveyor technologies to materially improve safety, dramatically lower haulage emissions, and reduce reliance on personnel in bulk materials handling.



www.cmacv.com

#### CruxML

AI / ML, Defence

CruxML provides foundational technology for real-time and embedded machine learning.



## DetectedX

EdTech, MedTech

DetectedX is a start-up medical education technology company created at the University of Sydney that transforms disease detection through intelligent. interactive, web-based educational programs for any clinician or student interested in medical imaging.



www.detectedx.com

#### Enigma2

AI / ML, NLP, Media

Enigma2: Opening a World of Entertainment. Enigma2 allows for foreign films to be transformed to English with Al: Neural Rendering.



www.enigma2.ai

## **Equinox Medical**

MedTech, BioTech

Equinox designs, manufactures, and distributes high-quality medical devices throughout Australia and New Zealand. Products include orthopaedic implants, pathology diagnostic systems, operating theatre consumables and PPE.



www.equinoxmedicalgroup.com

#### **FootprintLab**

ClimateTech, Big Data, FinTech, Sustainability

FootprintLab is the expert source of credible carbon footprint data. They are empowering climate solutions by making Scope 3 emissions intensities accessible, transparent, and easy-to-use.



www.footprintlab.com.au

# GRADIENT

INSTITUTE www.gradientinstitute.org

## **Gradient Institute**

Al. Social

Gradient Institute research which design choices for Aldriven decision-making systems will lead to more ethical decisions to assist organisations to deploy Ethical Al Systems.

### GreenCoat

Advanced Manufacturing, CleanTech, ClimateTech, Smart Sensing, PropTech.

GreenCoat is a next-generation plasma coating smart window solution that changes the opacity of windows in response to real-time environmental conditions to improve the thermal insulation and energy efficiency of buildings by reducing unwanted heat transfer through windows.



www.bit.ly/greencoat-tech

#### **H2Potential**

CleanTech, Energy, Sustainability

H2Potential is a consulting company focused on Hydrogen. Our goal is to enable growth in Hydrogen market and incubate new technologies to do so.

## **H2POTENTIAL**

www.nzpotential.com

#### Neurgeon

MedTech, AI/ML, Semi-Conductors

Neurgeon is developing closed-loop solutions, including software and hardware, to accelerate post-stroke rehabilitation based on decoding the brain's unique 'thought' associated with a movement.



www.neurgeon.com

#### OrthoDx Diagnostics, BioTech

OrthoDx is a diagnostics company focused on the differentiation of joint pain using molecular techniques.



ORTHODX

www.orthodx.com.au

## **Our Futures**

EdTech, Social

Innovative and engaging evidence-based health education courses to empower students to improve their health and wellbeing



www.ourfutures.education

## **PlasmaLeap Technologies**

CleanTech, Advanced Manufacturing

PlasmaLeap uses atmospheric plasma to replace our use of chemicals, for water, food & agricultural applications. They are also using plasma for energy & CO2 conversion.



www.plasmaleap.com

#### **Pharos Therapeutics** BioTech, Al

Pharos Therapeutics develops novel drug for rare and refractory diseases using "Chemiverse", a new drug development platform using AI technology.



www.pharos-therapeutics.com.au

## Resonait

MedTech, AI/ML, Big Data

Resonait is developing a new medical device for depression treatment to accelerate the pathway to recovery for depression patients.



www.resonait.com

## ResusRight

MedTech, AI/ML

ResusRight was founded by a group of clinicians and engineers with a shared mission to improve outcomes for infants that need resuscitation at birth by creating technology that empowers clinicians to deliver high quality care.



www.resusright.com

## **Sydney Quantum** Academy

Quantum

Collaborating with academia, industry and government, SQA harnesses Sydney's collective quantum expertise to develop diverse talent and a globally recognised quantum ecosystem.



www.sydneyguantum.org

#### VirtuPharma

Big Data, Robotics, AI/ML, Life Sciences VirtuPharma is a cloud -based remote lab platform with data automation for borderless experiments, training, and regulatory compliance.



## Researcher Collaboration

Member organisations collaborate with university researchers, Core Research Facilities, and students. The Sydney Knowledge Hub has strong ties to faculties, schools, and portfolios to make these introductions.

of member organisations have collaborated with researchers during their time at the Sydney Knowledge Hub.



Equinox Medical leads the ichallenges for students in Medivate, a hackathon led by the Sydney University Society for Medical Innovation.

"Our quadrangle at the Sydney Knowledge Hub is an excellent environment to collaborate with other faculties to assist with our key innovation projects such as orthopaedic prostheses and instrument design and 3D laser printing prototypes.

The Sydney Knowledge Hub provides Equinox Medical a collaboration space and an innovation ecosystem to improve our commercialisation outcomes. Much of the work at the Knowledge Hub is done in collaboration with the highly experienced staff from other parts of the University such as at the Sydney Manufacturing Hub".

**Annabel Sweeney** Medical Consumables Manager, Equinox Medical

## **Grant Funding**

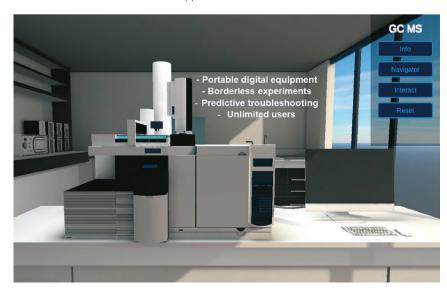
Members have taken advantage of commercialisation and development funding by NSW State and Federal Governments. Most of our startups receiving the NSW MVP grant. Other grant funding included:

- DetectED-X and ResusRight joined Bioscout this year as recipient of the Accelerating Commercialisation (AC) grant
- ResusRight also received \$800k from the BioMedTech Horizons grant, part of the Medical Research Future Fund
- To help fund overseas expansion, Virtupharma and CruxML received the Export Market Development Grant
- To support their clinical trials, BCAL Dx received \$100k through the NSW Health Biospecimen Collection Grant
- Archer was awarded an Innovation Connections grant
- Two ARC Linkage grants were granted to members, including Gradient and Bush Heritage

## **Spotlight**



Since becoming a member in 2020, Virtupharma has been working with the School of Pharmacy. Virtupharma is now creating "digital twins" of the school's high-end equipment connected with industry for remote access and training on industrial settings. This virtual access enables unlimited users to have personalised training with more throughput on the machines and creates new revenue opportunities for its users.



## **Core Research Facilities**

Members of the Sydney Knowledge Hub conduct their advanced development in the Core Research Facilities at the University of Sydney. These facilities provide access to high-end research infrastructure and support a range of research services.

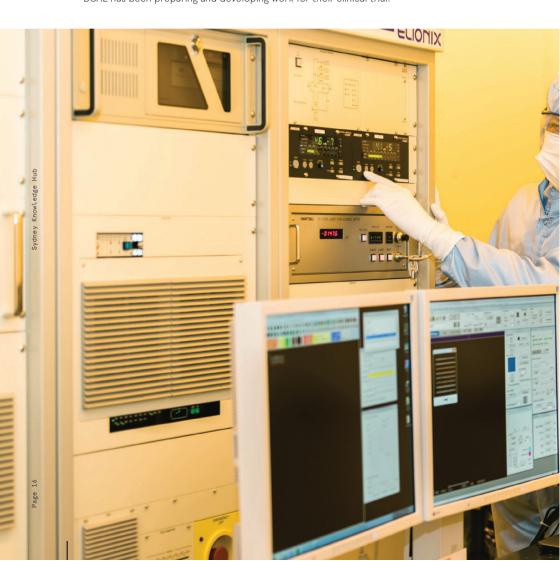
## • Research and Prototype Foundry

Archer Materials is developing a room temperature quantum computing chip in the Research and Prototype Foundry, located at the Sydney Nano Institute.

## • Sydney Mass Spectrometry

BCAL Diagnostics has been expanding their research and development in Sydney Mass Spectrometry, located in the Charles Perkins Centre.

BCAL has been preparing and developing work for their clinical trial.



## Sydney Analytical

ResusRight took advantage of the dedicated to materials, chemical, and biological analysis of Sydney Analytical. The facility provides state-of-the-art instruments and technical expertise for sample characterisation within capabilities including vibrational spectroscopy, x-ray techniques, magnetic resonance, and drug discovery.

### Sydney Manufacturing Hub

Archer Materials and Equinox Medical worked in the Sydney Manufacturing Hub, which enables concept-to-production demonstration capabilities including advanced pre- and post-processing materials.



## **Incubation**

The Sydney Knowledge Hub has helped hundreds of researchers understand more about commercialisation and the resources available to support their journey. This year, initiatives were produced in partnership with teams across then University including the Business School, Charles Perkins Centre, Waste Transformation Research Centre, the Faculty of Medicine and Health, INCUBATE, and the Commercialisation Office.

The Sydney Knowledge Hub served as a home for 13 early-stage ventures led by current academic and student researchers at the University of Sydney including:



#### **BrainConnect**

**Dr Omid Kavehei,**Biomedical Engineering



### **FootprintLab**

**Janet Salem,** PhD Student, Science



#### **H2Potential**

Prof Kondo-Francois, Aguey-Zinsou, Chemistry



### Neurgeon

**Brown Xu,** PhD Student, Engineering



#### **OrthoDx**

**Antony Rapisarda,** PhD Student, Faculty of Medicine and Health



### **PlasmaLeap**

**Prof PJ Cullen,** Chemical and Biomolecular Engineering



### **DetectedX**

**Prof Patrick Brennan,**Diagnostic Imaging, Faculty of Medicine and Health



### CruxML

JProf Philip Leong and Dr Barry Flower, School of Electrical and Informational Engineering



#### ResusRight

Matt Crott and Matt Boustred, PhD Students, Engineering



#### **BioScout**

Lewis Collins, PhD Student, Engineering



#### **OurFutures**

Prof Maree Teeson and Prof Nicola Newton, Matilda Centre ENIGMA2

## Enigma2

Dr Mike Seymour, Business School

"The Sydney Knowledge Hub has been working with the full gamut of staff that support our research entrepreneurs to ensure that we provide the right support for our startups. Its Researcher Entrepreneur Experience project highlighted some of the pain points, and has led to a number of new initiatives, including a mentoring project that connects experienced campaigners with budding entrepreneurs from our research."



Prof Julie Cairney
Pro Vice-Chancellor Research (Enterprise)



## **Program Of Events**

Researchers often have little exposure to the commercialisation process. With more of an understanding of what it takes to pursue market-driven research activities and funding, the Sydney Knowledge Hub aims to increase the number of researchers considering entrepreneurial industry initiatives. Through events, information sessions, and round tables, nearly 500 people attended over a dozen events on research commercialisation and entrepreneurship this year. Event topics included:

- Physical Sciences Fund Information Session
- But Who's Going to Pay for It? with Jim Rabeau
- What is a TRL Really?
- What is a Company, and How Do I Set One Up?
- What is a Scientific Advisor for a Startup? with Stephen Bartlett
- What is a MedTech Proof of Concept and how do I design one? with Tiller Design and ResusRight
- Navigating Commercialisation with the Faculty of Medicine and Health and the commercialisation team.

"Thank you for everything you do for University of Sydney and our young researchers to bring their ambitious to reality."



**Prof Fariba Dehghani** School of Chemical and Biomolecular Engineering





## **Inventor Mentor Program**

Researchers often have limited external networks and limited time to learn about bringing their invention to market. In August, we started a seven-month competitive pilot mentoring program to help 12 promising researchers work on their commercialisation strategy and overcome these common limitations.

Our 12 well-connected, generous mentors include:



Claire Birch Blackbird Ventures



**David Cardoso** NuroFlux



**Duncan Mcinnis** MTP Connect



Harikesh Pushpapathan Stoic VC



Joanna Ng Investible



John Keith Chair at Atomo Diagnostics



John Wood NOAB Ventures, Gelion



Melissa Mail Uniseed



**Mike Nicholls** Main Sequence Ventures



**Mobin Nomvar** Scimita Ventures



Qiao Qaio Knowledge Commercialisation Australasia



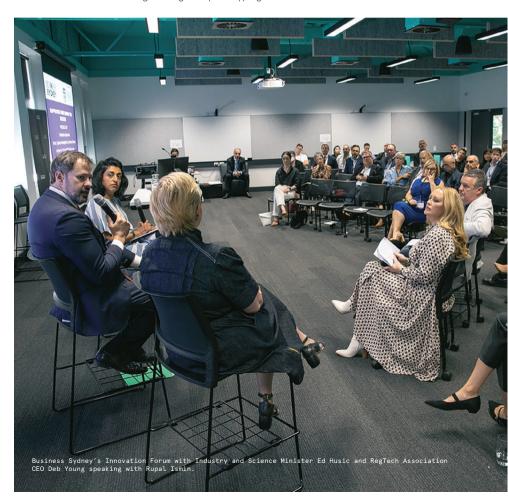
Vanouhi Nazarian **Accelerating Commercialisation** 

## The Space

The Sydney Knowledge Hub, located in the Merewether Building on the Darlington Campus, is the space where both planned and serendipitous interactions take place. Our members value peer-to-peer learning opportunities from other commercially-oriented scientists and entrepreneurs. The space is a vibrant environment for partners inside and outside the University to host industry engagement workshops, innovation events and collaborative meetings.

## The Hub includes:

- Open workspace for community and peer-to-peer learning
- Collaboration spaces for ideation and strategy
- Event spaces for showcasing, networking, and capacity building events
- Hardware Lab for building, testing, and prototyping





## The Hardware Lab

In August, we opened the doors to the Hardware Lab, a space for members and researchers to design, build and test proof of concept and products. Fitted with a range of equipment including an electronic testing station, 3D printers, laser cutter, CNC router and workshop tools, the Hardware Lab is designed to be a makers space for our members to iterate and test their designs in a safe, professional and collaborative environment.

Since opening, our current Hardware Lab residents include ResusRight, Archer Materials, BrainConnect, CruxML and Equinox Medical.

The Hardware Lab was made possible by the generous bequest from Pamela Winifred Green.

"This year has been a special one for Archer's biochip project. Our team of researchers worked together to create an automated biosensor testing setup in the newly opened Hardware Lab, while the Sydney Manufacturing Hub provided us with facilities to iterate custom 3D-printed devices. This combination of resources allows us to rapidly test and debug our design. We also use the Sydney University Research Prototype Foundry (RPF) to fabricate a wettable gFET, the technology at the heart of our biochip device. This collaborative effort enables us to take advantage of state-of-the-art facilities and develop innovative solutions quickly."

**Dr Rhea Cornely** Team Leader Biotechnology, Archer Materials

## **Student Innovation Experiences**

Entrepreneurial students are exposed to the member organisations, researchers, and network of the Sydney Knowledge Hub. This year we:

- Supported Prof Guy Ford, Director of the MBA Program, to run workshops with MBA students to help three researchers considering commercialisation.
- Sponsored Medivate, the four-day innovation challenge led by the Sydney University Society of Medical Innovation with real-life challenges provided by member organisation. Equinox Medical.
- Produced panel sessions for the Executive MBA cohort, led by Prof Clinton Free, on research commercialisation
- Hosted the Industry and Community Project Units final pitches.
- Hosted Assoc Prof Maryanne Large's Inventing the Futures final pitch day.

## **Supporting Student Startups across the** Innovation Network

Students who have accessed other University entrepreneurial programs across disciplines are supported by the Sydney Knowledge Hub. This we did this through:

- Seed funding for INCUBATE research-led participants
- Pro bono memberships for relevant graduates of INCUBATE and Genesis
- Hosting Genesis mentor meetings, run by Genesis lead James Crowther
- Mentoring through Enactus, an entrepreneurship club supporting students to make social change through startups
- Hosted the annual Sydney Innovation Festival with The Innovation Hub

Members have provided internship opportunities for students at the University

"We've seen a growing number of researchers engaging with entrepreneurial support. Together, INCUBATE and the Sydney Knowledge Hub support the full journey for researchers creating a new venture - from understanding your customer right through to scaling your business globally."



**David Smith** Program Manager. **INCUBATE** 



## Student-led Innovation in Healthcare

In September, member organisation Equinox Medical partnered with the Sydney University Society of Medical Innovation (SUSMI) on their 3-day Medivate Hackathon to give students the opportunity to contribute to the innovation of medical technology and healthcare.

Equinox provided relevant background information to four problem statements that required students solve a contemporary healthcare problem. As mentors, the Equinox team provided guidance to students across 12 mentoring sessions and a workshop presentation.

At the end of the three days, the teams pitched their solutions to Equinox Executives and industry experts at the Sydney Innovation Festival, where their problem statement, solution details, financial feasibility and ethics were considered in selecting a winner. Congratulations to the winning teams, Liquid Bio and ProbAlota, on their innovative solutions involving genomic sequencing.

Together, Equinox and SUSMI enabled students to go from ideation to presenting innovative solutions with the potential to change the world. Moreover, participants made new friends and networked with industry leaders, while gaining a greater experience and appreciation for medical innovation.

Learn more at <u>susmiusyd.org/medivate</u> and <u>equinoxmedicalgroup.com</u>





## **Doing Good**

Many of our members are striving to build a better functioning world across various sectors. Here are a couple of ways they are doing good.

Bush Heritage launched their 2030 strategy to protect 30 million hectares of land in the next decade by doubling their impact to deliver a 'healthy Country, protected forever' for the benefit of people, culture and biodiversity.

In response to the earthquakes that devastated communities in Tonga in January this year, **Equinox Medical** donated 5,000 Level 3 Surgical Gowns and 3,000 Protective Suits to support the emergency response effort.

Following the unprecedented level of rain that flooded Queensland and Northern NSW, Equinox partnered with Lismore City Council and Resilient Lismore by donating PPE to support the disaster recovery and clean-up effort.

