

# EMBL Australia Partner Laboratory Network

## 2018 Highlights



EMBL  
Australia



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# About EMBL Australia



EMBL Australia is a life science network that supports ambitious research projects and provides access to infrastructure and training to early-career Australian scientists.

Australia is an associate member of the [European Molecular Biology Laboratory \(EMBL\)](#) – Europe’s flagship life sciences institution.

The associate membership gives Australia the opportunity to internationalise our life sciences research, introduce the world’s best young researchers to new networks and tools here in Australia, and develop highly competitive research teams networked across the nation, with Europe and Asia.

Supported by the [National Research Infrastructure for Australia \(NCRIS\)](#) program, an Australian Government initiative, EMBL Australia is at the cutting edge of life sciences research in Australia.

EMBL Australia has:

- a **Partner Laboratory Network** (PLN) consisting of 15 research groups led by outstanding early-

career researchers at nodes in Victoria, South Australia, New South Wales, Queensland and the ACT

- a nationwide reach through **student training programs**, including a PhD course, postgraduate symposium, travel grants and PhD program
- a national resource and a PhD program, **EMBL Australia Bioinformatics Resource** (EMBL-ABR), that provides bioinformatics support to Australian life science researchers
- access to international linkages through EMBL and the European Bioinformatics Institute (EMBL-EBI).

Australia became the first associate member of the EMBL in early 2008. Launched in 2010, the [EMBL Australia PLN](#) set out to take full advantage of this unique affiliation, with the goal of strengthening the

nation’s global position in life sciences research.

The EMBL Australia PLN is hosted at the South Australian Health and Medical Research Institute, University of New South Wales, Australian National University, Garvan Institute of Medical Research, QIMR Berghofer Medical Research Institute and Monash University. The EMBL Australia Secretariat is hosted by the [Monash Biomedicine Discovery Institute \(BDI\)](#).

The [EMBL Australia Council](#) oversees and guides the activities of EMBL Australia, including both its Partner Laboratory Network and its Bioinformatics Resource (EMBL-ABR). The Partner Laboratory Network also has a Steering Committee, which is composed of senior representatives of each institution that form part of the network and is chaired by EMBL Australia’s Scientific Head, [Professor James Whisstock](#).

# Research Groups



In 2018, EMBL Australia consisted of 15 research groups at six institutes across Australia.

With the freedom to drive their own ambitious research projects, EMBL Australia group leaders are exceptional and innovative researchers who apply novel approaches and techniques to complex scientific problems. They ask challenging research questions and publish in high-impact journals.



## \$15.8M

External funding grants\*



## 15

Group leaders



## 06

Research institutions



## 62

Researchers



## 25

Students (PhD, Master & Hons)

\*Includes both individual and collaborating grants.

# Partner Laboratory Network

## Brisbane



**Michelle Boyle**  
Malaria mechanisms

## Adelaide



**David Lynn**  
Immunity  
and genomics



**Ville-Petteri Mäkinen**  
Systems epidemiology



**Pirjo Apaja**  
Organelles  
and trafficking

## Melbourne



**Prof James Whisstock**  
Scientific Head



**Max Cryle**  
Antibiotics and  
bacterial infections



**Chen Davidovich**  
Chromatin biology



**Edwina McGlenn**  
Skeletal development



**Mikaël Martino**  
Bone regeneration



**Harald Janovjak**  
Synthetic biology

## Sydney



**Yann Gambin**  
Single molecule science



**Maté Biro**  
Immune response



**Richard Morris**  
Systems theory

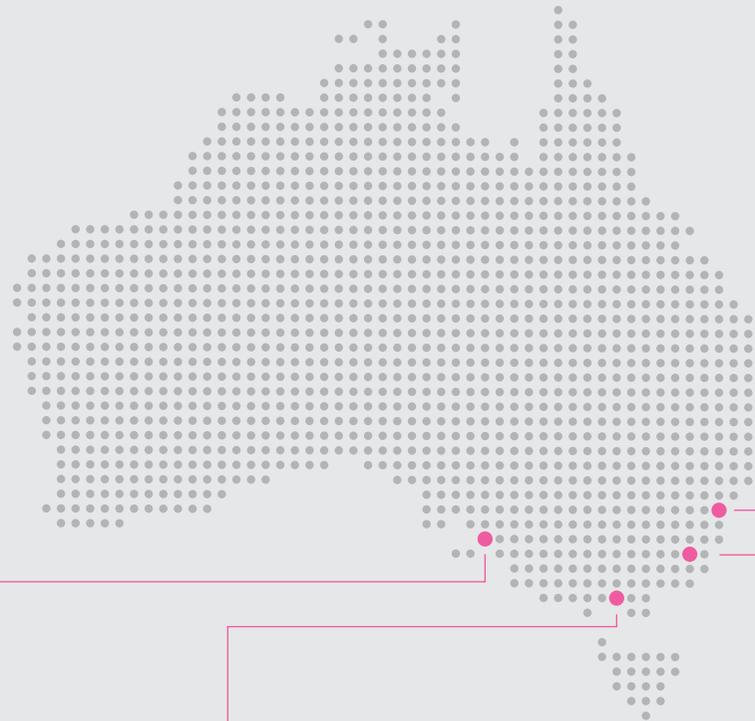


**Robert Weatheritt**  
RNA biology

## Canberra



**Barry Thompson**  
Epithelial biology



# Research Excellence Snapshot

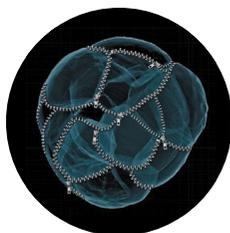


## 72

Publications in 2018, including journal articles, reports, reviews, letters and book chapters.



View all publications:  
[Publications 2018](#)



An artist's impression of how an early embryo is sealed up with coordinated zippering at the cellular junctions triggered by the coupling of neighbouring actin rings.

**Credit:** Melanie White/A\*STAR, Singapore

### Expanding rings vital for viable embryos

Dr Maté Biro and EMBL Australia's first alumnus, Dr Nicolas Plachta of A\*STAR in Singapore, discovered a process during mammalian embryonic development that is critical for early embryos to develop into healthy blastocysts. The findings were published in the journal [Cell](#).

### Collaboration to build a novel computational platform

Dr Biro began work in collaboration with researchers from the University of Sydney, University of Waterloo, and the University of York (UK) and King's College London to develop a novel computational platform, enabling the quantitative prediction of the optimal search strategy to be adopted by populations of agents searching for scarce targets in any given environment.

### Can early antibiotic use make vaccination less effective?

A/Prof David Lynn and his team at the South Australian Health and Medical Research Institute (SAHMRI) and Flinders University found that, in preclinical models, antibiotic exposure in infants impairs their responses to five important, routine vaccines that are administered daily around the world, including vaccines against meningitis, pneumonia, tuberculosis and whooping cough.

A/Prof Lynn said that these findings are very important because by one year of age, 50 percent of infants in Australia will be exposed to antibiotics, and this is the period of life that many of these vaccines are administered. The research was published in [Cell Host & Microbe](#).

### Unlocking clues to the cause of Alzheimer's disease

Dr Ville-Petteri Mäkinen, together with a team of researchers at SAHMRI, revealed a genetic link between Alzheimer's and the endo-lysosomal system, a critical part of biological recycling machinery that maintains the health of brain cells. Dr Mäkinen says the endo-lysosomal system acts like a garbage disposal service, removing and recycling damaged material within cells.

The research is an important step in understanding how dysfunction in the brain's recycling machinery may cause Alzheimer's disease, and could help to unlock new drug targets, or treatment strategies. The findings were published in the journal [Brain](#).

The research was featured in the media in an [ABC Radio National Health Report](#), [The Lead](#) and also in South Australia's [10 News First](#).

# Research Excellence Snapshot (continued)



## Guest editor in prestigious journal

A/Prof Max Cryle was invited to write an article for *Nature Product Reports*. He was the guest editor as part of the themed collection: 'Understanding biosynthetic protein-protein interactions.'

## New gene splicing method developed

Dr Robert Weatheritt and his team developed a new technique called Whippet. Whippet is a new method for the rapid and accurate profiling of alternative gene splicing. It is an easy-to-use RNA-seq analysis method with hardware requirements compatible with a laptop. The method was published in *Molecular Cell* and Dr Weatheritt was (co-) first author.

## Grant success for group leaders

A/Prof Chen Davidovich was awarded the sole Chief Investigator on a NHMRC Project Grant to study gene regulation. Later in the year, he was also awarded an ARC Discovery Project Grant to understand the development processes of multicellular organisms, by determining the mechanism that underpins the recruitment and regulation of PcG proteins by polycomb-like proteins.

Following an Australian delegation visit to EMBL in Heidelberg, A/Prof Chen Davidovich and Kyung-Min Noh from EMBL, Heidelberg, were awarded a collaborative grant to study how genes are regulated

at the molecular level. The new study will determine how chemical modifications in histone proteins control gene expression during normal development or in disease.

A/Prof Max Cryle received an ARC Discovery Project Grant to further his research in developing new antibiotics. The grant uncovers the reengineering potential of the biosynthetic machinery that produces glycopeptide antibiotics.

A/Prof Mikaël Martino was awarded an NHMRC Project Grant to support him in engineering the second generation of growth factors and cytokines for regenerative medicine applications.

Dr Harald Janovjak was awarded a JDRF project grant for innovative work exploring light as a new strategy to treat type 1 diabetes.

Dr Qi Zhang, a postdoctoral fellow in the Davidovich Group, received an Australian Research Council Discovery Early Career Researcher Award (DECRA) for her research investigating molecular mechanisms for the regulation of Polycomb repressive complex 2.

## New Group Leaders



### Dr Harald Janovjak

Harald commenced in January and established his lab at the Australian Regenerative Medicine Institute (ARMI), Monash University.

**Conducting research at the interface of synthetic biology and mammalian physiology.**



[Read more about Dr Harald Janovjak](#)



### Dr Robert Weatheritt

Robert commenced in June and established his lab at the Garvan Institute of Medical Research in Sydney.

**Aiming to uncover the root causes of neurodevelopmental disorders and to develop therapeutic interventions.**



[Read more about Dr Robert Weatheritt](#)



### Dr Michelle Boyle

Michelle commenced in November and established her lab at the QIMR Berghofer Medical Research Institute in Brisbane, Queensland.

**Developing effective malaria vaccines.**



[Read more about Dr Michelle Boyle](#)



### Dr Richard Morris

Richard commenced in December and established his lab at the University of New South Wales (Single Molecule Science).

**Applying and developing concepts from statistical and theoretical soft-condensed matter physics, as well as applied mathematics, to describe biological systems.**



[Read more about Dr Richard Morris](#)

## Awards And Achievements



**Australian  
Research Council  
Australian  
Laureate  
Fellowship**

**Prof  
James Whisstock**

Scientific Head Professor James Whisstock was awarded an Australian Research Council Australian Laureate Fellowship. Prof Whisstock is developing *in situ* structural biology approaches to permit direct visualisation of macromolecular protein structures in the context of the cellular environment. He will study embryonic patterning in the fruit fly, *Drosophila Melanogaster*.



**Khwarizmi  
International  
Award**

**Prof  
Katharina Gaus**

NSW Node Head Prof Katharina Gaus received the Khwarizmi International Award for her achievements in single-molecule imaging. She was one of five foreign laureates named by the Iranian Research Organization for Science and Technology and was presented with the award at a ceremony in Tehran.



**Australian  
Bioinformatics &  
Computational  
Biology Society  
Mid-Career  
Researcher  
Award**

**A/Prof David Lynn**

A/Prof David Lynn was awarded the Australian Bioinformatics and Computational Biology Society Mid-Career Researcher Award.

## New Host Institute



**Australian  
National  
University**



**The PLN welcomed the ACT's first host institute, the John Curtin Institute of Medical Research at the Australian National University.**

Chief Scientist Dr Alan Finkel, EMBL Director General Prof Iain Mattaj and Prof James Whisstock attended a launch event, which was compered by ANU Vice-Chancellor and Nobel Laureate Professor Brian Schmidt.

EMBL Australia is looking forward to working with ANU to recruit new group leaders in 2019.



Dr Silke Schumacher, Director General Prof Iain Mattaj, Dr Alan Finkel and Prof James Whisstock tour facilities at ANU.



Dr Alan Finkel presents at the launch.

# Strengthening International Linkages



EMBL Australia researchers visited EMBL Heidelberg for a three-day program that included initiating research collaborations and touring facilities.



**EMBL Australia Group Leaders with EMBL Director General Iain Mattaj**

It was an opportunity to further internationalise EMBL Australia's life sciences research, and discuss research pathways and future research between European and Australian scientists.

—  
 “The visit enabled the exploration of areas of overlap with new EMBL group leaders that will hopefully create opportunities for future collaborations,” said group leader Dr Robert Weatheritt.  
 —

Director General Iain Mattaj also visited Australia's Partner Laboratory Network laboratories. He spent time with group leaders discussing their research. Prof Mattaj gave an inspiring talk to the Melbourne science community at a public lecture at Deakin Edge, Federation Square. He shared how EMBL's unique model, which gives young scientists the freedom to be ambitious, has led to ground-breaking scientific discoveries.

Prof Mattaj highlighted that Australia is a collaborative country and he sees many opportunities in the future between European nations and Australia.



—  
 “Research is a completely global enterprise... the only scale is the world. The only way to do ambitious things is to collaborate. I see Australia as being a very good partner because that mindset exists here,” said DG Mattaj.  
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## International cryo-EM training

EMBL Australia is a major sponsor of the cryogenic electron microscopy (cryo-EM) course at Monash University's Prato Centre in Italy. The course is for PhD students and researchers who are performing cryo-EM, and gives them the skills and knowledge to take their projects to the next level. Last year, the workshop trained 42 researchers and 12 instructors from Australia, Europe, US, South America, India, Singapore and China.

## Student Programs



To identify and develop future scientific leaders, EMBL Australia attracts Australia's best students by offering a number of highly sought-after programs.



30

Student travel grants awarded



139

Applicants for 2018 PhD Course



140

PhD students attended EAPS



77

Scientists presented to students at EMBL Australia programs

# Student Programs (continued)



## The 5th EMBL Australia PhD Course

1–13 July 2018, University of New South Wales, Sydney

**Modelled on EMBL's predoc course, the two-week annual program offers sixty 1st or 2nd-year PhD students symposium-style presentations and workshops from Australian and international speakers.**

Sixty PhD students were selected from across Australia to attend the two-week EMBL Australia PhD Course, which exposed them to the latest research, from structural biology to animal models, developmental biology to bioinformatics, advanced microscopy to plant biology. The reputation of the course is increasing, with a record number of students applying for one of the 60 places this year.

The course includes research presentations from renowned Australian and international scientists, specialised workshops, tours of local facilities, career insights, panel discussions and networking opportunities.



## Partnership PhD Program

**EMBL Australia group leaders offer scholarships to outstanding students, who receive additional career, research and monetary support during their doctoral studies.**

Alexandra-Madelaine Tichy, a recipient of an EMBL Australia Partnership PhD Scholarship, receives additional career, research and monetary support during her PhD placement at EMBL Australia's [Janovjak Laboratory](#).

Her position as an EMBL Australia PhD Student gives her the opportunity to network and collaborate with other EMBL Australia lab members, and also with other group leaders.

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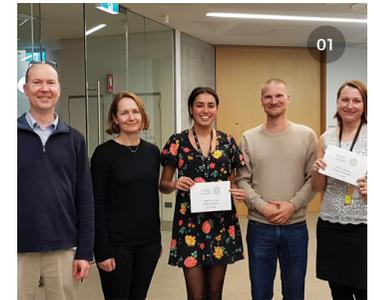
**“Through the scholarship, I've developed great connections within EMBL Australia and the wider research community. This has been particularly helpful for me living and working in a new country,” said Alexandra.**

—

EMBL Australia's Partnership PhD Program attracts high-quality international students to EMBL Australia groups and develops students into future scientific leaders. Scholarship placement students have access to exceptional scientific mentorship and the wider EMBL Australia research community. They also receive an additional \$5,000 per year, have the opportunity to attend the PhD Symposium at EMBL Heidelberg and can apply for further travel grants to visit international EMBL workshops or conferences.



Alexandra-Madelaine Tichy



**01** Winners of the PhD Course Poster Session — Yasmin Alshoulbaki and Hana Starobova and with judge, Dr Ville-Petteri Mäkäinen

**02** Through a highly competitive process, 60 of Australia's top PhD students were selected to participate

# Student Programs (continued)



## Travel grants

**Supporting PhD students to take a short course, attend a conference or work collaboratively alongside some of the world's best researchers at EMBL's facilities in Germany, Italy, France, Spain or the UK.**

Twenty Australian PhD students had the opportunity to train at one of EMBL's six European facilities, go to a conference or take a short course.

EMBL Australia travel grants sponsored some of Australia's top students to go overseas and to learn and work with some of the world's best young researchers.

The \$2000 grants gave students a chance to attend the 20th EMBL PhD Symposium in Heidelberg, Germany. Other students had the opportunity to work with EMBL researchers at EMBL Heidelberg (Germany), EMBL Hamburg (Germany), EMBL Grenoble (France), EMBL-EBI Hinxton (UK), EMBL Rome (Italy) or EMBL Barcelona (Spain).

PhD student Simon Hardwick, from the Garvan Institute, received an EMBL Australia travel grant to attend the EMBL Non-Coding Symposium

in Heidelberg. He discussed his work with young researchers with a view to future collaborations, met laboratory heads and editors of several leading scientific journals. He is pictured with *Nature Reviews Genetics* chief editor Dr Linda Koch, who hand-delivered him a hardcopy of the recent journal issue in which he'd had a review article published.



Simon Hardwick with Dr Linda Koch,  
Chief Editor of *Nature Reviews Genetics*



## 2018 EMBL Australia Postgraduate Symposium (EAPS) – Translational Research

**An annual student-developed symposium for honours, masters and PhD students provides an opportunity for students to learn from world-leading researchers, network and present their work.**

EAPS, EMBL Australia's annual student-led and developed symposium, was held at the Translational Research Institute (TRI) in Brisbane in November.

More than 140 students from across Australia attended the three-day program. Prominent scientists delivered inspiring

presentations, including keynote speaker Professor Ian Frazer, who discussed the creation of the HPV vaccine and key factors in building a successful career.

EAPS is also an opportunity for students to network with other like-minded students.



01 Prof. Ian Frazer delivered the Keynote Address  
Pictured here with Jasmina Markulic, EAPS 2018 Convener



02 Science & Society Panel (from left to right): A/Prof. Cedric Bardy, Dr. Lynn Fink, Prof. Josephine Forbes, A/Prof. Tracy Ainsworth and A/Prof. Lutz Krause



03 An opportunity to meet and build connections with other students.

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Our quarterly newsletter: [Subscribe here](#)

Online: [emblaustralia.org](http://emblaustralia.org)



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EMBL Australia is supported by:



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