

# EMBL Australia Annual Report

March 2012 – February 2013





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# Annual Report of the Chair of EMBL Australia Council



## **2012 has been a busy and important year for EMBL Australia.**

As required by the then Department of Innovation, Industry, Science, Research and Tertiary Education, a review was conducted of the progress made by EMBL Australia since Australia was accepted as the first Associate Member of EMBL in 2008.

We are grateful to Dr Adi Paterson and the international panel for their thorough review. Overall, the findings of the review were very positive, indicating the considerable progress that has been made in a short period of time, and particularly praising the quality of the initial two group leaders and their science.

The recruitment of Graham Cameron, from the European Bioinformatics Institute of EMBL, as the Director of the renamed Bioinformatics Resource Australia EMBL (BRAEMBL) at the University of Queensland has led to a reformulation of the role of this much needed resource. The Bioinformatics Resource will play a vital role underpinning life sciences research in Australia by being a bioinformatics data repository, training centre and centre for methodological development. Graham will work closely with Dr David Lovell from CSIRO, who has been appointed the Director of the Australian Bioinformatics Network—an initiative of EMBL Australia in partnership with Bioplatforms Australia and CSIRO.

The PhD training program has progressed with the launch of two student programs providing opportunities for Australian PhD students to attend EMBL for conferences and training programs. Plans are well advanced for the first PhD course to be mounted by EMBL Australia with input from EMBL. It will be a two-week residential school for 60 PhD students and will be conducted at the Walter and Eliza Hall Institute of Medical Research in Melbourne.

The value of the EMBL Australia membership has been demonstrated by the decision of the newly established South Australian Health and Medical Research Institute (SAHMRI) to fund three EMBL Australia group leader

positions to head its bioinformatics program. SAHMRI is an initiative of the South Australian Government, Flinders University and the Universities of Adelaide and South Australia. The recruitment and appointment of these group leaders will follow the EMBL process.

The pleasing progress of EMBL Australia has been driven by its Executive Director, Mr Silvio Tiziani, its Scientific Head, Prof Nadia Rosenthal, their staff and the Council of EMBL Australia.

I thank and congratulate everyone involved for their efforts and the Australian Government, the member universities and CSIRO for their support.

A handwritten signature in black ink that reads "Richard G. Larkins". The signature is written in a cursive, flowing style.

**Richard G. Larkins AO**  
**Chair, EMBL Australia Council**

# Annual Report of the Scientific Head



## **I am proud to report on EMBL Australia's growth over the past year.**

This time last year EMBL Australia had two Australian research groups at our Victorian node, one research group at EMBL in Heidelberg, and a new initiative—the Bioinformatics Resource Australia of EMBL Australia (BRAEMBL)—based at our Queensland node.

Now, as 2013 unfolds, we are expanding into a South Australian node with three EMBL Australia research groups to be based at the soon to be completed South Australian Health and Medical Research Institute (SAHMRI) in Adelaide; we've added two new initiatives—the Australian Bioinformatics Network and SBI Australia, which is an offshoot of Japan's esteemed Systems Biology Institute—and we have a growing portfolio of student programs.

Our key focus to date has been to develop programs that support Australia's young researchers and give them a flying start as they pursue careers in the life sciences. As in many countries around the world, Australia's typical science funding model is to award short-term (three-year) grants, which are often not long enough for young researchers to establish themselves. EMBL Australia offers talented young scientists up to nine years of secure funding in state-of-the-art facilities, giving them the opportunity to take some risks and really prove themselves. It's a model that has proven successful at EMBL in Europe in attracting and retaining high calibre scientists.

Our first two Melbourne-based group leaders are now entering their second and third years at EMBL Australia and their hard work is starting to bear fruit in the form of publications and additional research grants. We were excited when SAHMRI approached us about establishing a new node in Adelaide, funded by the three main South Australian universities and the State Government, to underpin their biomedical informatics capabilities. It has given us confidence that we are on the right track to develop a new research paradigm across Australia.

At the other end of the career ladder, EMBL Australia is providing opportunities for PhD students to travel overseas to conferences and training courses at EMBL, exposing them to new ideas and technologies, and allowing them to begin building their own network of contacts, a valuable resource for their future.

The EMBL Australia PhD Course—a first for Australia—launches in July 2013 and will introduce 60 young scientists to the broad scope of life sciences. It's heavily modelled on EMBL's own pre-doctoral course, which is compulsory for all students undertaking doctoral studies there. We hope that qualified students from around Australia will come away full of ideas, with new contacts and new knowledge to give their research a flying start.

We have also focused on building up Australia's capabilities, through our unique collection of resources and alliances. I am delighted that Graham Cameron, formerly head of EMBL's European Bioinformatics Institute, has joined BRAEMBL as its Director. A recent survey conducted by Graham and his team found a rapidly growing need for bioinformatics in Australia, and a critical need for both training at all levels and access to expertise. Through BRAEMBL and its counterpart in outreach, the Australian Bioinformatics Network, we hope that the local bioinformatics community will flourish.

Our newest initiative is SBI Australia, the first international node of Japan's Systems Biology Institute. Both EMBL and EMBL Australia have had a long association with SBI Director Hiroaki Kitano, and we are looking forward to a long and fruitful association. Through this initiative and others we are showcasing Australia's life sciences research to the world.

Later this year, Australia's status as an Associate Member of EMBL will be considered for renewal by both the Australian Government and EMBL's Executive Council. We believe that EMBL Australia is proving its worth, and will continue to do so as it grows.

A handwritten signature in black ink, reading "N. Rosenthal". The signature is fluid and cursive.

**Prof Nadia Rosenthal**  
**Scientific Head, EMBL Australia**



# About EMBL Australia

**EMBL Australia is a joint venture between the Group of Eight universities and CSIRO, supported by the Australian Government's science infrastructure investments.**

EMBL Australia:

- links Australian researchers to international powerhouses of life science research
- gives early-career researchers secure, long-term research funding which enables them to take risks and ask big questions
- gives Australia's best PhD students the chance to develop international networks and alliances and 'calibrate' their work via EMBL's European programs, workshops and conferences
- provides training programs for PhD students in Australia—giving them a head start in their science careers
- creates and shares life science resources with the Australian life science community.



*The Victorian node at the Australian Regenerative Medicine Institute, Monash University.*



*The South Australian node will be hosted at the South Australian Health and Medical Research Institute.*

## About EMBL (the European Molecular Biology Laboratory)

EMBL is Europe's flagship for the life sciences. Its founders had a vision of a supranational research centre to redress the imbalance caused by US domination of molecular biology.

EMBL was founded in 1974 and is funded by contributions from its 20 European member states. Australia is the first and the only Associate Member.

With nodes in Hinxton (near Cambridge, UK), Grenoble (France), Heidelberg and Hamburg (Germany), and Monterotondo (near Rome, Italy), EMBL comprises about 85 independent research groups and more than 1,400 people from 60 nations.

Among its many features are:

- nine years of funding security for research leaders (subject to performance), after which they move on



*Heidelberg, Germany, is the site of EMBL headquarters.*

- training for young researchers—over 3,000 per year
- highly sought post-doctoral positions
- internationalising research networks across Europe and around the world
- a culture that focusses on young scientists and builds strong research alliances.

EMBL achieves goals beyond the reach of individual member states.



## Membership of EMBL

Australia joined EMBL as an Associate Member in 2008. Australia's Associate Member status runs until 2014.

Australia's membership is managed by the Commonwealth Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education.

EMBL Australia maximises the benefits of Australia's associate membership of EMBL via research support, infrastructure development and training opportunities across Australia.

## The EMBL Australia difference

EMBL Australia creates opportunities for:

- internationalising Australian research
- empowering and training our best early career researchers and research leaders
- embedding powerful new enabling tools, such as bioinformatics and systems biology, in Australian life science.

## Internationalising Australian research

EMBL Australia links Australian researchers to three international powerhouses of life science research:

- EMBL—which jointly supervises Australian PhD candidates (through the International PhD Program) and hosts early-career scientists (through the Faculty Development Program). EMBL also invites Australian PhD students to visit for symposia or study visits
- EBI (the European Bioinformatics Institute)—which shares terabytes of data with the Australian life science community through Bioinformatics Resource Australia of EMBL (BRAEMBL)
- Japan's Systems Biology Institute—which is now closely linked to Australian life science through the establishment of an Australian node, SBI Australia.

These connections enable EMBL Australia to create highly competitive research teams that are networked across the nation and with Europe and Asia.

## Empowering and training young researchers

EMBL Australia supports talented early-career scientists with research support, networking and training.

### *EMBL Australia Research Groups*

EMBL Australia's flagship program is its research program, which follows the EMBL model in providing talented young scientists with up to nine years of secure and generous funding. The scientists are embedded within existing research institutes and universities.

EMBL Australia plans to work with its members and others to create a total of 18 to 20 research groups around Australia—offering hosting institutions access to the scientific excellence and scientific governance that drives EMBL and EMBL Australia.

### *Supporting students with grants, internships and training*

EMBL Australia funds a number of travel grants for PhD students, which allow student travel for conferences and workshops and also to make visits to EMBL laboratories in Europe. Australian students also have the opportunity to apply to study for a PhD at EMBL.

EMBL Australia is developing training programs for PhD students as well as supporting industry internships. SBI Australia offers training to undergraduate and postgraduate students, and to post-doctoral researchers, in a wide range of disciplines. Also, the Australian Bioinformatics Network provides information, support and advanced training in bioinformatics.

## Embedding new enabling tools into Australian life science

EMBL Australia is committed to creating and sharing life science resources with the Australian life science community.

EMBL Australia's initiatives include the Bioinformatics Resource Australia of EMBL (BRAEMBL), which provides access to EMBL's European Bioinformatics Institute (EBI) databases and services.

The Australian Bioinformatics Network is developing into a community of bioinformaticians and users of bioinformatics resources across Australia.

SBI Australia will promote transnational systems biology research through the sharing of scientific technology, resources and expertise.

EMBL Australia also supports life science research by undertaking joint activities and sharing resources and expertise with a number of affiliate organisations.

### EMBL Australia's core program

EMBL Australia's core program consists of the following research nodes, initiatives and activities:

- Dr Edwina McGlinn and her team, within ARMI (the Australian Regenerative Medicine Institute) at the Victorian node at Monash University, are working to understand skeleton formation—how do cells in a limb bud know, for example, whether to form fingers or an upper arm bone?
- Dr Nicolas Plachta and his team, also at ARMI at the Victorian node at Monash University, can track the movement of proteins as they turn genes on and off inside living cells—revealing how individual cells in an embryo change as they turn into specialised cells such as bone, nerves or skin.
- The NSW node at the University of Sydney comprises a single research group, headed by Dr Marcus Heisler. Marcus is currently based at EMBL in Heidelberg through the Faculty Development Program, supported by the University of Sydney and the Australia Research Council, and is due to return to Australia in 2015 or 2016. There are plans for two further research groups.
- The South Australian node comprises three research groups being created at SAHMRI (the new South Australian Health and Medical Research Institute, which is a collaboration between Flinders University and the Universities of Adelaide and South Australia) focussing on biomedical informatics. These three groups are expected to be established in late 2013–2014.
- A node will be developed at UWA as funds and opportunities arise.
- The Queensland node hosts the Bioinformatics Resource Australia (BRAEMBL) at the Institute of Molecular Biosciences at the University of Queensland. It provides access to international and Australian life science data enabling Australian researchers to access more data faster. In addition, a research group is likely to be co-located with the Bioinformatics Resource at the University of Queensland, subject to funding arrangements.
- The Australian Bioinformatics Network is helping Australian scientists learn how to work smarter with bioinformatics, and helping Australian bioinformaticians share information and ideas. It supports a wide range of activities across Australia. It is based at CSIRO in Canberra and funded by EMBL Australia, CSIRO and Bioplatforms Australia.
- SBI Australia, an initiative based at Monash University, is introducing systems biology to Australian researchers via direct research, training and communication. It enables life scientists to harness computing technology and engineering methods to simulate complex life systems—the heart, the immune system, and whole organisms.
- The EMBL Australia student programs provide training that gives students a head start in their science careers. Highlights include:
  - PhD travel grants for travel to Europe to study, train and network at EMBL's labs in Germany, Italy, France and the UK
  - the annual PhD school—a two-week intensive course
  - opportunities for joint PhDs with EMBL
  - support for bioinformatics internships.



*Hiroaki Kitano (SBI) and Richard Larkins (EMBL Australia) after signing the agreement to form SBI Australia.*



# 2012 Highlights

In 2012 EMBL Australia:

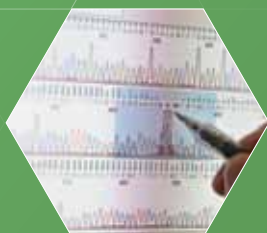
- Launched two student programs to send PhD students to EMBL for conferences and training programs
- Launched the EMBL Australia alumni group for former EMBL and EMBL Australia students and staff
- Established the Australian Bioinformatics Network, as a joint program with CSIRO and Bioplatforms Australia
- Appointed Dr David Lovell as Director of the Australian Bioinformatics Network
- Appointed Mr Graham Cameron as the Director of Bioinformatics Resource Australia (BRAEMBL—formerly known as the EMBL Australia Mirror of the EMBL-EBI)
- Appointed Prof Peter Currie as the Head of EMBL Australia's Victorian node
- Supported Simone Li to study at EMBL's pre-doctoral program—she is the first Australian student to study at EMBL through the International PhD Program
- Undertook a Mid-term Review of EMBL Australia and Australia's status as an Associate Member of EMBL
- Agreed to host the Australian node of Japan's Systems Biology Institute, SBI Australia, at EMBL Australia's Victorian node, based at the Australian Regenerative Medicine Institute at Monash University
- Established the South Australian node at SAHMRI and commenced recruitment for group leaders
- Developed and launched the EMBL Australia PhD Course, a two-week residential program for first and second year PhD students
- Via the Bioinformatics Resource Australia, surveyed bioinformatics users around Australia to assess scientific needs and concerns
- Developed and implemented a communications strategy to spread the word about EMBL Australia, including monthly newsletters to interested stakeholders.



# 2013 Outlook

During 2013 EMBL Australia will:

- Recruit up to three new group leaders for the new node at SAHMRI
- Review and develop the EMBL Australia governance model and develop guidelines for establishment of new groups and nodes
- Establish a senior leadership team to oversee the further growth of EMBL Australia
- Further develop the alumni group and hold events around Australia
- Review services and operations at BRAEMBL, and develop a clear strategy for the future of the Resource
- Pursue relationships between BRAEMBL and related Australian projects to mutually enhance capabilities
- Consolidate the role of the Australian Bioinformatics Network in the Australian bioinformatics landscape
- Increase the number of networking, training and education events through the Australian Bioinformatics Network
- Continue to progress the student grant programs to facilitate greater student exchange
- Continue to develop and then run the first PhD Course in July 2013
- Examine the viability of an EMBL Australia PhD program
- Build on the current communications strategy and expand it to encompass all of EMBL Australia's nodes and initiatives
- Develop SBI Australia as a critical resource for EMBL Australia
- Continue to lead planning and promotion for the 15th International Conference on Systems Biology (ICSB 2014), to be held in Melbourne from 13–19 September, 2014.



# Key activities

Each of the activities underway in EMBL Australia's core program is described in more detail below.

## McGlinn Research Group—how does a skeleton grow?

Edwina (Eddy) McGlinn and her team at EMBL Australia's Victorian Node are investigating the genetics underlying the development of the skeleton— how the correct pattern of bones form in the vertebral column or the developing limb of vertebrate embryos.

They are concentrating on the role played by particular microRNA genes (the miR-196 family) which regulate the expression of Hox genes. These genes are known to play a critical role in vertebral column formation and limb development and patterning. Eddy is pioneering a novel approach, using knockout mice and knockdown techniques: in knockout mice, specific microRNA genes are inactivated; knockdown techniques are used to reduce the expression of targeted microRNAs in chick and mouse embryos.

Ultimately, the group aims to build a more comprehensive molecular road-map of how the size, shape and number of bones form within the early vertebrate embryo. This knowledge will contribute to the basic understanding of developmental processes, which in turn may assist in the treatment of a number of diseases—for example, it's possible that similar processes are important in some forms of leukaemia—as well as underpin applications in regenerative medicine.

In October 2012, Eddy McGlinn was awarded a National Health and Medical Research Council (NHMRC) Project Grant of just over \$500,000 to elucidate the role of miR-196, a microRNA molecule that regulates the expression of the Hox family of transcription factors, in the formation of the axial skeleton.

### Project 1. The role of miR-196 in defining vertebral number and identity

The miR-196 family of microRNAs have been identified as critical regulators of the processes determining the number and identity of vertebrae. Using mice in which each of the three miR-196 genes has been knocked out and replaced with a marker protein, the McGlinn group has made the novel discovery that miR-196 specifically regulates the number of thoracic vertebrae. They are now investigating the molecular changes underlying this morphological defect as well as the cellular processes underlying the gain or loss of vertebrae during development.



McGlinn Group members (L to R) Back: Eamon Coughlan, Jesus Casanova, Lisa Wong and Ismath Elias. Front: Alysha Heimberg, Cristina Massa Gomez and Eddy McGlinn.

### Project 2. The evolution of Hox-embedded microRNAs

Hox genes encode transcription factors that play a key role in regulating the body plan during development. Unique Hox gene signatures are found in divergent animal species, and this probably represents a central mechanism underlying morphological diversity. In addition, acquisition of microRNA regulation specific to particular cell lineages may be a fundamental mechanism that stabilises Hox gene expression and enables the evolution of novel morphologies. McGlinn's team is investigating the importance of miRNA regulation in several species that represent important evolutionary branch points— the polychaete worm *Capitella telata*, a protostome, and Amphioxus, a basal chordate—as well as in species with particularly striking morphological innovations such as the snake, which has an elongated vertebral column.





## Key activities

### Plachta Research Group—what controls gene expression?

Dr Nicolas Plachta and his team at EMBL's Victorian node are pioneering techniques that let them actually see the proteins that control gene expression (known as transcription factors) as they move around the cells of living mammalian embryos. Understanding these mechanisms is critical to understanding human biology and disease.

Using imaging technologies developed to study molecular and cellular events during embryonic development in mammals, Nicolas and his team are zeroing in on how transcription factors move around the embryonic cell as it begins to differentiate into a more specialised cell lineage.

The team has developed techniques that allow them to see the movement of transcription factors inside the cell. By tagging the proteins with fluorescent dyes, the team can track their movement in real time within individual cells of intact embryos.

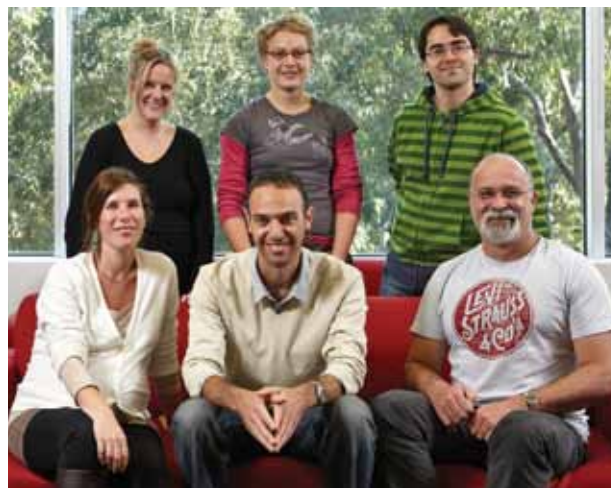
With the help of computational and mathematical modelling, Plachta's team are looking at how changes in the mobility of these proteins relate to cell differentiation events as the embryo develops. Ultimately this will lead to a better understanding of the processes that drive early embryo development and differentiation into different cell types.

It's an area of research that is likely to have wide application, not just for basic research into embryonic development but for reproductive medicine, regenerative medicine, and the differentiation of cells within adult cells and tissues.

In October 2012, Nicolas Plachta and his co-investigator Toby Bell, from Monash University, were awarded an NHMRC Project Grant of just over \$580,000 to investigate how transcription factors search the DNA to control pre-implantation development in mammals.

#### Project 1. Mobility of gene regulatory molecules in living embryos

The Plachta Group has shown that transcription factor mobility (also called kinetics) varies between different blastomeres, which are embryonic cells at a very early stage of development. The differences in kinetics can be used to predict the developmental fate of the cells. The team is now investigating the main molecular mechanisms controlling transcription factor kinetics.

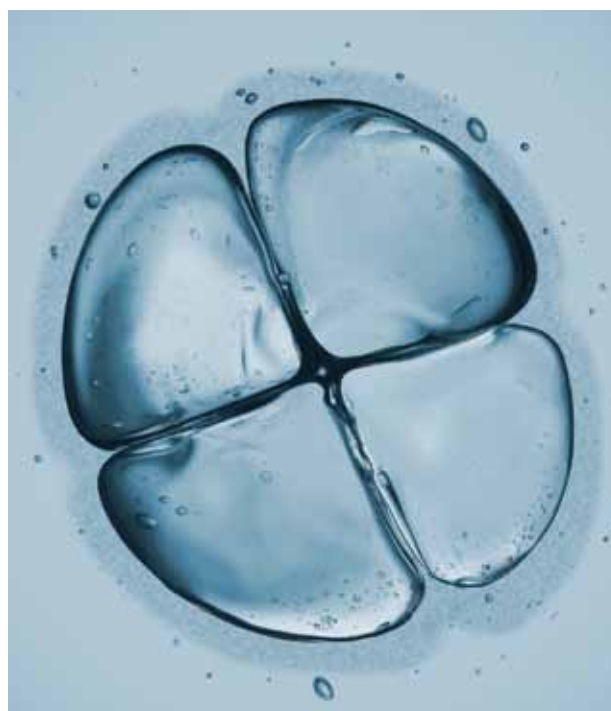


Plachta Group members (L to R) Back: Melanie White, Jennifer Zenker and Juan Gonzalez. Front: Stephanie Bissiere, Nico Plachta and Juan Silva.

#### Project 2. Cell dynamics of tissue formation

Plachta's team are using their live imaging tools to understand how individual cells move and interact with each other to form the first tissue-like layers of the embryo. They are studying morphological changes and migratory behaviour of individual mouse embryo cells in real time.

The Plachta Group aims to better understand how single cells behave in different parts of the embryo and how individual genes control cell dynamics in vivo.





## Faculty Development Program—the Heisler Research Group

The EMBL Australia Faculty Development Program (FDP) supports early-career scientists considered to show high potential in molecular biology research with long-term funding that enables them to establish a research career. The program provides research group leaders with generous funding for five years at an EMBL station in Europe, followed by four years at an Australian institution. Groups are funded by external Australian grants (for example, from the NHMRC or the Australian Research Council (ARC)) and/or by Australian research institutions.

Dr Marcus Heisler is the first FDP appointee and has been based at EMBL in Heidelberg, Germany, since 2009. He leads a research team of nine people, including post-doctoral researchers, PhD students and technical staff. His position is supported by the ARC and the University of Sydney. In 2010, Marcus was awarded a European Research Council Starting Grant for his project “The establishment and function of dorsiventral boundaries in plant organs”, and this will extend his stay in Germany by 18 months. After his time in Heidelberg, Marcus will relocate to the University of Sydney for the remaining years of his FDP appointment to underpin the NSW node of EMBL Australia.

Under the current associate membership with EMBL, EMBL Australia can place up to two group leaders at EMBL laboratories at any one time.

### Heisler Research Group—how do plants arrange their tissues?

Dr Marcus Heisler and his research group at EMBL in Heidelberg, Germany, are investigating developmental patterning in plants. They are looking at a fundamental question in plant developmental biology: how specialised tissues and organs become differentiated from embryonic cells and arranged into the stems, leaves and other structures as plants grow.

Using the small flowering annual *Arabidopsis thaliana*, whose simple genome is well understood, as a model, they are studying leaves and meristems (the growth zones) to understand the processes underpinning organogenesis—that is, how organs (in this case, leaves) are specified, differentiate and grow.



Heisler Group members (anti-clockwise from bottom left): Hanno Wolters, Philip Brennecke, Neha Bhatia, Marcus Heisler, Monica Pia Caggiano, Avisheck Paul, Carolyn Ohno, Paz Merelo, Hathi Ram, Pia Sappl and Nicol Siegel.

### Project 1. Coordination of plant organ positioning with cell type boundaries

Plant organs, such as leaves, have a dorsal-ventral arrangement of cells and tissues that leads to different types of cell forming on the top and bottom of the leaf. The Heisler Group have also observed this organisation in precursor tissues.

Using confocal-microscope-based imaging methods to examine protein localisation and gene expression in the tissues of growing plants, the team is investigating the complexity of these underlying patterning processes. The two main questions are:

- Does the boundary between dorsal and ventral cell types dictate where organs arise and, if so, how?
- How are the expression domains of the dorso-ventral patterning genes regulated?

The Heisler Group is also interested in the cellular response to wounding and subsequent tissue reorganisation.

### Project 2. Understanding embryogenesis at the single cell level

Techniques such as transcriptomics, which analyses all of the mRNA within a given cell or tissue to determine which genes are active, are very powerful tools for determining what cells and tissues are doing at a given point in time.

The Heisler Group is aiming to integrate single-cell transcriptomics with high-resolution 3D microscopy and microfluidics techniques in order to associate spatial information with genome-wide expression data at single-cell resolution. If successful, the approach should enable a broad but detailed view of development and it will serve as a tool for understanding gene function on a cell-by-cell basis.

## Key activities

### The new South Australian node at SAHMRI

In September 2012, the EMBL Australia Council approved the development of a new EMBL Australia node at the South Australian Health and Medical Research Institute (SAHMRI).

SAHMRI's flagship facility is currently under construction and due to open in late 2013. The Institute will house around 600 researchers and will focus on: Aboriginal health; cancer; heart health; nutrition and metabolism; healthy mothers, babies and children; infection and immunity; and mind and brain. There will also be a strong genomics and computational component across the themes.

Applications for three group leader positions in Biomedical Informatics opened in January, and more than 40 applications were received by the closing date at the end of February 2013. The recruitment process is scheduled to be completed and offers tendered by mid-2013.



*An artist's impression of the new SAHMRI facility.*

As with all EMBL Australia research group leader appointments, each position provides generous funding for five years with the option to extend it for another four years. Funding for the positions is supported by contributions from the University of Adelaide, the University of South Australia, Flinders University and the Government of South Australia.





## The Bioinformatics Resource Australia EMBL (BRAEMBL)

The Bioinformatics Resource Australia of EMBL Australia (BRAEMBL) is hosted by the Institute for Molecular Bioscience at the University of Queensland (UQ) and was established with the support of the Australian government's research infrastructure investments. It provides access to EMBL's European Bioinformatics Institute (EBI) databases and services.

### Development of the Bioinformatics Resource Australia

The Bioinformatics Resource was formed by merging the EMBL Australia Mirror of the EMBL-EBI with the National Computational Infrastructure (NCI) Special Facility for Bioinformatics.

The EMBL Australia Mirror of the EMBL-EBI was established in 2010 at the University of Queensland's Institute of Molecular Bioscience in response to a perception that Australian bioinformatics users were disadvantaged by geographical remoteness and IT connectivity. Within the context of Australia's associate membership of EMBL and EMBL Australia, it envisaged a tight collaboration with the EBI to mirror EBI services from UQ.

Around the same time, the NCI Special Facility for Bioinformatics was established to make computer power available for Australian Bioinformatics, with its hardware hosted by UQ's Research Computing Centre. The two groups have always been co-integrated within the same facility, and provide complementary services.

### Bioinformatics resources and services

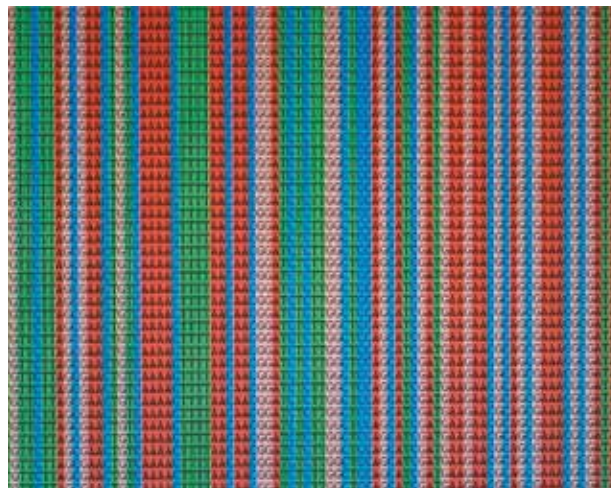
BRAEMBL provides Australian bioinformatics users with an extensive set of data analysis tools and databases and the computer power required to run larger-scale analyses.

The Resource provides services—it is not a research facility, although focused research is required to develop unique, customised data services in selected areas. It is managed in accordance with EMBL policies that emphasise open access to data.

The data resources include public-domain genome, DNA and protein sequences, protein structures and integrated data services for medical and agricultural sciences, biodiversity and biotechnology. Novel datasets and related capabilities, including integrated data services, are being added.

In conjunction with high-performance computing resources and scalable storage, and delivered through high-bandwidth national research networks, BRAEMBL enables large-scale integrated analyses that have previously not been feasible.

Over the last 12 months it has become clear that simply providing mirrored data from the EBI is not sufficient for a viable service. In fact, in some cases it is not possible to



mirror EBI services, and changes in the way data is shared and managed globally has meant that many users can directly access the EBI data and services they need from their desks.

Graham Cameron, the former head of EMBL's European Bioinformatics Institute, joined BRAEMBL as Director in October 2012. His role is to develop the Resource into a fully-fledged service that:

- enables optimal exploitation of the tools and data of bioinformatics by Australian scientists
- contributes to the global biomolecular information infrastructure in a way that showcases Australian science.

A survey of Australian bioinformatics needs and activities was conducted in February 2013. Responses were received from over 200 people, representing about 750 researchers and bioinformaticians. The main findings were that:

- bioinformatics is a core activity, not only for bioinformaticians but also for laboratory scientists
- geographic location imposes significant but not crippling limitations on Australian researchers
- lack of expertise, and access to expertise, in bioinformatics (including general IT and statistical expertise) is the most significant problem
- users prefer local services, ideally within their own group.

With that in mind, BRAEMBL will be redeveloping its role in 2013 as an IT resource provider and expertise-based group to:

- enable exploitation of EBI services by Australian scientists
- enable data download when use at the EBI is a problem
- curate Australian data within the global bioinformatics knowledgebase
- offer unique tools from Australia to the global bioinformatics community.

BRAEMBL underpins the Queensland node of EMBL Australia, and will support, and synergise with, all other EMBL Australia nodes and activities across the country.

It is intended that the Queensland node will be further developed by the establishment of research groups in addition to this infrastructure core.

## Key activities

### Australian Bioinformatics Network

The Australian Bioinformatics Network was launched in mid-2012 as an independent body jointly funded by EMBL Australia, Bioplatforms Australia and CSIRO. Dr David Lovell, Bioinformatics and Analytics Leader for CSIRO's Transformational Biology Initiative, was appointed Director in July 2012 and Benita Vincent joined as Executive Officer in February 2013.

The Australian Bioinformatics Network aims to connect people to:

- people
- resources, and
- opportunities

to increase the benefits Australian bioinformatics can deliver.

Via its website [www.australianbioinformatics.net](http://www.australianbioinformatics.net), the Network is a national information hub and forum for the Australian bioinformatics community. For the first time, Australia now has a central resource to share and record information on opportunities and events important to the Australian bioinformatics community. Membership of the Australian Bioinformatics Network (as measured by the number of registered members of the website) has increased steadily since the launch with 233 members at the end of February 2013. Traffic to the website is steadily increasing, in particular to the Events and Jobs pages.

Other website initiatives include the sharing of presentations via SlideShare (the presentations featured on the Australian Bioinformatics Network SlideShare have attracted over 12,000 views). The Network also supports a real-time discussion forum through Yammer, an enterprise social network, and is able to help members by managing event registration for events.

The Australian Bioinformatics Network provided financial support for EMBL-EBI trainers to travel to Australia for Next Generation Sequencing (NGS) workshops in Melbourne and Sydney in July 2012 and has since supported NGS workshops using local trainers in Brisbane and Adelaide (November 2012) and Canberra (February 2013).

Financial support was also provided to the Sydney Computational Biologists community initiative in October 2012, the Sydney Bioinformatics Research Symposium in November 2012 and the 3rd Brighton Bioinformatics Retreat in Melbourne in December 2012.

In November 2012, the Australian Bioinformatics Network signed a Memorandum of Understanding with the Global Organisation for Bioinformatics Learning, Education and Training (GOBLET). Dr Bruno Gaeta, from the University of New South Wales, represented Australia and the Asia-Pacific at the GOBLET kick-off meeting on 28 November 2012 in Amsterdam. The Australian Bioinformatics Network and the Asia Pacific Bioinformatics Network have agreed to jointly support Australia's engagement with GOBLET by jointly funding travel of Australian representatives.

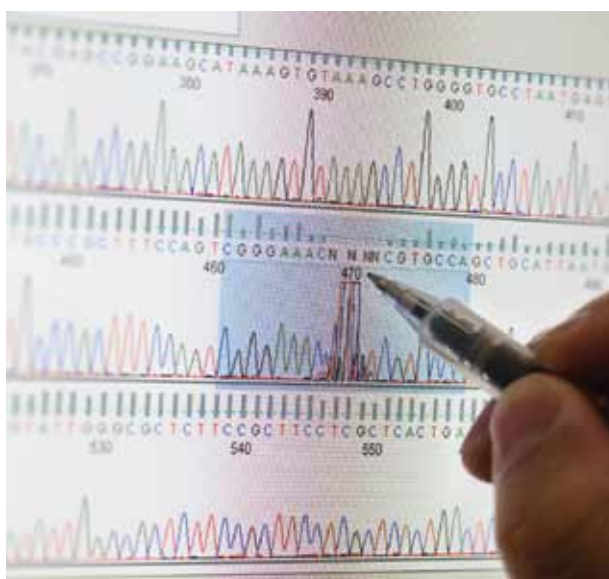
### Connection Grants

The Australian Bioinformatics Network Connection Grants are designed to fund activities that bring together people in the Australian bioinformatics community. These activities can include travel, support for national and international visitors, and sponsorship of meetings that strengthen professional networks.

Five proposals were received in the first round of grant applications, which opened in late January 2013. A second round of grants is expected to open in the second half of 2013.

The following proposals were awarded grants in mid-February, 2013:

- \$12,000 to fund two events bringing wheat bioinformaticians from across Australia to meet and share ideas and discuss the challenges posed by the wheat genome project (lead applicant Ute Baumann, Australian Centre for Plant Functional Genomics)
- \$3,000 to SBI Australia to bring Caltech scientist Dr Mike Hucka to Australia to talk about large-scale, open-sourced initiatives for computational biology and scientific computing (lead applicant Sarah Boyd, SBI Australia/EMBL Australia)
- \$10,000 to support two Software Carpentry boot camps in Adelaide and Brisbane to increase bioinformatics skill sets and provide opportunities for networking between bioinformaticians. Software Carpentry is a volunteer organisation that teaches scientists computer skills with the aim of making them better and more productive scientists (lead applicant Nathan Watson-Haigh, Australian Centre for Plant Functional Genomics and Bioinformatics Interest Group of South Australia).





## The Systems Biology Institute (SBI) Australia

The Systems Biology Institute (SBI) has established a node of the Institute in Australia, allowing the SBI to expand into the Australian scientific landscape. SBI Australia's headquarters are at Monash University in Melbourne.

SBI Australia will connect Japanese and Australian research and industry partners, and facilitate the sharing of scientific technology, resources and expertise.

This venture will promote transnational systems biology research, and deliver tangible benefits to research and development in both countries. SBI Australia will develop and support Australian systems biology capacity through research, training and outreach, and will provide the platform to connect and promote Australian research to the international systems biology community.

The current direction of the SBI Australia research program includes:

- characterising the systems that control the development of the first few cells in an embryo, with applications to improved IVF technologies
- understanding the different heart cell populations, especially non-myocyte cells (that is, cells other than muscle cells), to improve understanding of the normal and ageing adult heart
- investigating the robustness and fragility of coral reefs affected by environmental perturbations to develop countermeasures for coral bleaching, which is a threat to the survival of coral reefs globally.

SBI Australia will offer training to undergraduate and postgraduate students, and to post-doctoral researchers, in relevant disciplines including biology, mathematics, computer science, physics, engineering, and chemistry.

SBI Australia will also facilitate access to Australia's high performance computing capacity to support systems biology research through the provision of computing power and access to software platforms and resources such as the Garuda alliance, which is developing an open standard for sharing systems biology data and information, and Flint, which provides researchers with easy access to high-performance computing resources.



SBI Australia staff (L to R) Back: Silvio Tiziani, Sarah Boyd and Hieu Nim. Front: Madeleine van Oppen and Hiroaki Kitano.

### Systems Biology Conference

In late 2011, a consortium led by EMBL Australia was successful in a bid to host the 15th International Conference on Systems Biology (ICSB) in Melbourne in 2014.

EMBL Australia will use the opportunity of hosting the conference to boost the profile of systems biology in Australia.

Preparations for the conference got underway during 2012—confirming that it will be held from 13–19 September, 2014, at the Melbourne Convention and Exhibition Centre.

The conference Local Organising Committee has been convened with the following members:

**Silvio Tiziani**  
*EMBL Australia, as Chair*

**Tony Bacic**  
*Bio21 Molecular Science and Biotechnology Institute*

**Sarah Boyd**  
*SBI Australia*

**Niall Byrne**  
*Science in Public, also Chair of the Promotions and Marketing Subcommittee*

**Michelle Gallaheer**  
*BioMelbourne Network, also Chair of the Sponsorship and Exhibition Subcommittee*

**Andrew Gilbert**  
*Bioplatforms Australia*

**David Lovell**  
*CSIRO*

**Ivan Ng**  
*Monash University*

**Karen O'Connor**  
*Department of Defence, also Chair of the Social Program Subcommittee*

**Nadia Rosenthal**  
*EMBL Australia, also Chair of the Scientific Program Subcommittee*

**Tingting Zhang**  
*ICSB2015, committee member*

MCI International has been appointed as the Professional Conference Organiser.

## Key activities

### Student programs

EMBL Australia has a number of programs to give Australian PhD students access to advanced training and networking opportunities within Australia and overseas.

#### International PhD program

The EMBL Australia International PhD Program enables Australian students to undertake their PhD at an EMBL facility. The PhDs are jointly awarded and co-supervised by EMBL and the student's Australian Group of Eight university.

The Program offers Australian students the opportunity to be exposed to the EMBL philosophy and training. EMBL is renowned for the internationality of its students, the interdisciplinary nature of its training, the dedicated mentoring provided by its supervisors and the early independence granted to its researchers. Opportunities to do a PhD at EMBL are awarded competitively based on written applications, panel interviews and one-on-one meetings with the researchers. Entry to the program is extremely competitive. In addition to the stipend and a living allowance, the Program provides funding to support travel between Australia and EMBL for both the student and their Australian mentor. Students may also use an Australian Postgraduate Award for the program.

EMBL recruits PhD students twice a year, with positions available for up to three Australian students to commence each year. The 2012 call for applications (announced in late 2011) attracted 914 applications, and 137 applicants were invited for interview in February 2012. One Australian applicant, Simone Li from the University of New South Wales, was successful. She began the EMBL PhD program in September 2012.

#### Simone Li

Simone is a PhD candidate based at EMBL Heidelberg under the supervision of Dr Peer Bork, a senior scientist at EMBL Heidelberg, where he is Joint Head of the Structural and Computational Biology Unit and Strategic Head of Bioinformatics.



Her PhD project will focus on using metagenomics—the study of genetic material from environmental samples—to understand how faecal microbiota transplantation therapy can be used as a treatment and potential cure for diseases of the human digestive system. Many of these diseases, such as ulcerative colitis, are believed to arise from imbalances in gut microorganisms.

Simone will collaborate with Prof Thomas Borody at the Centre for Digestive Diseases in Sydney, who is a pioneer of the therapy.

She hopes the project will lead to improvements in the efficacy of the treatment, thus reducing the number of sufferers of these diseases.

Simone, who had never imagined doing her PhD at EMBL, says, "I have really enjoyed my time at EMBL so far. It has been an eye-opening experience—making friends not only from Europe but all over the world, seeing renowned scientists in the corridor everyday... and living it up in Europe of course!"

"Through the introductory pre-doctoral course, I had the opportunity to learn about technologies and techniques in areas of molecular biology I wouldn't have otherwise known about.

"I am also excited to be co-ordinating the EMBL International PhD Symposium this year. It is a conference fully organised by the first-year PhD students—we actually come up with the theme and program, and have to find funding!"



## Travel Grants

### PhD Symposium Travel Grants

EMBL Australia offers PhD Symposium Travel Grants, which allow students to attend the annual PhD Symposium organised by EMBL's first-year PhD students. Grants to the value of \$3,000 are available to support travel and accommodation expenses and a living allowance for students attending the symposium, which is held at EMBL's headquarters in Heidelberg, Germany, in November each year.

EMBL Australia supported 20 students to join the 14th EMBL PhD Symposium from 25–27 October 2012. The Australian group stood out, presenting half the student talks and winning two poster prizes.

Feedback from students who attended a conference or course at EMBL included:

***Lorey Smith, PhD student at the Peter MacCallum Cancer Centre***

"I formed many new contacts—both on a professional and friendship level—and I am confident this will prove to be an invaluable network in the years to come. I have returned to Australia armed with new knowledge, ideas and a feeling of inspiration!

"This trip represents an important milestone on my path towards independent research. These opportunities are directly relevant to my transition to independent research and form an invaluable foundation for my post-doctoral professional development."

***Samuel Forster, PhD student at the Monash Institute of Medical Research***

"The Networks in Life Sciences conference far exceeded my expectations and I am extremely grateful to EMBL Australia. I've been exposed to a number of currently unpublished and potentially useful approaches, techniques and perspectives. Since returning these insights have already had direct impacts on my on-going PhD research."

***Yee Suan Poo, PhD student at the Queensland Institute of Medical Research***

"I got to know several young researchers during the conference. Their enthusiasm has inspired me to be more attentive and to ask questions during each talk. I also greatly benefited from the insights and idea-sharing during the symposium's daily informal forum with the keynote speakers."

### PhD Travel Grants

EMBL Australia offers PhD Travel Grants covering travel and accommodation expenses and a living allowance for short-term visits of up to six weeks (up to \$3,500), or long-term residencies of up to six months (up to \$7,500).

It gives Australian PhD students the opportunity to attend:

- conferences, symposia or one of the many short courses operated by EMBL at the International Centre for Advanced Training (EICAT) in Heidelberg, Germany
- one of EMBL's comprehensive suite of courses, conferences and workshops in the life sciences
- laboratories of EMBL to undertake training for periods of up to 6 months.

EMBL Australia awarded travel grants to 13 students to attend EMBL for conferences (not including the PhD Symposium, above) and training, although not all trips were taken before the end of this annual report period.



***Li-Jeen Mah, PhD student at Baker IDI Heart and Diabetes Institute***

"Researchers who were interested in my work approached me to discuss the work presented in my poster and this allowed an exchange of views and ideas that were very helpful for future directions."

***Thuc Duy Le, PhD student at the University of South Australia***

"The ideas discussed in the conference are important to my current research, as they have inspired me to work on the upcoming paper for my PhD study. Moreover, I have established links with some high profile researchers in the field."

## Key activities

### Breakdown of grants

		NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
2012 Travel Grants	applied	2	8	2	4	0	0	0	0	17
	awarded	2	3	2	2	0	0	0	0	9
2012 Symposium Grants	applied	13	15	14	4	0	0	1	4	51
	awarded	7	7	3	2	0	0	0	1	20
2013 Travel Grants (round 1)*	applied	3	4	5	1	1	2	1	1	18
	awarded	0	2	1	0	0	1	0	0	4

\*2013 Travel Grants Round 1 applications were awarded in December 2012 for travel between 1 Jan and 30 June 2013. A second round of grants will be offered in the first half of 2013 for travel between 1 July and 31 December 2013.

### PhD Course

EMBL Australia launched a new concept in Australian research training—the EMBL Australia PhD Course, modelled on the compulsory pre-doctoral course attended by all incoming PhD students at EMBL. Aimed at giving PhD students a flying start, the course will provide a broad exposure to the life sciences through a two-week residential program of seminars, workshops and opportunities to meet other students from around the country as well as renowned Australian and international scientists. The inaugural course is scheduled to be held in July 2013 at the Walter and Eliza Hall Institute of Medical Research (WEHI) in Melbourne.



### AMSI Intern Bioinformatics Fellowships

In 2012, EMBL Australia and Bioplatforms Australia joined forces to sponsor up to three Australian Mathematical Sciences Institute (AMSI) Intern Fellowships in Bioinformatics. The intern program is an AMSI initiative that places students into industry research programs to obtain valuable experience.

The AMSI internship program is jointly funded by AMSI, EMBL Australia and Bioplatforms Australia as well as the industry partner. The research programs run for 4–5 months with contributions of \$3,000 per month from the industry partner. In addition, AMSI contributes \$5,000 for academic support and a further \$5,000 for pre-placement training for the student and administrative costs.

2013 internships were awarded to:

- Milica Ng, a PhD student at the University of Melbourne, who will intern at CSL under the mentorship of Matthew Ritchie from WEHI
- Sori Kang, also from the University of Melbourne, who will be working with the Victorian Life Sciences Computation Initiative with the support of Prof Bernie Pope at the University of Melbourne.



## Linkages with other facilities

EMBL Australia signed agreements with a variety of research organisations to support Australian life science research through joint activities including collaboration and sharing of resources and expertise via workshops, training and other opportunities.

Joint activities carried out with these organisations over the year include:

### Australian Genome Research Facility (AGRF)

- Mouse/Human Sequencing Advisories were prepared in conjunction with Australian Phenomics Facility and circulated in mid-2012. These documents have received international commendations.
- The Next-Gen bioinformatics workshop was held at Monash University on 1 August 2012. Targeted at biologists new to analysing Next-Gen Sequencing data, the workshop provided attendees with a snapshot of bioinformatics and data analysis to enable them to begin to analyse their project. Trainers included Matt Tinning (Next-Gen Sequencing Manager, AGRF), Dr Torsten Seemann (Victorian Bioinformatics Consortium, Monash University) and Dr Sonika Tyagi (Senior Bioinformatics Officer, AGRF).

### Australian Microscopy and Microanalysis Research Facility (AMMRF)

- The major activity arising from the current agreement has been the co-development of a Correlative Light Electron Master class (CLEM) to be conducted at University of Sydney on 3–6 June 2013. CLEM will have presenters from EMBL and Australia.

### Australian Nuclear Science and Technology Organisation (ANSTO)

- ANSTO is currently exploring ways to engage with EMBL via EMBL Australia.
- Dr Adi Paterson, ANSTO CEO, chaired the Panel for the Mid-term Review of EMBL Australia in September 2012.

### Australian Phenomics Facility (APF), Australian National University

- Mouse/Human Sequencing Advisories were prepared in conjunction with AGRF – see above.
- Discussions are progressing regarding arrangements for EMBL Australia to become a member of the International Mouse Phenotyping Consortium (IMPC). The IMPC is dedicated to making available a collection of mouse strains in which the function of every gene in the genome is known.

### BioGrid Australia

- SBI Australia and BioGrid Australia are currently exploring ways for BioGrid expertise and infrastructure to support collaborative activities.
- SBI Australia and BioGrid have identified potential collaborative projects that they will pursue in 2013.

### Bioplatforms Australia

- Bioplatforms Australia offers subsidised services to EMBL Australia group leaders.
- Bioplatforms Australia, CSIRO and EMBL Australia have jointly established the Australian Bioinformatics Network.
- Next Generation Sequencing (NGS) workshops were developed in conjunction with EBI and conducted at Monash University 12–13 July and University of NSW, 16–17 July. Workshops were designed to familiarise participants with next Generation Sequence data analysis and to provide hands-on computational experience in analysis of NGS data using common analytical approaches for ChIP-seq, RNA-Seq data and de novo genome assembly. Trainers included Dr Matthias Haimel, Dr Remco Loos, and Myrto Kostadima, all from EMBL-EBI, UK.
- EMBL Australia and Bioplatforms Australia are jointly funding the AMSI Intern program
- BRAEMBL is working with Bioplatforms Australia to build systems to manage and share coral reef genome data generated by the Sea-quence project, which is also supported by Rio Tinto and the ReFuGe 2020 consortium (which includes The Great Barrier Reef Foundation, James Cook University, the Australian Institute of Marine Science, the University of Queensland, the Great Barrier Reef Marine Park Authority, the King Abdullah University of Science and Technology (Saudi Arabia) and the Australian National University).

### Systems Biology Institute (Japan)

- SBI has established its first international node, SBI Australia, in collaboration with EMBL Australia.
- In addition, SBI has commenced scientific collaboration with EMBL Australia group leader Dr Nicolas Plachta.
- Opportunities for additional collaborations will be identified throughout 2013 as Prof Hiroaki Kitano visits key stakeholders throughout Australia.

# Governance

## Participants

EMBL Australia is an un-incorporated joint venture between the Group of Eight universities (Australian National University, Monash University, The University of Adelaide, The University of Melbourne, The University of New South Wales, The University of Queensland, The University of Sydney, The University of Western Australia) and CSIRO, with the support of the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE).

## EMBL Australia Council

The EMBL Australia Council includes two representatives from each participating institution as well as a number of independent scientist members.

Council members include:

### Chair

**Prof Richard Larkins, AO**

### Australian National University

**Prof Andrew Cockburn**

*Director of the ANU College of Medicine, Biology & Environment*

**Prof Chris Goodnow**

*Head of the Department of Immunology*

### CSIRO

**Dr Louise Ryan**

*Chief of Mathematical and Information Sciences (until March 2012)*

**Dr Graeme Woodrow**

*Health Advisor, Preventative Health Flagship*

**Dr Sean O'Donoghue**

*OCE Science Leader, Mathematics, Informatics and Statistics, and Garvan Institute for Medical Research (from July 2012)*

### EMBL

**Prof Iain Mattaj**

*Director General*

**Dr Silke Schumacher**

*Head of International Relations and Communications*

### Monash University

**Prof Edwina Cornish**

*Provost and Senior Vice-President*

**Prof Ross Coppel**

*Deputy Dean and Director of Research of the Faculty of Medicine, Nursing and Health Sciences*

### The University of Adelaide

**Prof Mike Brooks**

*Deputy Vice-Chancellor and Vice-President (Research)*

**Assoc Prof Paul Thomas**

*School of Molecular and Biomedical Sciences*

### The University of Melbourne

**Prof Jim McCluskey**

*Deputy Vice Chancellor (Research)*

**Prof Paul Gleeson**

*Head of the Department of Biochemistry and Molecular Biology*

### The University of New South Wales

**Prof Merlin Crossley**

*Dean of Science*

**Prof Warwick Dawson**

*Director of Research Partnerships*

### The University of Queensland

**Prof Deborah Terry**

*Senior Deputy Vice-Chancellor*

**Prof Brandon Wainwright**

*Director of the Institute for Molecular Bioscience*

### The University of Sydney

**Prof Trevor Hambley**

*Dean of Science*

**Prof Jill Trehwella**

*Deputy Vice-Chancellor (Research)*

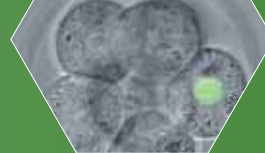
### The University of Western Australia

**Prof Peter Leedman**

*Head of the Laboratory for Cancer Medicine and Deputy Director of the West Australian Institute for Medical Research*

**Prof Robyn Owens**

*Deputy Vice-Chancellor (Research)*



## Independent Members

### Prof David Day

*Deputy Vice Chancellor and Vice President (Research) at Flinders University of South Australia*

### Prof Simon Foote

*Dean of the Australian School of Advanced Medicine at Macquarie University*

### Prof Steve Wesselingh

*Executive Director of the South Australian Health and Medical Research Institute*

### Prof Doug Hilton

*Director of the Walter and Eliza Hall Institute of Medical Research*

## Observers:

### Tony Rothnie

*Science and Infrastructure Division, Department of Industry, Innovation, Science, Research and Tertiary Education (now DIICCSRTE)*

### Claire McLaughlin

*Science and Infrastructure Division, Department of Industry, Innovation, Science, Research and Tertiary Education (now DIICCSRTE)*

## Meeting dates:

Tuesday 10 July 2012 (Canberra)

Tuesday 11 December 2012 (Sydney)

## Executive Committee of Council

The EMBL Australia Executive Committee members are:

### Prof Richard Larkins AO

*Chair of the EMBL Australia Council*

### Prof Nadia Rosenthal

*Scientific Head of EMBL Australia*

### Prof Edwina Cornish

*Provost and Senior Vice-President, Monash University*

### Prof David Day

*Deputy Vice Chancellor and Vice President (Research), Flinders University of South Australia*

### Prof Brandon Wainwright

*Director of the Institute for Molecular Bioscience, University of Queensland*

### Prof Trevor Hambley

*Dean of Science, University of Sydney*

### Dr Silke Schumacher

*Head of International Relations and Communications, EMBL*

### Dr Graeme Woodrow

*Health Advisor, Preventative Health Flagship, CSIRO*

### Silvio Tiziani

*Executive Director of EMBL Australia*

## Meeting dates:

Tuesday 7 February 2012 (Melbourne)

Thursday 29 March 2012 (Sydney)

Thursday 14 June 2012 (Adelaide)

Friday 16 November 2012 (Melbourne)

## Bioinformatics Advisory Committee

The role of the Bioinformatics Advisory Committee of EMBL Australia Council is to assist and advise the Council in all matters relating to the provision of bioinformatics and related services to the EMBL Australia research nodes and the Australian life sciences research community.

The Bioinformatics Advisory Committee members are:

### Dr Louise Ryan (Chair)

*Chief of CSIRO Mathematics, Informatics and Statistics (until March 2012)*

### Dr Sean O'Donoghue (Chair)

*OCE Science Leader, CSIRO Mathematics, Informatics and Statistics, and Garvan Institute for Medical Research (from December 2012)*

### Prof Nadia Rosenthal

*Scientific Head of EMBL Australia*

### Prof Dave Adelson

*Head, School of Molecular & Biomedical Science, University of Adelaide*

### Dr Jean Yee Hwa Yang

*Senior Lecturer in the School of Mathematics and Statistics, University of Sydney*

### Dr Ewan Birney

*Associate Director of the EMBL-European Bioinformatics Institute*

### Dr Vivien Bonazzi

*Program Director, Genome Informatics and Computational Biology, National Human Genome Research Institute*

### Prof Paul Bonnington

*Director of e-Research at Monash University*

## Governance

### Dr David Lovell

*Director of the Australian Bioinformatics Network, and  
Bioinformatics and Analytics Leader, CSIRO*

### Prof Grant Morahan

*Director of the Centre for Diabetes Research, Western  
Australian Institute for Medical Research*

### Prof Mark Ragan

*Head of Genomics and Computational Biology, Institute for  
Molecular Bioscience, University of Queensland*

### Prof Terry Spee

*Head of Bioinformatics Division at the Walter and Eliza Hall  
Institute of Medical Research*

### Mr Silvio Tiziani

*Executive Director of EMBL Australia*

### Prof Marc Wilkins

*University of New South Wales*

### Observers:

#### Andrew Gilbert

*Bioplatforms Australia*

#### Catherine Shang

*Bioplatforms Australia*

### Meeting date:

Friday 9 March 2012 (Melbourne)

## Mid-term Review of EMBL Australia

In September 2012, a review of EMBL Australia was conducted as part of the requirements of the original agreement between the Australian Government and EMBL when Australia became an Associate Member.

The review was conducted over two days by a committee comprising:

### Dr Adi Paterson (Chair)

*CEO of ANSTO*

### Prof Roberto Di Lauro

*President at Stazione Zoologica "Anton Dohrn" of Naples, full  
Professor of Medical Genetics at the "Federico II" University  
of Naples and Project Advisor at the Istituto di Ricerche  
Genetiche "Gaetano Salvatore" in Ariano Irpino, Italy*

### Prof Terry Speed

*Head of the Bioinformatics Division at WEHI in Melbourne  
and Department of Statistics at the University of California,  
Berkeley*

### Prof Marianne Bronner

*Albert Billings Ruddock Professor of Biology at the California  
Institute of Technology and Chair of EMBL Australia Scientific  
Advisory Committee*

The final report from the review was completed in February 2013 and tabled with the Australian Government Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education at the end of February 2013.

Recommendations from the review will be considered by the EMBL Australia Executive Council and implemented during 2013–2014.



# Outreach activities

## Invited presentations at seminars and conferences

### **Nadia Rosenthal, Silvio Tiziani and Hiroaki Kitano**

Australia-Japan Workshop on Biomedical Breakthroughs, Japan Science and Technology Agency, 16 October 2012, Tokyo, Japan

### **Sarah Boyd**

AMSI Careers Session, 16 January 2013, Melbourne, Vic

### **Graham Cameron**

ICT for Life Sciences Forum, 28 June 2012, Melbourne, Vic

eResearch Australasia 2012, 22–25 October 2012, Sydney, NSW

### **Marcus Heisler**

10th International Congress on Plant Molecular Biology, 21–26 October, 2012 Jeju, South Korea

### **Hiroaki Kitano**

BioMelbourne Network Breakfast, 5 June 2012, Melbourne, Vic

Charles Perkins Centre, University of Sydney, 8 August 2012, Sydney, NSW

Defence Science and Technology Organisation, 4 December 2012, Melbourne, Vic

### **David Lovell**

BioInfoSummer, 3–7 December, Adelaide, SA

Sydney Bioinformatics Research Symposium, Garvan Institute, 9 December, Sydney, NSW

3rd Brighton Bioinformatics Retreat, December 2012, Melbourne, Vic

### **Edwina McGlinn**

ComBio 2012, 23–27 September 2012, Adelaide, SA

COST (European Co-operation in Science and Technology Action) Meeting—Hox and Tale Transcription Factors in Development and Disease, 28 Nov– 1 Dec 2012, Barcelona, Spain

### **Nicolas Plachta**

The 12th Hunter Meeting, 27–30 March 2012, Hunter Valley, NSW

EMBL Meeting, 5 November 2012, Buenos Aires, Argentina

## Publications

Chickarmane VS, Gordon SP, Tarr PT, **Heisler MG** and Meyerowitz EM, *Cytokinin signaling as a positional cue for patterning the apical-basal axis of the growing Arabidopsis shoot meristem*. Proceedings of the National Academy of Sciences of the USA, 2012, 109:4002–7

Federici F, Dupuy L, Laplaze L, **Heisler M** and Haseloff J, *Integrated genetic and computation methods for in planta cytometry*. Nature Methods, 2012, 9:483–5

**Heimberg A** and **McGlenn E**, *Building a Robust A-P Axis*. Current Genomics, 2012, 13(4): 278–288

Hu JK, **McGlenn E**, Harfe BD, Kardon G and Tabin CJ, *Autonomous and nonautonomous roles of Hedgehog signaling in regulating limb muscle formation*. Genes & Development, 2012, 26(18): 2088–2102

Mansfield JH and **McGlenn E**, *Evolution, expression and developmental function of Hox-embedded miRNAs*. Current Topics in Developmental Biology, 2012, 99: 32–54

**Sappl P** and **Heisler MG**, *Live-imaging of plant development: latest approaches*. Current Opinion in Plant Biology, 2013, 16:33–40

## Sponsorship

EMBL Australia was a proud supporter of several workshops and courses during the year including:

- the 2012 Winter School in Computational and Mathematical Biology, 2–6 July 2012, Queensland Bioscience Precinct, University of Queensland, Brisbane
- travel grants for seven students to attend BioInfoSummer 2012, 3–7 December 2012, University of Adelaide, SA
- the Australian Society for Medical Research student symposiums in Queensland, Victoria and Western Australia during Medical Research Week, 1–8 June 2012
- student prizes at the Genetics Society of Australasia 2012 conference (GSA2012), 15–18 July 2012, Melbourne, Vic
- a satchel insert at the Australian Neuroscience Society's 33rd Annual Meeting (ANS2013), 3–6 February 2013, Melbourne, Vic
- the Next Generation Sequencing Workshop series held in Melbourne and Sydney (July 2012), Brisbane and Adelaide (November 2012) and Canberra (February 2013)

## Outreach activities

- student travel grants for the Australian Protein Production Symposium, 9–11 July, University of Queensland, Brisbane
- trade display at ComBio 2012, 23–27 September 2012, Adelaide, SA.

## Visitors

### EMBL Australia staff visits

Nadia Rosenthal, Silvio Tiziani and Sarah Boyd were part of a delegation visiting the Systems Biology Institute (SBI) in Tokyo, Japan, in October 2012.

Graham Cameron visited EMBL-EBI in December 2012.

Gavin Graham, Gerald Hartig, Jeremy Parsons, Alexander Varlakov visited EMBL-EBI in April 2012.

Hiroaki Kitano and Sarah Boyd visited the Charles Perkins Centre, University of Sydney, 8 August 2012.

Edwina McGlenn and Alysha Heimberg undertook fieldwork at Tampa Bay, Florida, USA in July-August 2012.

### Visitors to EMBL Australia

Graham Cameron visited EMBL Australia and BRAEMBL from 20 June to 1 July 2012 (prior to joining as Director).

Matthias Hentze, Associate Director at EMBL, visited EMBL Australia on 13–14 August 2012.

Hiroaki Kitano visited EMBL Australia in June, August and December 2012.

Adi Paterson (ANSTO), Terry Speed (WEHI), Roberto di Lauro (University of Naples), Marianne Bronner (California Institute of Technology), Silke Schumacher (EMBL) visited EMBL Australia to attend the Mid-term Review meetings in Adelaide and Melbourne on 27–28 September 2012.

Federico Frascoli, University of Melbourne, visited EMBL Australia on 19 February 2013.

Shuichi Onami, RIKEN Quantitative Biology Center, Japan, visited EMBL Australia in March 2012.

Madeleine van Oppen, Australian Institute of Marine Science and now an affiliate of SBI Australia, visited EMBL Australia in November 2012.

## Communication activities

EMBL Australia communicates with its stakeholders via regular newsletters and social media.

### Newsletter

In 2012, the newsletter was re-launched in a new format: a monthly email update with useful information for EMBL Australia's partners and stakeholders.

As EMBL Australia has grown, so has the newsletter, which now reaches more than 1000 researchers, students and leaders in science and government. It features news from each of the nodes and initiatives of EMBL Australia, as well as events, grants, and profiles of researchers and international visitors.

### Social media

In 2012, EMBL Australia launched a Facebook page and a Twitter account. The pages are mainly used to promote EMBL Australia events and programs, in particular opportunities for students and young researchers.

In less than a year, the pages have attracted about 300 fans and followers. Many are younger researchers and students from Australia, but there is also a strong international following, with about two-thirds of followers being from other countries—mostly Europe and Asia, but also Egypt, Mexico and Canada.

By linking in to the social media presence of partners in the Group of Eight universities, CSIRO and the various EMBL facilities, the EMBL Australia accounts can have a wider impact, with recent posts reaching upwards of 600 people.



### EMBL Australia on social media



EMBLAustralia



@EMBLAustralia  
@BRAEMBL



EMBL Australia

## EMBL Australia in the media

The focus in 2012 has been on communicating directly with EMBL Australia's stakeholders, but Scientific Head Prof Nadia Rosenthal's profile in the Australian media is also growing. She's been called to comment on various issues in Australian science, and has been profiled personally on the ABC and in Melbourne's The Age.

Below are some of the articles

ABC TV, Friday 21 December 2012

One Plus One, by Sophie Scott

<http://www.abc.net.au/news/2012-12-21/one-plus-one/4440490>



ABC Radio PM, Friday 23 November 2012

Rapid progress of the science of aging, by Mark Colvin

<http://www.abc.net.au/pm/content/2012/s3639889.htm>



Wednesday 10 October 2012, Australian Financial Review  
Visionary waited for cloning theory to hatch,  
by Dominic White

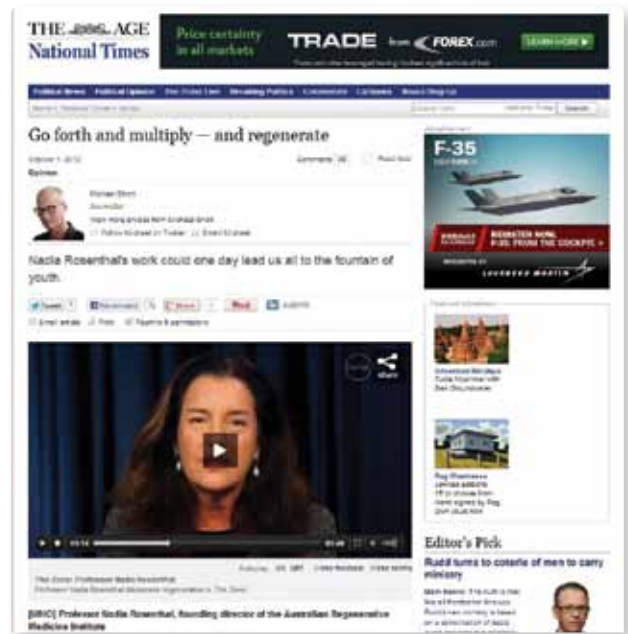
[http://www.afr.com/p/national/visionary\\_waited\\_for\\_cloning\\_theory\\_8s9swWb8XszffC4HiiPfuK](http://www.afr.com/p/national/visionary_waited_for_cloning_theory_8s9swWb8XszffC4HiiPfuK)

Monday 1 October 2012, The Zone, The Age

Go forth and multiply — and regenerate,

by Michael Short

<http://www.theage.com.au/opinion/go-forth-and-multiply--and-regenerate-20120930-26tmq.html>



Monday 20 August 2012, The Australian

Career pathways could let us 'lead world' in science,

by Pia Akerman

<http://www.theaustralian.com.au/news/health-science/career-pathways-could-let-us-lead-world-in-science/story-e6fgr8y6-1226453671884>

Wednesday 28 March 2012, The Age

Zebrafish help put us ahead of pack, by John Brumby

<http://www.theage.com.au/opinion/society-and-culture/zebrafish-help-put-us-ahead-of-pack-20120327-1vwfa.html>

## Alumni activities

By now a significant number of Australian researchers have studied or worked at EMBL. Many now work in senior positions in Australian institutions.

EMBL Australia has invited over 50 such people to form an EMBL alumni group, and is looking for opportunities to involve them in EMBL Australia's programs.

For example, EMBL alumni are guiding the development of the inaugural PhD training course to be held in 2013. Alumni were also invited to join selection panels for EMBL Australia research positions and grant programs.

Next year, EMBL Australia plans to hold exclusive alumni networking events in each state, to coincide with conferences or visiting speakers.

# Staff

## EMBL Australia leadership team

### **Prof Nadia Rosenthal**

*Scientific Head*

Nadia has exceptional scientific credentials, including 16 years working at Harvard Medical School and over 10 years as Director of the EMBL outpost in Monterotondo, Italy. She is also the Scientific Director of ARMI at Monash University, and serves as Scientific Director of the Heart Science Centre at Imperial College, London.

### **Silvio Tiziani**

*Executive Director*

Silvio is a member of the Australian Institute of Company Directors (AICD) and the Australian Institute of Management (AIM). He has extensive experience in financial analysis and budget management, business development, strategic planning, leadership and corporate governance, and is currently Chief Operating Officer of the Australian Regenerative Medicine Institute.

### **Prof Peter Currie**

*Head, Victorian node*

Peter is a developmental geneticist, using the powerful zebrafish model to look at the development and regeneration of skeletal muscle in the context of diseases like muscular dystrophy. He is the Deputy Director of ARMI and was appointed Head of EMBL Australia's Victorian node in September 2012. Before he came to ARMI, Peter worked at the Medical Research Council's Human Genetics Unit in Edinburgh.

### **Graham Cameron**

*Director, EMBL Australia Bioinformatics Resource, University of Queensland*

Graham joined EMBL in 1982 to work on the world's first public DNA database. In 1986 he took over the leadership of that project, and developed the concept for the European Bioinformatics Institute (EBI) and oversaw its launch. Until April 2012 he was responsible for the EBI's databases and services. In October 2012 he joined the University of Queensland to direct the Bioinformatics Resource Australia of EMBL.

### **Dr David Lovell**

*Director, Australian Bioinformatics Network*

David has worked in research management within the quantitative biosciences domain since 2004. He's been the Bioinformatics and Analytics Leader for CSIRO's Transformational Biology initiative since 2008, and was appointed Director of the Australian Bioinformatics Network in July 2012.

An electrical engineer by training, David completed post-doctoral research in perinatal risk prediction at Cambridge University before joining CSIRO in 1998. Since then, he has been involved in a wide range of research and consulting in the analysis of large and complex datasets. David worked as Executive Officer to the CEO from 2001–2002 and was a member of CSIRO's Corporate IT Management team from 2002–2004.

### **Dr Sarah Boyd** (from October 2012)

*Developer, Systems Biology Research Platform, ARMI, Monash University*

Sarah has a background in computer science, biochemistry and molecular biology, and has undertaken a variety of research projects at the interface of computer science, mathematics and the life sciences. She has worked in a variety of departments and faculties at Monash and La Trobe Universities, and has been a visiting researcher at the Sanford-Burnham Medical Research Institute (San Diego, USA), the Monash Institute of Medical Research (Melbourne, Australia), and the Walter and Eliza Hall Institute of Medical Research (Melbourne, Australia).

Sarah combines the research practices, cultural differences, and methodologies of these diverse fields to develop new approaches to research questions in the life sciences, and she has published national and international collaborative research in journals for computer science, bioinformatics, biochemistry and molecular biology, microbiology, allergies, and biotechnology. She is now spearheading the establishment of SBI Australia, and also sits on the organising committee for the International Conference on Systems Biology in Melbourne in 2014.





## Research group leaders

### **Dr Marcus Heisler**

*Group Leader, NSW node (currently based at EMBL, Germany)*

Marcus joined EMBL's Heidelberg laboratory as a group leader in 2009, through EMBL Australia's Faculty Development Program. His research investigates developmental patterning in plants. Prior to joining EMBL he was a post-doctoral researcher in Elliot Meyerowitz's lab at California Institute of Technology. He completed his PhD at Monash University in 2000.

### **Dr Edwina McGlinn**

*Group Leader, Victorian node*

Edwina joined EMBL Australia as a group leader in January 2011. She completed her PhD at the University of Queensland in 2002. More recently, she was a researcher at Harvard University where she started looking at the role of microRNAs in development processes.

### **Dr Nicolas Plachta**

*Group Leader, Victorian node*

Nicolas joined EMBL Australia as a group leader in July 2011. He completed his PhD at the University of Basel, Switzerland, before undertaking his post-doctoral studies at California Institute of Technology.

## Researchers

### **Neha Bhatia**

*ERC-funded Pre-doctoral Student  
Heisler Group*

### **Philip Brennecke**

*Pre-doctoral Student  
Heisler Group*

### **Monica Pia Caggiano**

*Pre-doctoral Student  
Heisler Group*

### **Dr Jesus Casanova**

*Research Fellow  
McGlinn Group*

### **Dr Andre Clapson**

*EIPOD Post-doctoral Researcher  
Heisler Group*

### **Eamon Coughlan**

*PhD Student  
McGlinn Group*

### **Cristina Massa Gomez** (from January 2013)

*Research Technician  
McGlinn Group*

### **Dr Juan-Carlos Fierro Gonzalez**

*Research Fellow  
Plachta Group*

### **Dr Alysha Heimberg**

*Research Fellow  
McGlinn Group*

### **Dr Gurpreet Kaur**

*Research Fellow  
Plachta Group*

### **Dr Paz Merelo**

*ERC-funded Post-doctoral Researcher  
Heisler Group*

### **Carolyn Ohno**

*Technician  
Heisler Group*

### **Dr Hathi Ram**

*ERC-funded Post-doctoral Researcher  
Heisler Group*

### **Dr Nicol Siegel**

*EIPOD Post-doctoral Researcher  
Heisler Group*

### **Juan Carlos Silva**

*Research Assistant  
Plachta Group*

### **Dr Melanie White** (joined June 2012)

*Research Fellow  
Plachta Group*

### **Lisa Wong**

*Research Assistant  
McGlinn Group*

### **Xiulian Yu**

*ERC-funded Pre-doctoral Student  
Heisler Group*

### **Dr Jennifer Zenker**

*Post-doctoral Researcher  
Plachta Group*

## Staff

### EMBL Australia Secretariat

**Jane McCausland**  
*Student Programs Coordinator*

**Penny Rowlett**  
*Senior Financial Officer*

**Laura Crilley**  
*Executive Officer*



Secretariat (L to R) Silvio Tiziani, Jane McCausland, Laura Crilley and Penny Rowlett.

### EMBL Australia Bioinformatics Resources (BRAEMBL)

**Graham Cameron** (from October 2012)  
*Director*

**Mark Crowe** (from October 2012)  
*Outreach, Training and Communication*

**Elham Gharazi**  
*HPC Applications Support Specialist*

**Gavin Graham**  
*Systems Manager*

**Dr Gerald Hartig**  
*Applications Manager*

**William Hsu** (from June 2012)  
*System Admin*

**Webber Liao** (from February 2013)  
*Bioinformatician*

**Dr Grischa Meyer** (until September 2012)  
*Bioinformatician*

**Dr Jeremy Parsons** (from April 2012)  
*Bioinformatician*

**Eric Powell** (from February 2013)  
*Bioinformatician*

**Nick Rhodes**  
*System Admin*

**Danny Sheehan** (from April 2012)  
*System Admin*

**Alexander Varlakov**  
*Web Developer*

**Kerri Wait** (until March 2012)  
*Occupational Trainee*

**Lanna Wong**  
*Executive Officer*

### SBI Australia

**Dr Sarah Boyd** (from October 2012)  
*Developer, Systems Biology Research Platform*

**Prof Hiroaki Kitano**  
*Director, Systems Biology Institute (Japan)*  
*Sir Louis Matheson Distinguished Visiting Professor,*  
*Monash University*

**Samik Ghosh**  
*Honorary Research Fellow*

**Yukiko Matsuoka**  
*Honorary Research Fellow*

### Australian Bioinformatics Network

**Dr David Lovell** (since July 2012)  
*Director*

**Benita Vincent** (since February 2013)  
*Executive Officer*



Australian Bioinformatics Network staff: David Lovell and Benita Vincent.

**Virginia Tressider** (from July 2012)  
*Communications Officer*

**Dr Torsten Seemann**  
*Volunteer*  
*Monash University*

**Dr Catherine Shang**  
*Volunteer*  
*Bioplatforms Australia*

# Financial report

	Actual 2011	Actual 2012	Notes
<b>Income</b>			
<i>Grant Funding</i>			
DIISR Funding Agreement	\$2,000,000	\$2,000,000	1
DIISR / Super Science (for Bioformatics Network)	\$355,000		
SBI Australia		\$40,000	2
Commercial	\$9,921	\$6,439	
Other Revenue – Interest	\$195,526	\$209,848	
<b>Total Income</b>	<b>\$2,560,446</b>	<b>\$2,256,287</b>	
<b>Expenditure</b>			
<i>Salary Expenses</i>			
Salary of support staff (Exec Officer, Exec Ass, Project Officers)	\$159,854	\$348,364	
Salary of research staff (Group Leaders, Research staff)	\$423,842	\$591,948	
Casual salaries		\$939	
Transfer / Recovery of Salary		\$96,930	
Other Salary Related Expenditure	\$318	\$14,713	
Agency Staff		\$36,961	
Visitor Expenses		\$15,518	
<i>Non Salary Expenses</i>			
Student Awards & Scholarships		\$83,864	
Travel & Related	\$93,187	\$145,271	
Staff Related	\$16,647	\$17,174	
Print & Stationery	\$19,142	\$14,099	
Other Expenses	\$108,272	\$28,477	
Laboratory	\$117,540	\$188,245	
Grants & Donations	\$27,500	\$16,000	
Book & Library	\$10,255	\$78	
Infrastructure	\$15,866	\$97,988	3
<i>Equipment Adjustment 2012</i>		-\$164,966	
Finance & Admin	\$5,111	\$6,767	
Consultants		\$89,316	4
Capital	\$761,672	\$7,995	
<b>Total Expenses</b>	<b>\$1,759,205</b>	<b>\$1,635,682</b>	
Net Operating Result	\$801,242	\$620,605	
<b>Previous Year Carry-forward</b>	<b>\$3,618,511</b>	<b>\$4,419,753</b>	
Net Balance at the End of Year	\$4,419,753	\$5,040,358	

## Notes

1. 2012 is the final year of funding from DIISR
2. Systems Biology Australia (SBI Aust)
3. Equip related adjustment 2012 relates to 2011 purchase of microscopy equipment for Plachta Group
4. EMBL Australia Communication service is provided by consultant Science in Public

# Auditor's report



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## **INDEPENDENT AUDITOR'S REPORT TO THE COMMONWEALTH DEPARTMENT OF INNOVATION, INDUSTRY, SCIENCE AND RESEARCH**

This audit opinion is prepared for the purpose of the Grant Agreement dated 11th December 2009 for the EMBL Australia Partner Laboratory Network ("the Project") between the Commonwealth of Australia as represented by the Department of Innovation, Industry, Science and Research and Monash University.

### **Scope**

We have conducted an independent audit in accordance with Australian Auditing Standards of the attached Statement of Income and Expenditure ("the Statement") for the period 1 January 2012 to 31 December 2012. The Statement specifies an amount of \$1,635,682 of expenditure on the Project and an amount of \$2,256,287 of contributions towards the Project.

Our audit involved an examination, on a test basis, of evidence supporting the amount of the grant funds incurred, and the amount of the income received on the Project. This included an examination of the University's financial records, and receipts, and an evaluation of the policies and procedures used to calculate the expenditure on the Project. These procedures have been undertaken to form an opinion as to whether the methodology used to calculate the expenditure is in accordance with the Agreement, and that the figures stated are true and fair.

This audit opinion expressed in this report has been formed on the above basis.

### **Audit Opinion**

We confirm that:

- the Statement of Income and Expenditure is true and fair;
- the funding was expended for the project in accordance with the Agreement; and
- the balance of funds as at 31 December 2012 is \$ 5,040,358.

RSM Bird Cameron  
Chartered Accountants

### **WARWICK SPARGO**

Director  
15 March 2013  
Melbourne, Victoria

Liability limited by  
a scheme approved  
under Professional  
Standards Legislation

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RSM Bird Cameron  
ABN 65 319 382 479

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Melbourne, Adelaide  
and Canberra

RSM Bird Cameron is a member of the RSM network. Each member of the RSM network is an independent accounting and advisory firm which practises in its own right. The RSM network is not itself a separate legal entity in any jurisdiction.



# Funding and stakeholders

## Participants

- Australian National University
- CSIRO
- Monash University
- The University of Adelaide
- The University of Melbourne
- The University of New South Wales
- The University of Queensland
- The University of Sydney
- The University of Western Australia

## Funding and in-kind support

The following in-kind and financial contributions to the EMBL Australia initiative are acknowledged.

### ***Australian Government, Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education***

- Super Science Funding—for support of the EMBL Australia research groups and the Australian Bioinformatics Network
- International Science Linkages Grant—to support development of the EMBL Australia secretariat

### ***Australian National Data Service***

- Financial support to establish BRAEMBL (previously the EMBL Australia Mirror of the EMBL-EBI Facility at the University of Queensland) via a separate agreement with the University of Queensland

### ***Bioplatforms Australia***

- Access to core research facilities and services
- Financial support to establish the EMBL Australia Mirror of the EMBL-EBI Facility at the University of Queensland (via a separate agreement with the University of Queensland)

### ***Systems Biology Institute***

- Financial support to establish Systems Biology Institute Australia

### ***CSIRO***

- Financial contribution to the Associate Membership subscription

### ***Group of Eight universities***

- Support for International PhD Program and preparation of Framework Agreement

### ***Monash University***

- Financial contribution to the Associate Membership subscription
- Accommodation for the partner laboratory groups and access to research facilities
- Office accommodation and corporate support services (including legal and payroll) for EMBL Australia secretariat and research staff

### ***NCRIS***

- Financial contribution to the Associate Membership subscription

### ***Australian Research Council***

- Financial support for Faculty Development Program (Dr Marcus Heisler)

### ***The University of Queensland***

- Financial contribution to the Associate Membership subscription

### ***The University of Sydney***

- Financial contribution to the Associate Membership subscription
- Financial support for Faculty Development Program (Dr Marcus Heisler)

### ***The University of Western Australia***

- Financial contribution to the Associate Membership subscription

### ***Victorian Government, Department of Business and Investment***

- Financial support for the establishment of the secretariat

## Affiliations

EMBL Australia has affiliations with the following organisations:

- Australian Genome Research Facility ([www.agrf.org.au](http://www.agrf.org.au))
- Australian Microscopy and Microanalysis Research Facility ([www.ammrf.org.au](http://www.ammrf.org.au))
- Australian Nuclear Science and Technology Organisation ([www.ansto.gov.au](http://www.ansto.gov.au))
- Australian Phenomics Facility, Australian National University ([apf.anu.edu.au](http://apf.anu.edu.au))
- BioGrid Australia ([www.biogrid.org.au](http://www.biogrid.org.au))
- Bioplatforms Australia ([www.bioplatforms.com.au](http://www.bioplatforms.com.au))
- Systems Biology Institute, Japan ([www.sbi.jp](http://www.sbi.jp))

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EMBLAustralia



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@BRAEMBL



EMBL Australia

## Acknowledgements

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Science in Public.

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## Participants



## Secretariat

