



QUALITY

2017 Annual Report



BIOPLATFORMS
AUSTRALIA

NCRIS

National Research
Infrastructure for Australia

An Australian Government Initiative



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CHAIRMAN'S REPORT

Les Trudzik

Ten years of progress

Since our foundation a decade ago, Bioplatforms Australia has evolved to become a key force in building national access to 'omics capabilities and enabling world leading science. We are proud to have established a robust and high calibre research network that has kept pace with the 'omics revolution and allowed Australia to step to the forefront of systems biology approaches.

Our coordinated infrastructure network provides an important base from which to power the big data demands of modern biology. We are now involved in pioneering 'omics initiatives within biomedicine, agriculture and environmental research which have been instrumental in consolidating and expanding Australia's 'omics capabilities. We have also made a significant contribution to establishing new funding models and cultural frameworks that cultivate cross-discipline collaboration, universally acknowledged as a critical success factor for high quality science.

Our National Framework Dataset Program, commenced in 2010, has been a centrepiece of Bioplatforms Australia's efforts and successes. So far, 14 collaborative projects have been established to draw together research, industry and government resources for the benefit of important research challenges. This multi-institutional yet non-proprietary approach has

increased the depth and impact of 'omics research whilst also cementing a new paradigm of shared funding and open access to high-cost infrastructure and data resources. In short, we have been able to transcend institutional and disciplinary boundaries to enable new opportunities for world class research outcomes.

Planning for the next decade

We have taken care to widely consult with the scientific community so that our national infrastructure network continues to underpin transformative science. The extensive consultations that Bioplatforms Australia commissioned and reported on last year defined the following strategic drivers for high impact 'omics capabilities:

- keeping pace with the rapid evolution in 'omics technologies
- increasing interdisciplinary research
- meeting the challenge of integrating enormous and diverse datasets

- strengthening bioinformatics capabilities to keep pace with the volume and uptake of 'omics data
- increasing industry engagement to get scientific advances into the hands of end-users
- securing opportunities to mainstream 'omics into health care, agricultural practice and environmental initiatives.

The consultations endorsed our existing focus on collaborative science, technology integration and industry engagement, but also amplified the need to:

- guard against infrastructure obsolescence
- advance and harmonise skills and methods
- grow networks between leaders in 'omics research and domain specialists, including international forerunners.

Leading transformative science

Consultations with the research sector reaffirmed the need to ensure access to the latest 'omics tools and expertise and recommended that we redouble efforts to integrate 'omics capabilities. In response we are increasing the scale and diversity of 'omics collaborations around specific domains, such as cancer or industrial biotechnology. These new 'critical mass' centres will link with peak science programmes to intensify systems biology research in areas of national priority while still maintaining open access for all other research. In doing this, a central focus is scientific quality and data integrity so that activities delivered by every facility in our network are underpinned by quality accreditations, harmonised methods and data commons.

High impact research

Since our inception literally hundreds of new findings have been supported directly by Bioplatforms Australia initiatives, or indirectly supported through open access to funded research infrastructure. In 2016/17 alone, four projects supported by Bioplatforms Australia were published in Nature, a prestigious journal renowned for the finest peer-reviewed research. These projects will achieve more than international recognition, they will also deliver improved food security, better survival rates for melanoma, and new knowledge of Aboriginal migration and genetic history which could assist people from the Stolen Generations to reconnect with their heritage.

Data delivery

There has been continued solid progress on all framework dataset projects over the last year. Our two newest dataset collaborations, Oz Mammal sequencing and Environomics, are well underway and have commenced sample analysis. Environmental barcoding, koala, and melanoma sequencing goals have been completed and these dataset collaborations are already serving diverse research objectives. The aforementioned Nature paper on melanoma is a testament to the critical value the datasets deliver.

Peak partnerships

We strive for a deep engagement with peak research organisations and meritorious research. We are a partner in all relevant ARC Centres of Excellence, including the newly created Centre for Australian Biodiversity and Heritage. Likewise, Bioplatforms Australia is involved in a number of industry focussed research projects related to wine, synthetic biology, alertness for safety and productivity and Environomics, the new environmental genomics platform which holds enormous promise for Australia's agricultural and marine industries. In the commercial arena, Bioplatforms Australia supported a further six industry projects with access vouchers so that 'omics services could be more readily employed for new product development.

Funding matters

Our work and mission continues to be supported by NCRIS and it is pleasing to be able to report that we have been allocated \$29 million to sustain the Bioplatforms Australia research network and continue with the framework dataset initiatives.

We also received \$2 million through the NCRIS Agility Fund which has been deployed for new DNA sequencing technology. This funding will ensure ongoing access to high quality, large scale genomic data.

A team effort

The Commonwealth Government's 2016 National Research Infrastructure Road Map reiterated the need for excellence in research infrastructure and scientific talent to achieve high-impact research results. It also affirmed that Bioplatforms Australia plays a vital role in managing 'omics infrastructure and generating critical datasets.

In achieving this, I wish to acknowledge the effort and contribution of our platform convenors, Prof. Marc Wilkins (Genomics), Prof. Ian Smith (Proteomics), Prof. Tony Bacic (Metabolomics) and Prof. Matthew Bellgard (Bioinformatics) and facility leaders. They have played a huge

part in fostering quality science and growing Bioplatforms Australia's reputation and influence. This was Tony's last year as part of our executive team and warrants a special mention. As the founding convenor for Metabolomics, Tony has played a critical and formative role in building it into the strong platform that it is today. We wish Tony well in his future endeavours.

I am also indebted to my fellow directors Dr Sue Meek, Dr Katherine Woodthorpe and Prof. Peter Gray for their expert counsel and advice in guiding Bioplatforms Australia in its mission. Their deep experience in the sector has been invaluable and has helped the Board to provide informed, objective and independent oversight of Bioplatforms Australia.

Lastly, and most importantly, the contribution of the General Manager, Andrew Gilbert, and his small and highly effective team are central to Bioplatforms Australia's strong ongoing achievements. This is not only recognised by the Board but by peers more widely in the sector. Andrew has been with Bioplatforms Australia since the outset and his role has been instrumental in the many outcomes recorded in this Annual Report.



Dr Les Trudzik
Chairman

BIOPLATFORMS AUSTRALIA

Bioplatforms Australia enables bioscience innovation through open access to world class 'omics research capabilities.

Bioplatforms Australia's mission is to boost Australian genomics, proteomics, metabolomics and bioinformatics research capabilities through strategic investments in scientific research infrastructure and personnel. Our ultimate goal is to enable innovation by equipping researchers with critical scientific infrastructure and catalysing research collaborations that can transform scientific outcomes into tangible benefits for Australians.

Coordinated Research Network

Bioplatforms Australia's infrastructure network incorporates 17 leading universities and research institutes from around Australia. As a whole, our network offers comprehensive 'omics technologies relevant to agriculture, biomedicine, food, and environmental research.

Bioplatforms Australia coordinates national funding and co-investments to ensure that 'omics instrumentation, facilities and expertise can deliver

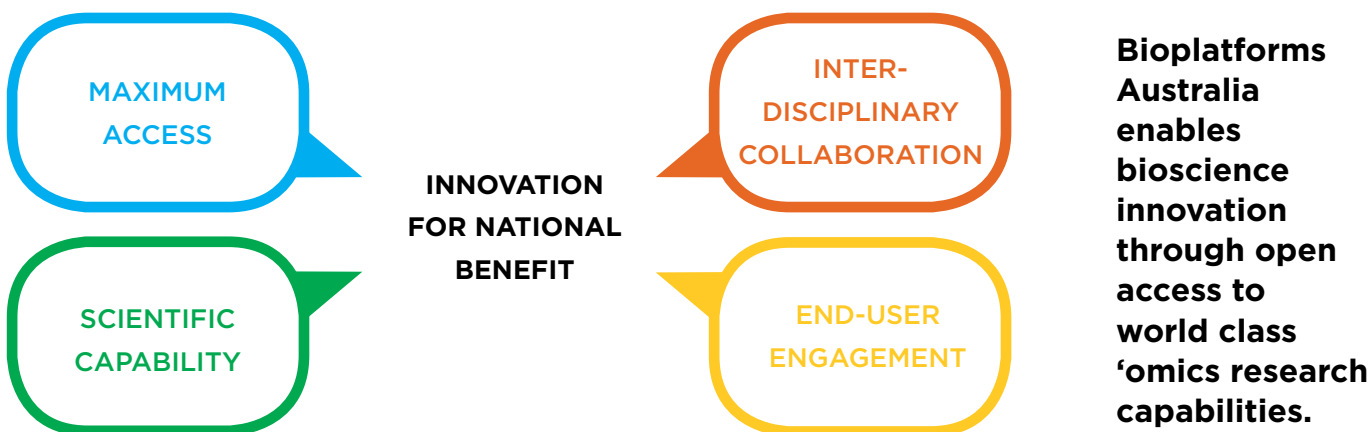
the world class capabilities that are needed to meet Australia's research challenges and deliver beneficial scientific outcomes. These capabilities are shared with all Australian researchers through contracted services and research collaborations.

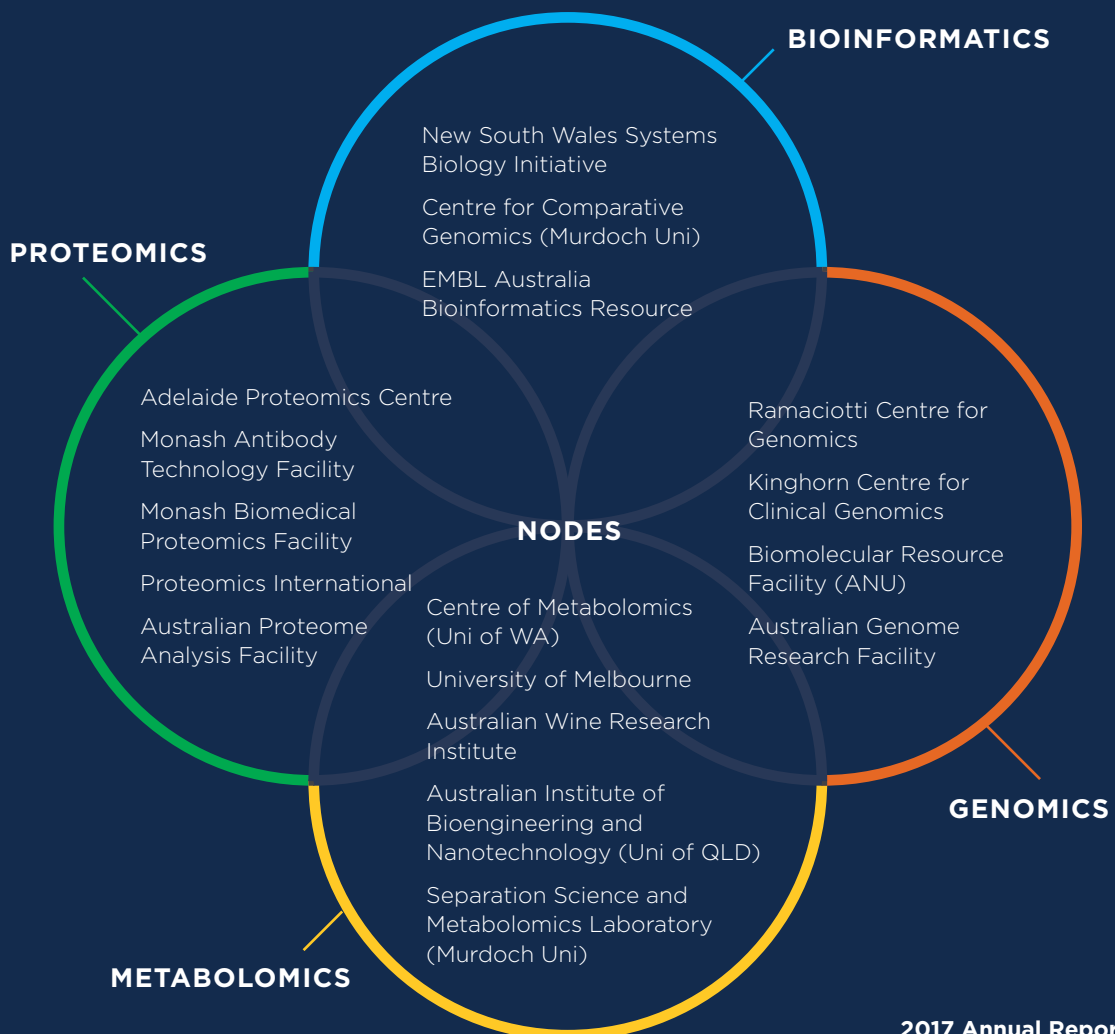
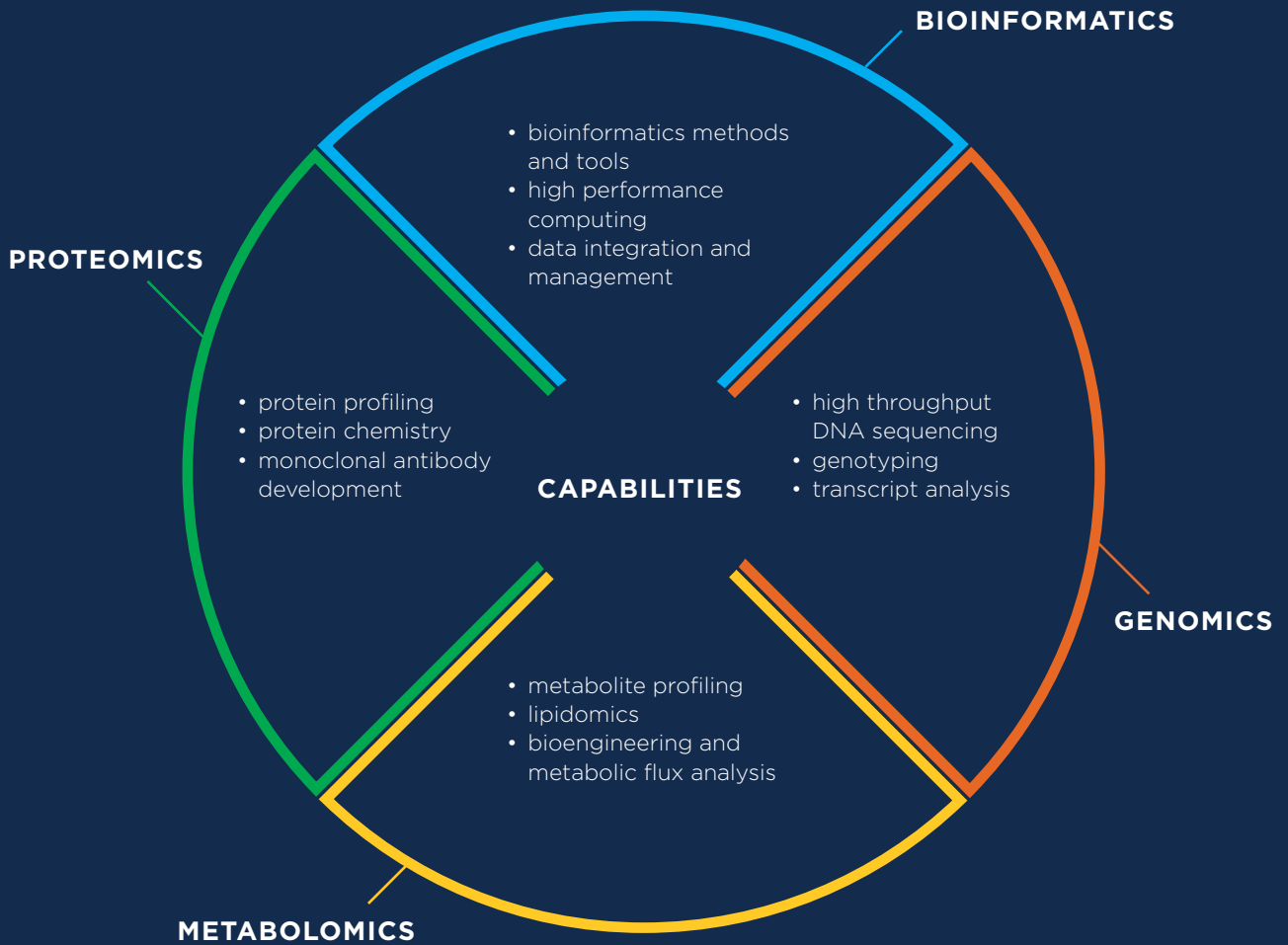
Advocacy

We actively engage with researchers, policy makers and funding agencies to ensure our work and investments support Australia's life science community and research priorities.

Partners

The Bioplatforms Australia infrastructure network is organised into four technology platforms to ensure a complementary suite of 'omics technologies and expertise. Our network partners receive funding to enhance their capabilities and capacity which can be broadly accessed by the research community.





QUALITY SCIENCE OBJECTIVES

Good science leads to novel ideas and new technologies. Poor science lacks rigour and fails to advance our understanding.

Even with the right tools and people in place, good science, the kind that meets every standard of integrity, needs to be decisively cultivated. Bioplatforms Australia has placed significant strategic focus on fostering high quality science which strongly influences our funding decisions and evaluation processes.

Accordingly, the following criteria are applied to all our investment and partnership decisions:

Strategic investments in research infrastructure and expertise

- Aligned with national research priorities for health, environment, agriculture and industry
- Bolster existing and emerging research strengths
- Address capacity requirements
- Counter instrument obsolescence

Meritorious partnerships

- Focus on cross-discipline collaboration
- Enhance flagship and peak research programs
- Engage with the international science community
- Engage end-users to facilitate community and commercial outcomes

Influential quality policies

- Develop and retain a highly skilled workforce
- Promote methods harmonisation and data commons
- Encourage and disseminate international best practice in methods and techniques
- Ensure implementation of accredited quality systems



QUALITY SCIENCE OUTCOMES

Bioplatforms Australia has successfully boosted access to 'omics capabilities to enable transformative research and Australian scientific successes.

Over the 10 years following our foundation, a burgeoning publication profile has become a solid testament to the thousands of new findings that have been directly supported by Bioplatforms Australia or indirectly supported through open access to funded research infrastructure.

In 2016/17 we are pleased to announce the following highlights:

Access

Our network partners provided research services to more than 4,400 users and 170 collaborators through framework dataset projects, flagship research programs, industry engagement projects and bioinformatics training.

World Class Capabilities

Bioplatforms Australia funded 230 scientists including a team of embedded bioinformaticians. Instrumentation is world-class and a program to address impending obsolescence is underway. The ambitions and reach of ten active framework dataset collaborations contributed over 40 terabytes of reference data while also forging new 'omics techniques and data manipulation strategies. Likewise, we continue to run bioinformatics training workshops attended by 131 participants during the year and almost 1,300 researchers since our first workshop was developed.

World Class Innovation

Infrastructure funded by Bioplatforms Australia was utilised

and acknowledged in more than 600 research papers including four high impact genomics projects that were published in the prestigious international journal, Nature. Over 80 grants awarded to our nodes will utilise NCRIS-funded infrastructure as part of their high calibre research.

Framework Datasets

Ten active dataset projects are generating genomic, proteomic and metabolomics framework datasets which are immediately relevant for high priority research projects and made publicly accessible for spin out projects. Numerous research papers and presentations are linked to the datasets demonstrating their vital contribution to high impact research outcomes.

Quality Research Partnerships

Numerous partnerships have been established to support flagship research programs. We are a key partner in the CSIRO's mega-sequencing Environomics Future Science Platform as well as the 'Australian Biodiversity and Heritage' project which received an ARC Centre of Excellence grant.

We are also providing key 'omics capabilities to one of Australia's biggest collaborative projects 'Preparing Australia for the Genomics Revolution in Healthcare ' which was awarded a \$25 million grant from the National Health and Medical Research Council. Our own Oz Mammals dataset project is also a large collaboration involving over 30 organisations.

Commercialising Quality Science

Six new innovation partnerships were established with commercial entities to boost 'omics integration with new product development. Industry access vouchers have now been awarded to 18 commercialisation projects.

Investment Funding

Bioplatforms Australia invested over \$14 million of Commonwealth Government funding in the research capabilities of network partners, research collaborations, training and network access.

2016/17 HIGHLIGHTS



CAPABILITY

- 17** world-class nodes
- \$14M** invested
- 15** embedded bioinformaticians
- 230** funded scientists



ACCESS

- 4,476** users
- 6** Industry Access Vouchers
- 131** bioinformatics workshop attendees



FRAMEWORK DATA COLLABORATIONS

- 10** active dataset projects
- 167** science and industry collaborators
- 40** terabytes of data



SCIENTIFIC OUTCOMES BY NODES

- 600** research papers
- 80** successful grant applications

NETWORK ACCESS

Bioplatforms Australia continues to enable complex biology through high levels of access to 'omics infrastructure and research services.



Since our inception ten years ago, we have monitored the number of researchers that access 'omics services from our network partners in order to gain some insight on the impact and relevance of our infrastructure network. Our annual results are measured against a pre-NCRIS baseline recorded in 2006/07, the year before Bioplatforms Australia was founded.

As indicated by the graph on client numbers, researcher access has more than trebled in the decade since the concept of a coordinated 'omics research network was launched. Although our raw figures don't take full account the varied nature of work undertaken, some 35,500 projects have been supported with the best 'omics technology and expertise available. Furthermore, many of these projects have been able to integrate the capabilities of multiple nodes for a systems biology approach.

The client numbers graph also indicates that access has plateaued in recent years. As instrumentation is often running at full capacity and large-scale projects are increasing, we are confident that researcher access would expand given additional capacity.

Revenue indicates larger scale projects

Even though client numbers have plateaued, service revenues have increased by more than 25 per cent both this year and last and now total \$40 million. This substantial rise in

average spend from a steady user base is likely to reflect the major burst of activity in large-scale projects now possible in modern 'omics science.

It is clear that high sample throughput and decreasing costs per sample has allowed full genome studies and population screening to flourish.

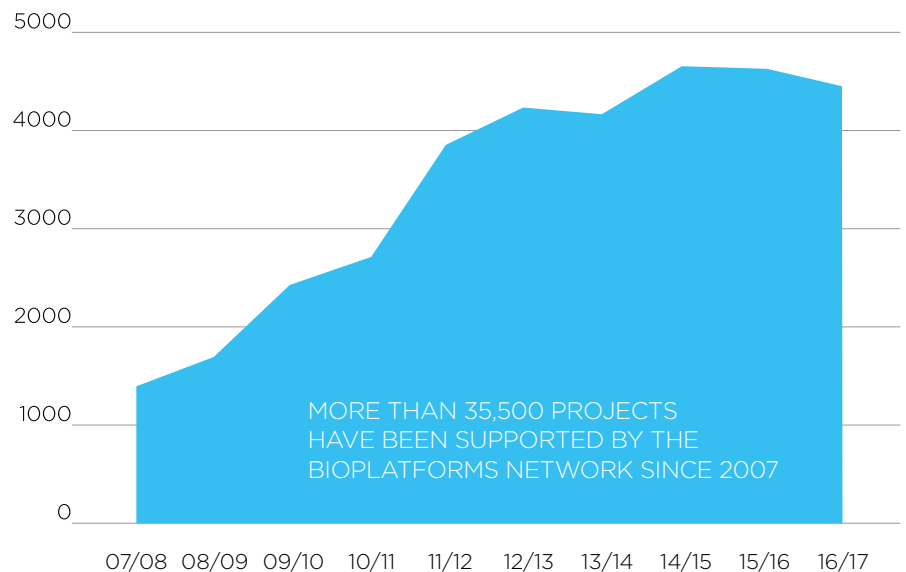


FIG 1. CLIENT ACCESS FROM 2007 TO 2017

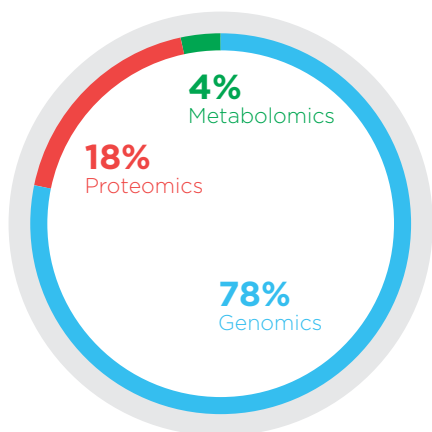


FIG 2.
CLIENT ACCESS BY PLATFORM

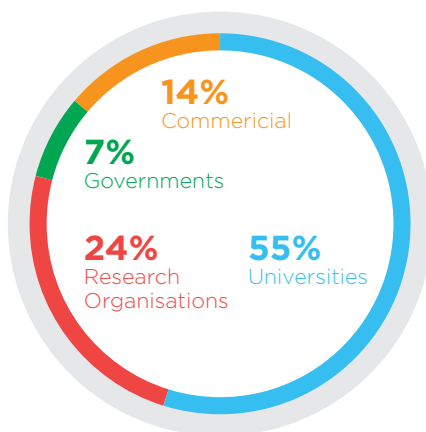


FIG 3.
CLIENT ACCESS BY SECTOR

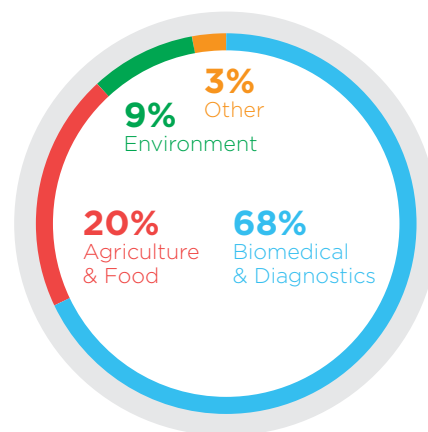


FIG 4.
CLIENT NUMBERS BY DISCIPLINE

Genomics demand remains high

The demand for DNA sequencing continues to increase in line with expanding genomics applications in healthcare, agriculture, and environmental management. Large-scale DNA screening is now employed in every biological field and is a critical component of biomedical research. Healthcare trends are also driving strong demand as the sector actively seeks to integrate genomics into clinical workflows. A case in point is the two large health alliances that are employing our 'omics platforms to develop genomics methods for more effective disease diagnosis and personalised treatment.

This strong demand for genomics capabilities is reflected in our access statistics for 2016/17 with 78 per cent of all research clients utilising genomics capabilities. Of course, pivotal research requires the convergence of genomics insights with proteomics and metabolomics data and systems biology approaches will continue to rely on the capabilities our other 'omics platforms.

User Profile

Unsurprisingly, almost 80 per cent of clients accessing our infrastructure network are university based or come from other research organisations. Access by commercial/industry-based clients equals 14 per cent of all users while government clients made up seven per cent.

At a platform level, genomics and metabolomics serve more university clients than those from any other sector while more than 50 per cent of proteomics clients come from commercial/industry sectors.

Broad Access

It is important that our national infrastructure network is available to all researchers and that access to 'omics capabilities extends beyond the host institution. A few of our nodes including AGRF and APAF are long-established service providers with few internal clients while other nodes are embedded in universities or research precincts and serve a higher level of university-based clients. In 2016/17 our benchmarking data indicated broad accessibility with 89 per cent of all clients across the network being external to the host institution.

Researcher Focus

Biomedical research continues to be the predominant focus for all platform services with two thirds of our clients working in this field. Agriculture is also a strong focus across all platforms. Genomics services are currently most prevalent for this sector on account of the many gene mapping endeavours focused on plant breeding and crop performances.

Environmental research continues to be a significant focus for our nodes. In line with previous years, access for environmental research is again around nine per cent. The environmental sector utilises all three platforms for its research programs and has potential to increase its usage as biodiversity studies continue to expand.



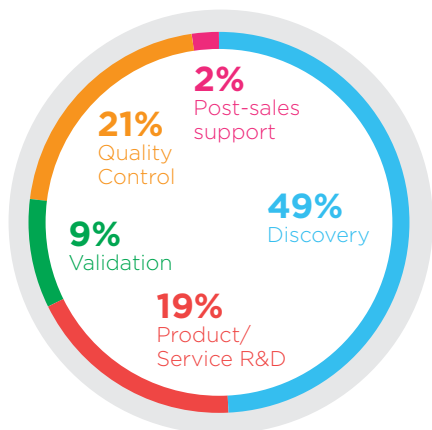


FIG 5.
ACCESS BY COMMERCIAL CLIENTS

Commercial Focus

When looking at industry and corporate clients it is interesting to note that discovery work constitutes around 50 per cent this sector's projects while translational activities such as product development, validation, quality control and post-sales support make up the other half.

Bioinformatics Training

Access to bioinformatics capabilities continues to be an important mission for Bioplatforms Australia. Since 2012, we have been collaborating with the CSIRO to run bioinformatics workshops that will enable life science researchers to analyse their genomics data using publicly accessible software tools and resources. The initiative aims to alleviate research bottlenecks caused by the boom in data generation and the shortage of bioinformatics skills.

A number of workshops have been designed and developed for Australian researchers, originally with the assistance of the EMBL-European Bioinformatics Institute (EBI) in the UK and more lately with assistance from the Garvan Institute of Medical Research, the Earlham Institute (UK) and the Broad Institute of MIT and Harvard University (USA).

Over the last three years, the success of the program attracted the support of the NSW Office of Health and Medical Research (OHMR) which

provided funding to design and develop new workshops specifically for biomedical and clinical researchers in the ACT and NSW. We successfully delivered these workshops with assistance from NSW and national partners and will receive further funding from OHMR to extend the program for a fourth year.

Experienced bioinformaticians deliver the workshops following training at EMBL-EBI and the Earlham Institute in the UK. To broaden the reach of the training program, eight experienced instructors from the Bioplatforms Australia training network participated in the world first "Train-the-Trainer Instructor" program run by EMBL-EBI. Participants from this program then went on to train a further 16 Australian bioinformaticians at the GOBLET-ELIXIR Train-the-Trainer workshop in Brisbane.

To date, we have extended our trainer network to 25 instructors and delivered a total of 47 workshops to 1,283 attendees. Feedback collected from the participants is consistently positive.

2016/17 Training Highlights

Last financial year we hosted four bioinformatics workshops covering data analysis techniques for next-generation sequencing, clinical genomics, and RNA Seq. Two Train-the-Trainer courses were also run.

Workshops	6
Attendees	131
Represented organisations	53
Trainers in the Bioplatforms Australia network	25
Training collaborators	7
Number of different workshops in 2016/17	5
Feedback rating of 'good' or 'excellent'	88%



NATIONAL FRAMEWORK DATASET PROGRAM

Access to big data is critical for innovative life science research. Bioplatforms Australia's National Framework Data Program generates reference genomes and other biological datasets to support Australian research endeavours and international collaborations.

Over the life of our dataset program, we have invested in 14 collaborative projects that integrate genomic data with large-scale protein and metabolite analyses.

The inter-disciplinary and multi-institutional nature of the projects ensures that the datasets are relevant to current scientific questions and immediately employed for high impact research. The value of the datasets has been regularly proven by our more mature projects that have catalysed scientific publications, spin out projects and commercial benefits in healthcare, improved agricultural performance, and environmental understanding and protection.

National framework datasets are created from samples that are specifically collected and prepared by research partners or drawn from biobanks. The program as a whole represents a mammoth asset for researchers. With the help of over 167 collaborators, 24,551 samples have been analysed to date generating over 42 terabytes of data. The total data resources attributed to the program continuously grow as existing projects progress, new collaborations are formed and more biobanks are linked with the program.

FRAMEWORK DATASET PROJECTS

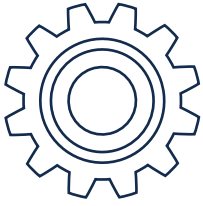
The National Framework Dataset Program represents a mammoth scientific resource for Australian scientists.

Sequencing goals have been completed for four of our dataset projects. The wheat, melanoma, koala and environmental barcoding datasets have been made publicly accessible and now serving diverse research objectives. These datasets will grow in value as researchers mine and extend the data.

Sample collection and sequencing is ongoing for the remaining ten dataset collaborations. Oz Mammals and Environomics are our two newest and largest projects and making excellent progress in sample sequencing and analysis. Over the next year we will review opportunities for new projects and hope to instigate new collaborations that supply sought-after data resources.



2016/17 Dataset Record



4 projects completed
10 active projects



24,551 samples analysed



167 collaborating organisations



42 terabytes of data

Program benefits lead to quality science

All our dataset projects promote quality life science by drawing together research and industry expertise to generate critical data resources. This ensures Australia advances its research leadership in areas of strength as well as emerging fields where we have pioneering potential. The high ambitions and calibre of project collaborators regularly attract international interest and, as a result, all projects have been successful in building international linkages.

At a strategic level, our National Framework Data Initiatives represent a cornerstone of our investment program as it:

- catalyses 'big data' programs in themes of national significance;
- promotes collaboration and partnerships of enduring value;
- maximises the impact of national research infrastructure;
- builds capabilities in systems biology;
- encourages and disseminates new scientific methods and techniques; and
- attracts co-investment to enable greater scale and impact.

Melanoma project an exemplar

In 2011/12 Bioplatforms Australia helped form a broad collaboration of universities, cancer institutes, clinicians and funders to create large-scale datasets of 500 melanoma tumours. The project is the first whole genome study of a large cohort of melanoma sub-types and represents the largest repository of linked melanoma data in the world.

The datasets enabled the coalition of 50 researchers to compare the mutational processes of melanoma sub-types and publish the results of 183 samples in the prestigious Nature journal. Another five papers have been published and others are underway demonstrating the enormous potential of the data to deliver new melanoma diagnostics and treatments.

Bioplatforms Australia's involvement in the melanoma dataset project is a key factor in linking cutting edge 'omics infrastructure and bioinformatics capabilities with peak research bodies and end-users. As an independent co-ordinator, we ensure that the datasets are non-proprietary and publicly accessible so they have utility far beyond melanoma research.

The melanoma dataset project exemplifies our ambitions for the framework dataset program. In this case, it enabled high quality research through a broad collaboration of 19 organisations. At the same time, our seed funding helped to attract financial contributions from other



organisations and philanthropists. Other pleasing outcomes include the linkages that have been established with international researchers and the new bioinformatics methods and techniques that were developed to meet the significant challenges posed by the 200+ terabytes of 'omics data that were generated. These methods are now being applied to the National Health and Medical Research Council supported project, "Preparing Australia for the Genomics Revolution".

Capturing the value of biobanks

Tissue banks in hospitals and research centres along with the biobanks at museums and other organisations provide a treasure trove of information for scientists. Bioplatforms Australia will look for opportunities where valuable bioarchives can be unlocked and transformed into data resources for beneficial research. The melanoma project, together with our environmental barcoding, koala, OZ Mammals and Environomics collaborations have all been utilising biobanks to generate genomic data and we intend to support other initiatives that promise the same.

Oz Mammals Genomics Initiative

The Oz Mammals Genomics Initiative announced last year is drawing from curated specimens held in

national and international museums and collections. This Australia-wide collaboration of more than 30 institutions will create genome reference data that will be used to reduce the extinction rates of Australia's unique mammals and provide new insight into their evolution and inter-relationships.

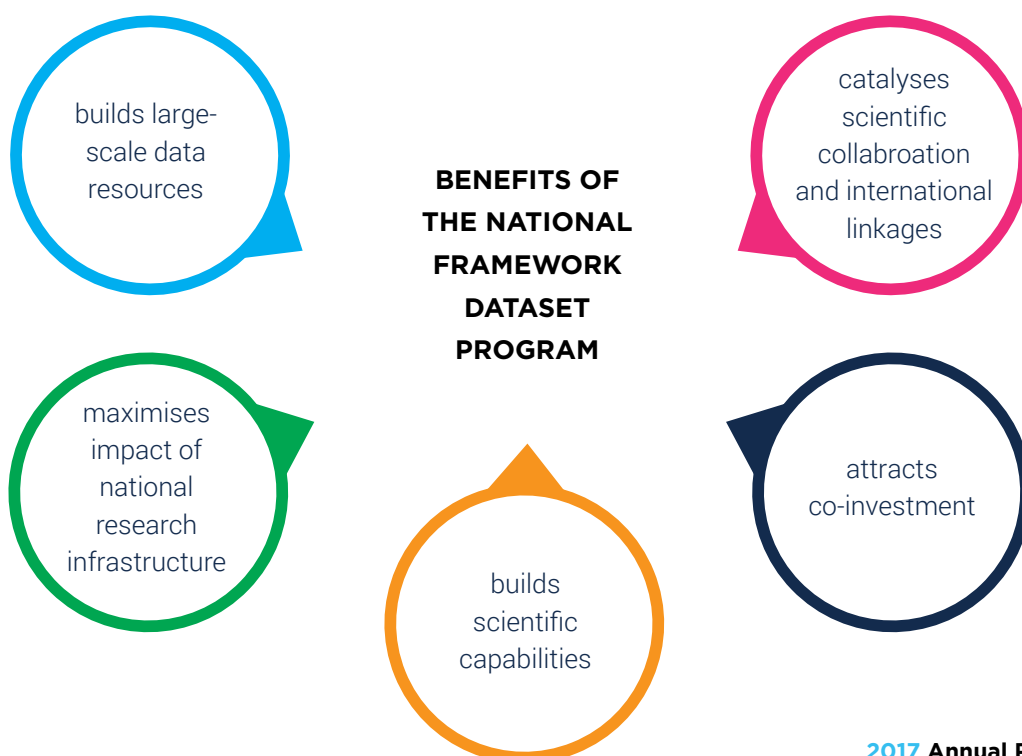
Prior to the Oz Mammals initiative, only three whole genomes were available for Australian marsupials. This year, eight marsupial species were selected for whole genome sequencing and phylogenies (evolutionary trees) are in progress for selected marsupials, rodents and bats. So far, museum specimens from 139 different marsupials and 57 rodent species have been sequenced. The work program will also extend to recently extinct species and closely related species from Indonesia, New Guinea and South America.

Completed reference genomes and phylogenies are expected to provide insights on genetic diversity and in-breeding and will be immediately useful for conservation management decisions. Even though the project is Australian-centric, the uniqueness of Australian mammals garners interest from the international research community and will enable links to a number of international organisations and projects.

Environomics: Building the genescape

Bioplatforms Australia is a co-investor in a three year, \$13 million initiative that is seeking to explore Australia's biodiversity at a genomic level. CSIRO is taking the lead in developing Environomics platforms that take advantage of faster, cheaper sequencing technologies in order to better understand the interactions of diverse species hidden within Australia's ecological landscape. The initiative aims to unlock and make use of the genetic information within the 15 million plant and animal specimens managed by National Research Collections Australia and will link with a number of our other environmentally focussed dataset projects.

Environomics, short for environmental genomics, will push the boundaries in 'omics and informatics to enable multiple species to be sequenced and analysed simultaneously. These new Environomics techniques will be transformational for agriculture and marine industries and will have a huge impact on resource management and conservation. Revealing the genetic resources of Australia's biodiversity will also enable novel materials, processes and products that will lead to new industries.



WORLD CLASS SCIENCE

In 2016/17 Bioplatforms Australia nodes were utilised and acknowledged in more than 600 research papers and received grants for over 80 different projects.

Bioplatforms Australia is constantly monitoring research outcomes to measure the capacity and capabilities of 'omics research infrastructure. It is a particular sign of success that four major genomics projects were published in the prestigious international journal, Nature, which is renowned for presenting the finest peer-reviewed research. The following findings demonstrate the quality science that can be enabled by a collaborative funding model and coordinated infrastructure investments.

Quinoa genome reveals super crop potential

Quinoa is a highly nutritious grain that thrives in conditions that are not suitable for most food crops. The grain was first cultivated by the Incas centuries ago but despite its resilience in high altitudes and poor, salty soils it has never really been developed as a crop plant.

To improve quinoa for world-wide production, an international effort involving researchers from our metabolomics node at the University of Melbourne, sequenced and assembled a high-quality reference genome. In completing the work, researchers were able to identify the gene responsible for producing a bitter-tasting chemical compound called saponins. This natural defence against birds and other pests is costly and labour-intensive to remove and often requires a lot of water. In addition, quinoa plants have small seed heads and long stalks that can collapse in a strong wind or heavy rain.

This new knowledge of quinoa DNA will enable plants to be selected for improved breeding while gene editing could also make sweeter varieties without saponins. The research will enhance global food security while also providing a useful model for studying other plants and mechanisms for abiotic tolerance.

Improving melanoma survival rates

The melanoma framework datasets supported by Bioplatforms Australia are the centrepiece of a large collaborative project that is comparing the genetic code of normal cells and melanoma tumours to identify all the mutations present. It is one of the largest research efforts ever undertaken in Australia with a national coalition of over 50 researchers and also the world's largest gene-sequencing study ever undertaken in melanoma covering nearly 500 Australian melanoma patients.


Project results presented so far in Nature are ground breaking as they show that genetic changes

in melanomas on the hands and feet (acral) and internal surfaces (mucosal) are not linked to ultraviolet radiation like skin melanoma. This finding explains why therapies for skin melanoma do not work so well for acral or mucosal melanomas. The study also showed that there are no other clear environmental causes for acral and mucosal melanoma which provides a new direction to seeking more effective treatments for patients with these types of melanoma.

Aboriginal regionalism over 50,000 years

Genomic analysis of hair samples collected from Australian Aboriginals has revealed that strong regional clusterings of Aboriginal groups persisted for up to 50,000 years before European colonisation and reflects the connection to country which is so heavily interwoven into Aboriginal culture.

In the study published in Nature, genetic analysis of mitochondrial DNA of 111 hair samples collected between the 1920s and 1970s were



sequenced by our node at the Australia Genomic Research Facility. The researchers traced back the geographic origin of each individual as far as possible using genetic analysis and ethnographic metadata to reveal that modern Aboriginal Australians are the descendants of a single founding population that arrived in Australia 50,000 years ago when Australia was still connected to New Guinea. Populations then spread rapidly between the next 1,500-2,000 years around the east and west coasts of Australia, meeting somewhere in South Australia. From this time the basic population patterns persisted for the next 50,000 years indicating that communities have remained in discrete geographical regions.

This pattern of migration is unlike any other elsewhere in the world and provides compelling support for the remarkable Aboriginal cultural connection to country.

The study was awarded the 2017 Eureka Prize for Excellence in Interdisciplinary Research and forms part of the Aboriginal Heritage Project, a large collaborative project led by the University of Adelaide and supported by Bioplatforms Australia. Outcomes of the project will make an important contribution to the Reconciliation process as it will allow people with Aboriginal heritage to trace their regional ancestry and reconstruct family genealogical history.

High-quality reference genome for barley

Australian researchers, including our node at the Centre for Comparative Genomics at Murdoch University, were involved in ten-nation consortium that published the first high-quality reference genome sequence of barley.

Barley has been used for more than 10,000 years as a staple food, animal feed and for making popular beverages such as beer and whiskey. Sequencing the barley genome has taken ten years and been a significant challenge. This is because its genome is almost twice as large as the human genome with 80 per cent of it comprising highly similar copies of repetitive elements. Bioinformatics and advances in computational algorithms were key to successfully constructing a fully ordered sequence assembly.

The barley genome sequence is now accessible to the scientific community and has revealed detailed information useful for breeding programs and for understanding malting genes. The methodological advances achieved in gene mapping will also enable other large and repeat-rich genomes to be unlocked.



INDUSTRY ENGAGEMENT

Quality science is essential for innovation and competitive industries. However, we are critically aware that industry engagement is a significant factor in translating science into economic and social benefit. Consequently, many of Bioplatforms programs and funding initiatives promote a science-industry interface as a means of transforming scientific discovery.

Our National Framework Dataset collaborations have proven to be highly effective in engaging end-users in high priority research endeavours. We also offer Industry Access Vouchers to boost innovation partnerships with a strong commercial focus.

This year we awarded six new access vouchers to support science-industry linkages. The vouchers provide commercial entities with up to \$10,000 of matched funding for any research service delivered by a Bioplatforms Australia node. A total of 18 industry based projects have received funding support under this program.

2016/17 Industry Access Voucher Awardees

Proteomics International Ltd & Monash Antibody Technologies Facility

Proteomics International (PI) is a medical technology company focused on proteomics with integrated commercial interests in diagnostics, peptide drug discovery and analytical services. PI is developing the world's first predictive diagnostic test for diabetic kidney disease called PromarkerD. It has partnered with the Monash Antibody Technologies Facility to develop an ELISA kit with five biomarker targets. The ELISA kit is a key commercialisation step toward manufacturing and licensing the PromarkerD test.

Signatag & Australian Genome Research Facility

In order to protect cash during transit in road vehicles, Signatag is exploring the potential for incorporating unique DNA barcodes into security dyes. These dyes are held in explosive pouches that detonate if opened inappropriately, marking the cash and the perpetrators. The DNA barcode system generates a unique pattern specific to each batch of dye, allowing the cash and/or marked perpetrator to be unequivocally linked to a specific robbery. AGRF has been engaged to assist with sample recovery, DNA amplification and genotype calling, and testing the inks on skin and various materials.

Feedworks Pty Ltd & Australian Proteome Analysis Facility

A pilot study on poultry nutrition aims to improve dietary strategies by quantifying the impact of varying amino acid dietary supplements. The digestion and absorption of amino acids and glucose in poultry diets is pivotal in the performance of broiler chicken and the production of chicken meat but it is the absorption, or intestinal uptakes of nutrients, that limits product performance. If the study is able to provide tangible evidence that amino acid availability at the tissue level can be manipulated, this would enable new poultry feed formulations and the use of synthetic amino acids to improve productivity within the industry.

Forensic Human Identification Pty Ltd & Australian Genome Research Facility

DNA phenotyping translates select biomarkers from a DNA sample into predictions about various physical traits. It is a technique used to aid forensic investigations when no eyewitness or other intelligence information is available to help identify a person of interest. DNA phenotyping has demonstrated significant potential in the US and this pilot study will use AGRF capabilities for DNA extraction, DNA repair and array genotyping. If successful, this work will enable a standard test-set of artificially degraded, mixed DNA standards to be developed and for DNA phenotyping services to be promoted to the Australian forensics community.

Fruit Rights Australia Inc & Australian Genome Research Facility

Fruit Rights Australia (FRA) is a representative group that aims to protect intellectual property rights for new fruit varieties developed by its members. FRA is working with AGRF to utilise DNA fingerprinting methods in determining the legitimacy of stone fruit trees. Such DNA evidence will enable FRA to effectively protect the IP rights of varietal breeders and owners.

Thinkbio Pty Ltd & Australian Genome Research Facility

The use of bacteria for promoting plant growth in agriculture is becoming increasingly important given their strong potential for improved fertiliser efficiency. However, the understanding of the soil microbiome and ability to make informed recommendations for the use of specialist inoculants is still emerging. This project aims to use 16S bacterial diversity profiling and next-generation sequencing to better understand plant growth promoting bacteria in agricultural soils in both Queensland and New South Wales and develop new knowledge of use to farmers.



PLATFORM TECHNOLOGY CAPABILITIES

The Bioplatforms Australia network provides access to genomics, proteomics, metabolomics and bioinformatics capabilities through 17 leading universities and research facilities located around Australia.

Over the last decade approximately \$75 million has been invested in high-end instrumentation and some 230 staff are funded every year. Our role as network leader ensures a coordinated investment strategy so that Australia's 'omics research capabilities are aligned with national priorities.

Genomics

High-throughput genomic technologies continue to impact every field of life science research. Our four genomics nodes offer a comprehensive suite of sequencing technologies and bioinformatics capabilities that are heavily utilised by the Australian research community. New instrumentation purchased with support of the NCRIS Agility Fund has expanded the capacity to produce high quality, large-scale genomic data.

The world-class capabilities and the scientific activities performed by our genomics nodes include:

Australian Genome Research Facility

The Australian Genome Research Facility (AGRF) offers a broad portfolio of genomics services through its national network. It services around 3,000 clients a year across all research sectors and is particularly well equipped for large-scale genotyping and massively-parallel DNA sequencing.

AGRF has significantly expanded its sequencing capacity with three new Illumina NovaSeq6000 instruments that were funded by NCRIS/ Bioplatforms Australia. In addition, linkages with the Genomics Innovation Hub (GIH) has enabled access to a 10X Genomics Chromium System and PromethION sequencing instrument. Likewise, the Integrated Genomics Facility established in partnership with the University of Queensland provides access to a HiSeq4000 instrument. As a measure of scale, AGRF can now access data generation capacity equivalent to 26,000 high quality human genomes per year.

AGRF's genomics expertise continues to be applied for diverse projects. It is actively supporting important initiatives to integrate genomics into clinical care as part of the Melbourne Genomics Health Alliance, Queensland Genomics Health Alliance, the Australian Genomics Health Alliance and the new Victorian Comprehensive Cancer Centre. Industry-based projects covered agriculture, pharmaceutical production, health care, personalised genomics, food safety, forensics, and water quality. It also sequenced mitochondrial genomes of historic hair samples for the Aboriginal Heritage

Project. This work enabled a Nature publication on ancient Aboriginal migration and the 2017 Eureka Prize for Excellence in Interdisciplinary Research.

Ramaciotti Centre for Genomics

The Ramaciotti Centre for Genomics at the University of New South Wales provides services to more than 500 research groups each year across biomedicine, agriculture, the environment, biotechnology, and food. Its comprehensive technology suite includes short- and long-read next generation sequencers, platforms for single cell analysis as well as instruments for high throughput genetic screening for population studies.

Sequencing capacity was increased during the year with the acquisition of a PacBio Sequel and an Illumina NovaSeq 6000. The addition of a 10X Genomics Chromium system has also enhanced de novo assembly and single cell capabilities. The PacBio long-read technology was used to support the Koala Genome Project which has produced the highest quality marsupial genome to date. The genome has already underpinned dozens of investigations on koala biology, conservation, and disease management and continues to be accessed for ongoing research.

Numerous industry collaborations occurred throughout the year including a project with the biotechnology company, Microbiogen. In this project yeast strains were sequenced to explore their potential in the biofuel industry. The collaboration was supported by one of our Industry Access Vouchers and offers a great example of how the vouchers can catalyse long term, independently funded research collaborations.

Biomolecular Resource Facility

The Biomolecular Resource Facility (BRF) at the Australian National University (ANU) provides next generation genome sequencing and bioinformatics capability to support the ANU's John Curtin School of Medical Research and Research School of Biology together with the CSIRO Black Mountain site. The BRF is also a significant collaborator in a number of the

Bioplatforms Australia Framework Data Initiatives.

The BRF is also involved in genomics integration initiatives and is supporting the Canberra Clinical Genomics Centre being established with funding support from the ACT Government. The Centre will sequence genomes of patients with complex diseases in order to develop personalised treatments. NATA compliance will be required for clinical screening and analysis services. A collaboration on plant biologicals was also initiated to facilitate environmental management and crop deployment utilising the new Ecogenomics and Bioinformatics Lab located at the ANU.

The BRF's genomics capabilities also support industry collaborations such as the next-generation sequencing project undertaken for Gondwana Genomics. This project seeks to rapidly identify genotype markers that can help commercial growers improve genetic gains in tree breeding.

The Kinghorn Centre for Clinical Genomics

The Kinghorn Centre for Clinical Genomics (KCCG) at the Garvan Institute of Medical Research is a purpose-built facility specialising in clinical genomics. The KCCG was one of the first organisations in the world to acquire the Illumina HiSeq X Ten instrument which provides sequencing capacity of up to 18,000 whole genomes per year.

During the year, over 15,000 whole genome sequences were completed for both Australian and international research groups in areas such as familial cardiomyopathies, mitochondrial disorders, immune deficiencies, retinal dystrophies, and intellectual disabilities.



The KCCG is very active in genomics medicine. In conjunction with its parent, the Garvan Institute, and its pathology sequencing company, Genome.

One, new collaborations have been formed with NSW Health Pathology, Sanford Health, one of the United States' largest health care companies, and the Western Australian government's Undiagnosed Diseases Program. It is also supporting Australia's first clinical genomics unit which was launched by the Garvan Institute and Weizmann Institute of Science at St Vincent's Hospital. An important international linkage has also been forged with Genomics England, instigator of a 100,000 genome project, to enable data sharing and an exchange of expertise.

On the bioinformatics front, systems for secure, centralised storage and analysis of genomic data are being developed in partnership with the National Computing Infrastructure. Meanwhile, a phenotyping software, Patient Archive, is being tested in Australia, Japan and England. The software provides a secure and searchable data storage platform for clinical and genomic information.

Proteomics

Proteomic applications are diverse and growing and provide insights in all manner of complex biological processes. Bioplatforms Australia currently supports five proteomics facilities each with their own distinctive capabilities and focus.

The scientific activities and capabilities of our proteomics nodes are world-leading and include the following:

Australian Proteome Analysis Facility

The Australian Proteome Analysis Facility (APAF) offers a broad array of proteomics services, including significant capacity in high throughput mass spectrometry, amino acid analysis, N-terminal sequencing and multiplexed ELISA. Its world leading performance in detecting and quantifying peptides from complex human cell lysates has been recently confirmed through a benchmarking study of 11 international laboratories.

Most APAF services are accessed by industry clients with 60 per cent of users coming from the agrifood and biomedicine sectors. It continues to improve its capabilities such as SWATH mass spectrometry workflows. This technique is highly useful for comparative studies and was used in a study on age-related changes in paediatric plasma proteins undertaken with the Murdoch Children's Research Institute.

Other research activities include the project with Sugar Research Australia which is investigating the causes and pathobiology associated with sugarcane yellow canopy syndrome, a disease which greatly reduces crop yields. Research collaborations in neurodegeneration, particularly motor neuron disease and Alzheimer's dementia, continued during the year along with cancer research on earlier detection biomarkers for pancreatic cancer and treatment response biomarkers in melanoma. Other biomarker research involved large-scale screening projects in pursuit of inflammatory markers related to the frailty of older Australians.

Monash University Biomedical Proteomics Facility and Antibody Technology Facility

Our two Monash University nodes provide access to advanced mass spectrometry systems for the identification, characterisation and quantification of proteins isolated from diverse sources. The Monash Antibody Technology Facility also offers specialist capabilities in producing custom-made monoclonal antibodies using high-speed robotic platforms.

The Monash Biomedical Proteomics Facility (MBPF) collaborates with more than 200 Australian and

international research organisations and industry-based partners. During the year, it established its first official node at the Monash Institute of Pharmaceutical Sciences which aims to develop new drug treatments. It is also working with the Indian Institute of Technology to identify novel strategies and drug targets for the common fungal pathogen *Candida albicans*.

To meet growing demand, three new mass spectrometers (two SCIEX 6600 TripleTOF and one SCIEX 6500 TripleQuad) have been recently acquired. New lipidomics and metabolomics analyses are also being implemented enabling comprehensive multi-omics capabilities.

Adelaide Proteomics Centre

The Adelaide Proteomics Centre (APC) at Adelaide University offers exceptional breadth and depth of proteomics instrumentation with seven mass spectrometry instruments suitable for basic proteomic services as well as experiments requiring highly sensitive and accurate technologies. The APC also offers tissue imaging mass spectrometry which is available in only a few proteomics facilities in the world.

The APC supports around 150 projects per year with services ranging from simple protein identification, characterisation and abundance profiling to tissue imaging mass spectrometry experiments involving large patient numbers. Capabilities in imaging mass spectrometry and targeted mass spectrometry are increasingly being applied to medical practice given their ability to complement assays commonly utilised in disease and diagnosis investigations.

Proteomics International

Proteomics International (PI) at the Harry Perkins Institute of Medical Research in Western Australia provides sophisticated proteomics services and expertise in developing protein biomarkers. PI is a novel private-public-partnership with dual objectives of servicing the research community with proteomics capabilities and pursuing proprietary science.

During the year, PI signed a production contract with Monash

Antibody Technologies Facility to progress commercialisation of PromarkerD, a new diagnostic for diabetic kidney disease. The Facility will produce the custom antibodies needed for a test being developed for pathology labs.

PI has introduced new pharmacokinetic and companion diagnostic testing methods for pre-clinical and clinical trials. Advanced bioanalytical testing will be undertaken for Linear Clinical to support clinical trials performed by them. These services were launched on the back of ISO certifications, including compliance with the OECD Principles of Good Laboratory Practice making PI the world's most accredited protein testing laboratory.

Metabolomics

Metabolomics involves large-scale characterisation and analysis of cell metabolites in order to understand the biology of an organism and its response to environmental stimuli. Metabolomics is integral to the suite of 'omics technologies needed for systems analysis and has been referred to as the "glue" that brings multiple 'omics efforts together.

Our five metabolomics nodes possess synergistic technologies and expertise which can be accessed through the following world-leading facilities:

The University of Melbourne

The University of Melbourne's School of BioSciences and Bio21 Institute offer broad metabolomics capabilities with particular expertise in plant, biomedical and environmental research.

Many of the metabolomics collaborations at the University involve biomarker investigations. This year, significant projects focused on Alzheimer's and Parkinson's disease, as well as aquatic pollution and coral health.

Lipidomics capabilities continue to be advanced so that the university is now able to detect over 700 lipids and is working towards 1,500. A partnership with Agilent to establish an Australia Plant Lipid facility is also underway and will embed two new mass spectrometry instruments.

A major highlight of the year was the Nature publication on the quinoa genome. The School of BioSciences utilised cutting edge imaging mass spectrometry to understand the spatial distribution of the grain's bitter saponins. Another publication also covered the development of a Laboratory Information Management Systems (LIMS) specifically tailored for metabolomics and developed in conjunction with our bioinformatics node at Murdoch University.

Australian Wine Research Institute

The Australian Wine Research Institute (AWRI) focuses on the metabolomics of agricultural products, food and beverages, and micro-organisms. The node has specialist expertise in identifying and profiling secondary metabolites and volatile compounds.

In 2016/17 the AWRI analysed 8,500 samples for researchers and clients from a broad range of industries. The number of new clients and collaborations doubled and has prompted new techniques including carbon metabolite profiling for a study of the gut microbiome. Other new methods were developed for analysing volatile plant hormones emitted from rice, targeted metabolite monitoring in engineered yeast strains, analysis of beer and cheese volatiles, and metabolite analysis in human plasma.

Murdoch University

Murdoch University's Separation Science and Metabolomics Laboratory offers ultra-high resolution analysis relevant to food safety and quality, plant and environmental metabolomics, as well as clinical and biomedical research.

During the year Murdoch University led a joint venture effort to establish the nation's first phenome hub, the Australian National Phenome Centre (ANPC). The ANPC specialises in high-throughput metabolic phenotyping particularly for population studies and involves the five WA universities, WA health research institutes and the WA health department. Partners also include the Telethon Kids Institute, the Harry Perkins Medical Research Institute, the Pawsey Supercomputing Centre in

Perth and the EPICentre at the University of New South Wales. The initiative involved instrument harmonisation with the International Phenome Centre Network so that samples run anywhere in the world will obtain the same results.

Other research collaborations included an investigation of the microplastics levels in the guts of filter feeding manta rays and whale sharks with the Marine Megafauna Foundation; determining levoglucosan as a biochemical tracer of biomass burning in Antarctic snow samples; and developing novel biochemical methods for identifying barley varieties.

University of Western Australia

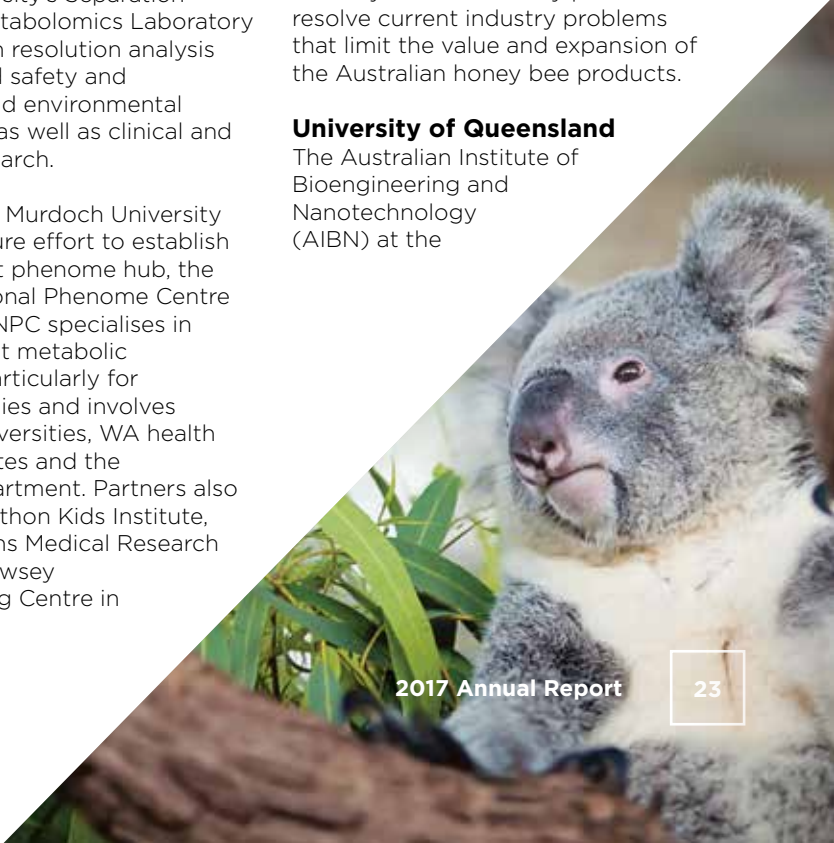
The Centre of Metabolomics at the University of Western Australia provides comprehensive analytical and data interpretation services for all areas of the life sciences.

It has been re-certified for the USA CDC (Centre for Disease Control and Prevention) Vitamin D Standardization Certification Program for the fourth year in a row. The group works collaboratively with local, national and international groups to study the effects of Vitamin D in various human populations.

The Centre of Metabolomics is also an active participant in the recently launched Cooperative Research Centre for Honey Bee Products. The CRC is working with a range of industry and community partners to resolve current industry problems that limit the value and expansion of the Australian honey bee products.

University of Queensland

The Australian Institute of Bioengineering and Nanotechnology (AIBN) at the



University of Queensland provides metabolomics services that include metabolic engineering and fluxomics modelling which can be used to analyse and engineer mammalian, plant or microbial fermentation systems.

The AIBN provides significant support to industry-based projects. Over the last year, it has been working with world leading companies in industrial biotechnology including Dow Chemicals, Pepsico, Zoetis and Lanzatech. Research projects have included the development of a viable strain for propionic acid biosynthesis which is a useful preservative and flavouring agent for the food industry. It has also helped to improve the output of vaccine production with Zoetis and developed a systems biology platform to streamline the fermentation of carbon emissions.

Bioinformatics

Bioinformatics is an enabling capability and an essential component of Australia's 'omics research infrastructure. Our nodes develop new bioinformatics methods, software tools, super-computing capabilities and e-infrastructure solutions to enhance workflows, analytical capacity and data management and storage. At the same time, bioinformatics skills are embedded into research teams through funded staff, training services and expertise.

Bioplatforms Australia's bioinformatics nodes include:

Centre for Comparative Genomics

The Centre for Comparative Genomics (CCG) at Murdoch University has specialised laboratories and expertise for bioinformatics, software development and high performance computing. It provides strategic support to our large-scale projects through the development of internet-based software applications, informatics workflows, Laboratory Information Management Systems (LIMS) and cloud storage solutions.

During the year a bioinformatics toolkit and reference dataset of viruses and viroids were developed in collaboration with the Plant Biosecurity Cooperative Research

Centre. This new capability is utilised at Post Entry Quarantine facilities and leverages a customised bioinformatics workflow environment previously developed with the support of Bioplatforms Australia. The ability to detect viral pathogens and virus-free plants in a single assay has numerous applications and ongoing R&D aims to extend its relevance to high-risk plants including grapevines, berries, citrus, prunus and solanum.

The CCG also supported our metabolomics nodes in the development of their comprehensive LIMS which captures the entire lifecycle of a sample starting from project and experiment design to sample analysis, data capture and storage. It acts as an electronic notebook, facilitating project management within a single laboratory or a multi-node collaborative environment.

Systems Biology Institute

The Systems Biology Initiative (SBI) at the University of New South Wales provides bioinformatics expertise in genomics and molecular systems biology. It collaborates widely with our 'omics partners as well as external research and industry bodies.

During the year, the SBI continued to support a project to assemble and annotate genomes of plant pathogens for a rapid diagnostic assay that can be used for quarantine purposes. The SBI was also the key bioinformatics collaborator in high-profile studies related to pathogenic *E. coli*, the discovery of synergistic antifungal drugs, and changes in gene expression that occur in the brains of schizophrenia patients.

New software and methods have been developed and released to the research community. The PTM Oracle, a Cytoscape-based application for the construction and analysis of intracellular networks has already been downloaded more than 800 times by Australian and international users.

The SBI also became the NSW-based node of the EMBL Australian Bioinformatics Resource. This has

allowed the SBI to integrate with a national framework of bioinformatics, data management, tool design and construction, and training workshops.

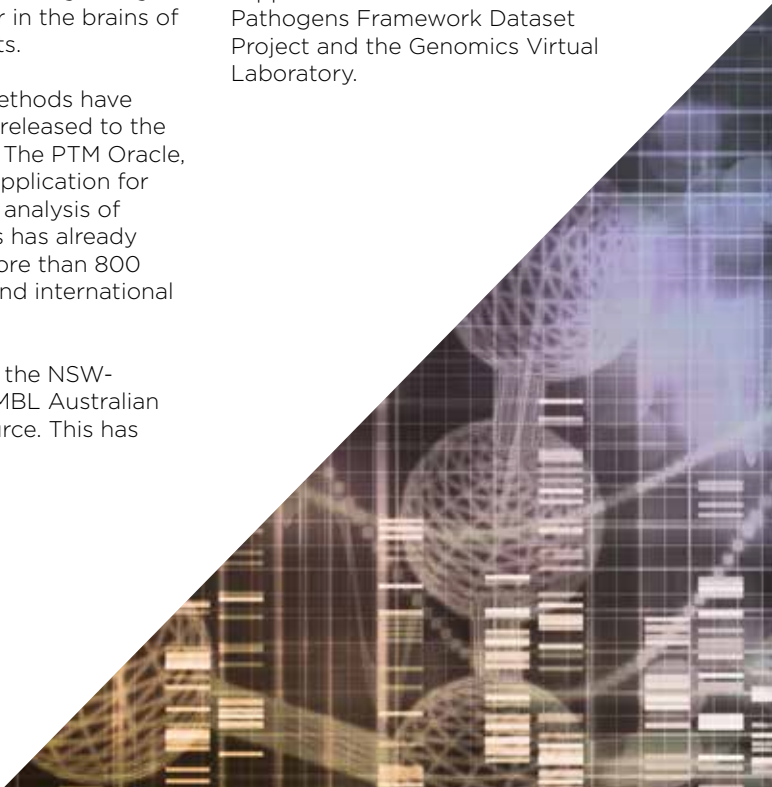
EMBL Australian Bioinformatics Resource

EMBL Australia Bioinformatics Resource (EMBL-ABR) provides national bioinformatics research infrastructure, advice and expertise. It brings together existing bioinformatics capabilities within local groups and institutions across Australia and provides coordination at a national level.

During the year, funding from Bioplatforms Australia and the University of Melbourne enabled the EMBL-ABR to establish itself as a distributed infrastructure network with an International Scientific Advisory Group (ISAG) and 11 nodes located around Australia.

Five new tools for national and international data sharing have been implemented including ToolsAU, ISA Tools, BioSharing, TeSS and Search for Training Materials. Bioinformatics workshops and communications initiatives were also launched including the first ELIXIR 'All Hands' meeting and the Data Life Cycle workshops which address the special needs of working with non-model, microorganism, medical, animal, and plant data. EMBL-ABR also launched a Galaxy Australia community group and hosted the inaugural Galaxy Australasia Conference.

EMBL-ABR also provided invaluable support to our Antibiotics Resistant Pathogens Framework Dataset Project and the Genomics Virtual Laboratory.



LEADERSHIP

Bioplatforms Australia is committed to maintaining a high standard of governance and leadership. Strategic direction and operational oversight is provided by an independent Board of Directors and supported by an Executive Management Committee that advises on platform technologies and organisational initiatives.

Board Members and Responsibilities

Bioplatforms Australia's Directors offer a wealth of experience across scientific, business and government domains. Each Director has responsibility for particular aspects of organisational strategy in addition to their fiduciary duties.

Dr Leslie Trudzik - Chairman

Les is a founding Board Member of Bioplatforms Australia and became Chairman in 2013. He is responsible for developing the organisation's performance and impact framework. He also manages liaison with Victorian and Western Australian State Governments and partners.

Dr Sue Meek - Director

Sue joined the Board in 2012 and is responsible for organisational communications and liaison with the Commonwealth government. She is Bioplatforms Australia's representative on the Great Barrier Reef Foundation 'ReFUGE' governance committee.

Dr Katherine Woodthorpe - Director

Katherine joined the Board in 2014 and is responsible for industry engagement, advising on the innovation pipeline, and provides experience to support the challenging decision making process.

Professor Peter Gray - Director

Peter was appointed to the Board to provide scientific insight and expertise to all platforms. He supports academic and industry engagement and integration with aligned NCRIS capabilities.

Executive Management Committee

The Executive Management Committee manages and advises on platform issues and operations. It is also responsible for implementing strategic initiatives, including Commonwealth funding agreements that are established with network partners.

During the year Professor Ian Smith took up the position of Proteomics Convenor in place of Professor Jeff Gorman. Ian is Pro-Vice Chancellor (Research & Research Infrastructure) at Monash University and an internationally recognised expert in protein purification and characterisation with experience in high throughput proteomic analyses.

Committee members are:

Chairman

Andrew Gilbert,
Managing Director, Bioplatforms Australia

Genomics Convenor

Professor Marc Wilkins

Proteomics Convenor

Professor Ian Smith
(Acting)

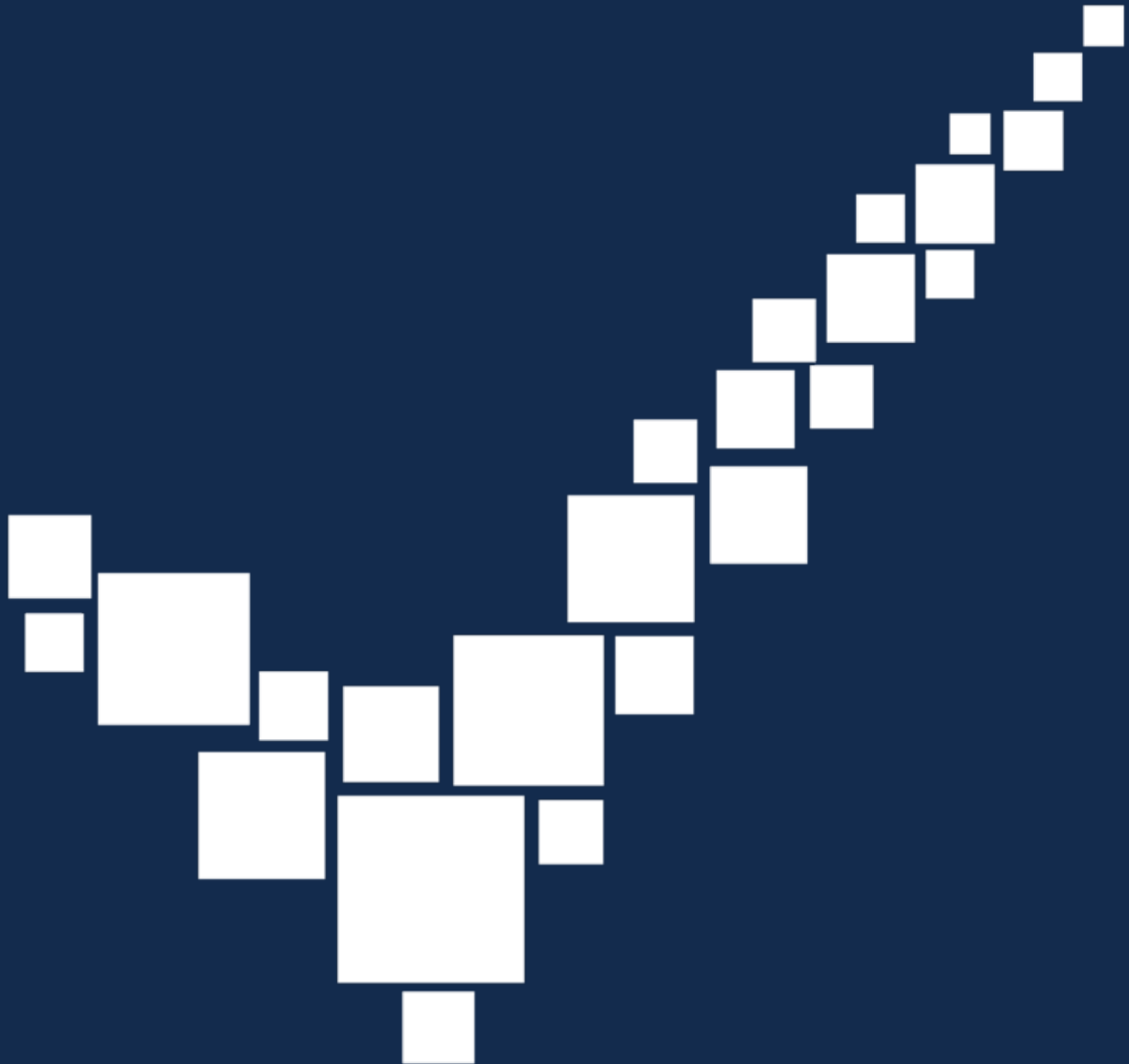
Metabolomics Convenor

Professor Tony Bacic

Bioinformatics Convenor

Professor Matthew Bellgard





BIOPLATFORMS AUSTRALIA

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Bioplatforms Australia is a non-profit organisation that supports Australian life science research by investing in state-of-the-art infrastructure and expertise in genomics,

NCRIS

National Research
Infrastructure for Australia

An Australian Government Initiative

proteomics, metabolomics and bioinformatics. Investment funding is provided by the Commonwealth Government National Collaborative Research Infrastructure Strategy.