



BIOPLATFORMS AUSTRALIA LIMITED

2007/08 REVIEW

BIOPLATFORMS AUSTRALIA WILL MAXIMISE
BENEFIT OF "OMICS" AND ASSOCIATED
INFORMATICS INFRASTRUCTURE FOR THE
AUSTRALIAN RESEARCH COMMUNITY



A MESSAGE FROM THE CHAIRMAN, MR JOHN GRANT AM

Bioplatforms Australia Limited was established in June 2007 under the National Collaborative Research Infrastructure Strategy (NCRIS) to manage a Commonwealth Government investment in the areas of Genomics, Proteomics, Metabolomics and Bioinformatics. Co-investment from NSW, Queensland, Victoria, South Australia and Western Australia State Governments together with host institutions have assisted Bioplatforms Australia partners to establish, staff, maintain and make accessible peak technology across all fields of endeavour.

Integration of the platform technologies and services on offer through Bioplatforms Australia is a key driver of the investment with a view to providing the research community with customer focused tools required for high quality, multidisciplinary research, underpinning innovation in the biotechnology sector.

The role of Bioplatforms Australia is to manage the Commonwealth's investment in accordance with the contracted Funding Agreement, oversee relevant co-investment from State Governments and Host Institutes and provide strategic advice for further research infrastructure and service initiatives and investment.

Bioplatforms Australia's first full operational year has seen major progress across all platforms, and indeed with the integration of these platforms into a cohesive and unified cross section of the Australian -omics sector. The following is a summary of the activities Bioplatforms Australia and our partners have undertaken since inception. Highlights for the 2007/08 year include:

- *Contractual arrangements completed with NCRIS funded research entities.* Completion of all sub contractual agreements with all partners across the Genomics Australia, Proteomics Australia, Metabolomics Australia and Australian Bioinformatics Facility consortia. All sub contractors completed relevant State Government funding agreements to facilitate flow of funds and initiation of activities. Bioplatforms Australia, together with State Governments and Host Institutions have invested over \$28 million in infrastructure and staff to kick start the program and facilitate customer access to national facilities.
- *Strategic Plan developed.* The development of a strategic plan aimed at directing all activities to key objectives of the Bioplatforms Australia investment, namely access to infrastructure and expertise, enhanced collaboration with the research community and integration of the platforms into a "Systems Biology" offering.
- *Scientific Advisory Committee chartered.* The establishment of a Scientific Advisory Committee, chartered with reviewing infrastructure needs of the Australian research community into the future, and providing advice to the Board of Directors on possible scientific direction for future investments. The Scientific Advisory Committee membership consists of Professor John de Jersey (Chair), Professor John Mattick, Dr Tim Littlejohn, Professor Merlyn Crossley and Professor Peter Klinken.

All investment areas have acquired and commissioned a variety of -omics infrastructure and successfully recruited expert staff to provide ongoing market responsive support to the research community in their use of the investments. This phase of the project is now largely complete and we look forward to all facilities growing their customer and collaborator base in future years.

A benchmarking study, aimed at providing data on facility usage across a variety of breakdowns (geography, research sector, research discipline) was undertaken. Future usage data will be referred back to the benchmarking study in an attempt to measure the impact of the Bioplatforms Australia investment to the research community.

Access and Pricing Policy

One of the priorities for Bioplatforms Australia over the past year has been to establish a fair and transparent access and pricing policy. The policy, detailed in the Annual Report, will be further evaluated and refined as market feedback, in the form of infrastructure usage, is collected.

Promotion

Promotional efforts have been initiated with the development of a website (www.bioplatforms.com), printed materials and attendance at various relevant forums across the country. Bioplatforms Australia and partners have supported a number of research community gatherings through the year, including sponsorship of the Australian Genome Research Facility 10 year anniversary symposium and the Victorian Systems Biology Workshop. Further promotional efforts, in the form of a consolidated presence at a variety of relevant Australian research conferences, such as ComBio and the Lorne conferences are planned for 2008/09.

Policy Advice and Advocacy

The company has been particularly active in providing advocacy for the investment to a myriad of organisations, including but not limited to the Minister of Innovation, Industry, Science and Research, relevant State Governments, Australian Academy of Science, National Innovation Review, Research Australia, NHMRC and ARC.

Themes found to be consistent through our consultative efforts were included in submissions to the NCRIS Strategic Roadmap Review, Review of National Innovation System and contribution to the white paper stemming from the Innovation review. It was pleasing to see so many of our contributions incorporated into these reviews and we look forward to further contributing to policy development and implementation in coming years.

Bioplatforms Australia Team

My appreciation goes out to my fellow Directors – Dr Les Trudzik and Professor John de Jersey – who have provided valuable insight across a range of challenges through the implementation phase.

I would also like to express my appreciation to the dedication of all of our facility leaders for the spirit, goodwill and dedication they have shown in implementing this new investment. Special thanks must go to the four platform Convenors – Dr Sue Forrest, Professor Mark Baker, Professor Tony Bacic and Professor Matthew Bellgard – who together with the General Manager and Company Secretary, Andrew Gilbert, have formed the Executive Management Committee and provided leadership across all areas of endeavour.

I look forward to another productive and enjoyable year where the research community can be further served through the activities of Bioplatforms Australia and our partners.

Yours sincerely,

Mr John Grant AM
Chairman



BIOPLATFORMS AUSTRALIA INITIATIVES

Bioplatforms Australia developed a strategic plan that outlined a pathway for the organisation to maximise output from the NCRIS investment for the betterment of the Australian research community. The plan focused on 3 major areas of strategic benefit, namely

- Enhanced access to Australian –omics infrastructure
- Increased collaborative opportunities for Australian researchers requiring access to leading scientific infrastructure
- Integration of the genomics, proteomics, metabolomics and bioinformatics platforms to provide Australian researchers with opportunities in the emerging field of Systems Biology.

A number initiatives have been developed and undertaken to achieve maximal performance against these driving principles of Bioplatforms Australia and are outlined below.



INCREASING ACCESS TO OUR NATIONAL INFRASTRUCTURE

AFFILIATE PROGRAM

Consistent with our objective of improving access for researchers to established quality research infrastructure, Bioplatforms Australia has initiated an Affiliate program to enable qualified providers of research infrastructure and customer service oriented facilities to align their operations with those established for funded subcontractors and to increase the opportunities for collaborative research.

A number of non-funded affiliates have been added to the subcontractors approved in the Commonwealth Funding Agreement. Affiliates provide complementary and/or additional capability to the NCRIS infrastructure set. Indeed the same accessibility principles required by Bioplatforms Australia subcontractors are adhered to by our affiliate partners.

For example at the University of Adelaide under the guidance of Dr Peter Hoffman a unique capability using MALDI MS to image tissue sections has been established. This capability has been added to the Proteomics Australia portfolio. To facilitate activity in the absence of NCRIS funding for this program, APAF transferred a Robotic Chemical Printer to Dr Hoffman's laboratory. It is anticipated this novel sharing of infrastructure will facilitate future investment from relevant funding agencies at the laboratory in the University of Adelaide.

The University of New South Wales has two affiliate partners, the BMSF under the guidance of Professor Michael Guilhaus and The Systems Biology Initiative, an informatics group under the stewardship of Professor Marc Wilkins. These groups work cooperatively with the other NSW based facilities to support complex research programs.

Benefits to affiliate partners include

- Promotion of the affiliate capability in line with platform capabilities.
- Web based promotion of affiliate capability on the Bioplatforms Australia site and Newsletter.
- Promotion of affiliate capability at relevant conferences/forums by platforms and Bioplatforms Australia.
- Reporting of affiliate contribution to the relevant Commonwealth bodies, such as NCRIS, ARC and NHMRC.
- Joint effort in securing funding from State, Commonwealth or other sources to allow the research community to benefit from the full capability.
- Membership of Bioplatforms Australia Ltd allowing the affiliate to vote at Annual General Meetings on issues such as Directorship of the company.

Bioplatforms Australia will continue to seek affiliate partners in an attempt to grow the accessible –omics infrastructure available to Australian researchers, foster enhanced collaboration amongst our technology providers and increase the systems biology output of the Australian research community.



ACCESS VOUCHERS

Bioplatforms Australia has initiated an Access Vouchers program to increase access for early/mid stage career scientists to established Bioplatforms Australia funded research infrastructure and services.

Bioplatforms Australia consulted the NCRIS secretariat on the appropriateness of applying discretionary funds to supporting early/mid career scientists via an access voucher mechanism. The initiative will promote take up of the shared NCRIS resources, promote cultural change towards multidisciplinary research and enhance collaboration across the –omics sector.

The recent review of the National Innovation System by Dr Terry Cutler recommended a similar mechanism to foster commercial partnership with the Australian public research investment.

Review of National Innovation Systems – Recommendation 9.5

A pilot linkage voucher system be introduced to improve innovation linkages between small and medium sized enterprises and the research community.

Venturous Australia, Dr Terry Cutler, 2008

To be guided by the Scientific Advisory Committee (SAC), in consultation with relevant funding agencies, a number of ARC and NHMRC Fellowship awardees will be chosen for financial support in the form of funded access to the facilities outlined at the end of this document.

Preference will be given to early career researchers, selected as meritorious awardees by relevant funding agencies that plan to undertake research with the following criteria

- Research focus on one or more of the National Research (Innovation) Priorities (health, environment, industry, technology)
- Usage of 2 or more of platforms on offer under Bioplatforms Australia, with all 4 platforms used over the collection of supported researchers
- Multi-institutional collaborations

Consideration will also be given to the possibility of partnering with other NCRIS capability areas that have complementary technology to Bioplatforms Australia. Some other NCRIS capability areas of interest include

- Australian Microscopy and Microanalysis Research Facility (AMMRF)
- Australian Phenomics Network
- Australian Synchrotron
- OPAL Reactor
- Biotechnology Products
- Australian Biosecurity Intelligence Network

Early Career Researchers, deemed meritorious by either the ARC or NHMRC will be selected for \$10,000 vouchers for use at laboratories of Bioplatforms Australia subcontractors and affiliates. Further financial support may be made available to those researchers who require multidisciplinary experimentation to further their projects.



SYSTEMS BIOLOGY

Bioplatforms Australia has an overriding strategic driver to integrate the infrastructure platforms into a "systems biology" offering accessible to the research community. Bioplatforms Australia is working with the Australian Wine Research Institute to undertake a Systems Biology demonstration project utilising the multidisciplinary research infrastructure and customer service capability of Bioplatforms Australia.

The development of a scientific project to demonstrate the value of outsourced and multidisciplinary research was undertaken. The project will showcase both the scientific and technical expertise available through Bioplatforms Australia and the value for researchers in accessing high-end infrastructure and expertise through shared resources such as those available at our subcontractors and affiliates.

The Australian Wine Research Institute (AWRI) has developed a proposal to build a Systems Biology skill base in Bioplatforms Australia, which will enable the integration of activities across the four platforms in this 'Capability'.

In brief, the proposal aims to collect and integrate datasets from 'omics level investigations of a wine yeast (*Saccharomyces cerevisiae*) in a model fermentation system, using resources and expertise across Bioplatforms Australia platforms and at AWRI. This will enable the development of a wine yeast Pathway/Genome Database, which will provide a rich source of information that will subsequently be mined and interrogated to build mathematical models of fermentations. Models developed from this will provide the way ahead for yeast strain development programs for industrial applications in winemaking, brewing, bioethanol production, bread making, and pharmaceutical production. Expertise and knowledge gained from this initiative will be transferable to other fields including, for example, medical and environmental research; *S. cerevisiae*, is a model organism in many areas of fundamental and applied research.

Two working groups are in place to oversee the development and execution of the Wine Yeast Systems Biology initiative, both Chaired by Dr Paul Chambers (Research Manager - Biosciences, AWRI). One, comprising representatives from each of the Bioplatforms Australia platforms, will advise on experimental design, sample preparation, data management and informatics aspects of the project. The second working group comprises scientists from AWRI with skills in, fermentation technology, winemaking, molecular biology, genomics and metabolomics. This group will advise on the design of the wine yeast fermentation system to be used, perform much of the 'wet lab' experimental work, interpret data in the context of ethanolic fermentations, and collaborate with others across Bioplatforms Australia in the development of mathematical models and algorithms of fermentations.

As a starting point AWRI has recently sequenced the genome of the wine yeast to be used for the proposed work (a manuscript describing the sequence has been published in a peer reviewed journal – FEMS Yeast Research), and is building, in the same wine yeast strain, a 'Wine Yeast Deletions Library' (i.e. a collection of about 5000 yeast strains, each with a different gene knocked out); about 1800 strains are now available, the rest will be constructed in the coming 18 months.

This work was discussed in question time on October the 8th in the South Australian Parliament. The Minister for Science and Information Economy stated

"This incredible find will be a major boost to the Australian wine industry, where South Australia, of course, is the leader. By better understanding the biology of yeast and the chemistry of wine, our wine sector will have the opportunity to innovate and to maximise its marketing potential by altering our wines to suit particular markets. The find puts our winemakers in a stronger position to manage the fermentation process and to develop wines with the right quality, character and flavour."



BIOPLATFORMS AUSTRALIA ADVOCACY

An important role of Bioplatforms Australia is to provide policy advice to Commonwealth Government on the development of Australian research infrastructure and services to Australian researchers.

Bioplatforms Australia has focused on providing the NCRIS investment with advocacy across a range of forums including Commonwealth Government, State Jurisdictions, Funding Agencies and umbrella organisations for the different sections of the research community. The following specific consultations were held

- Consistent meetings with the Commonwealth Department of Innovation, Industry, Science and Research, who manage the NCRIS program
- Advisors to Minister Carr, Mr Tim Murphy and Dr Andrew Reeves
- Dr Terry Cutler, leader of the Review of the National Innovation System and author of *Venturous Australia*
- State Government representatives from the South Australia, Victorian, NSW and Queensland Governments respectively
- CEO of the NHMRC, Professor Warwick Anderson
- CEO of the ARC, Professor Margaret Sheil
- President of the Australian Association of Medical Research Institutes (AAMRI), Professor Garry Jennings
- CEO of the Australian Academy of Science, Dr Sue Meek
- CEO of Research Australia, Ms Rebecca James
- CEO of the CRC Association, Mr Michael Hartmann

These consultations were valuable in both promoting the Bioplatforms Australia charter of accessibility, enhanced collaboration and integration, and seeking broader perspectives on the landscape of the Australian Research and Development sector. A number of common themes became evident and together with feedback from our own subcontractors we devised some submissions to relevant policy reviews, namely the NCRIS Roadmap Review and the Review of the National Innovation System. Bioplatforms Australia, on behalf of our members and subcontractors prepared submissions to these reviews. Our submissions are available upon request. The following themes were communicated

- A national infrastructure program needs to be prefaced by long term commitment to infrastructure and operational support to drive the full benefits of improved access, efficiency and superior research outcomes.
- The ongoing need to train and up skill both users of the technology and associated research communities is an issue for facilities across a variety of broad capabilities.

- Increased transparency, communication, cooperation and co-investment amongst Commonwealth agencies, States and institutions across Australia is required to minimise this duplication and yield the optimal research outcomes by redirecting duplicate infrastructure investment for more productive purposes.
- High quality research is increasingly driven by multidisciplinary approaches. Bioplatforms Australia represents a broad cross section of disciplines and would be further enhanced by integration with adjacent NCRIS capability areas such as Integrated Biological Systems, Characterisation and Biotechnology Products, together with a broadening of the bioinformatics investment.
- Ready access to soft infrastructure is often an essential element in producing quality research outcomes and access soft infrastructure such as bio-banks would add to the national research infrastructure set.

These themes, common across all of our consultations were embraced in both the NCRIS Strategic Roadmap Review Exposure Draft and *Venturous Australia*, the policy recommendation put forward by Dr Terry Cutler.

Review of National Innovation Systems – Recommendation 6.14

To ensure a sustainable research infrastructure strategy into the future, extend funding for a successor program to the National Collaborative Research Infrastructure Strategy (NCRIS) for 10 years including capital and operational support of \$150 to \$200 million per annum.

Venturous Australia, Dr Terry Cutler, 2008

Additional items, including a recommendation for Government funded access vouchers to Australian public research capacity correspond with our own initiatives to maximise performance against our charter. To ensure our plans remain current, we will continue to consult broadly – both pressing our own cause, and absorbing others thoughts in our future plans.

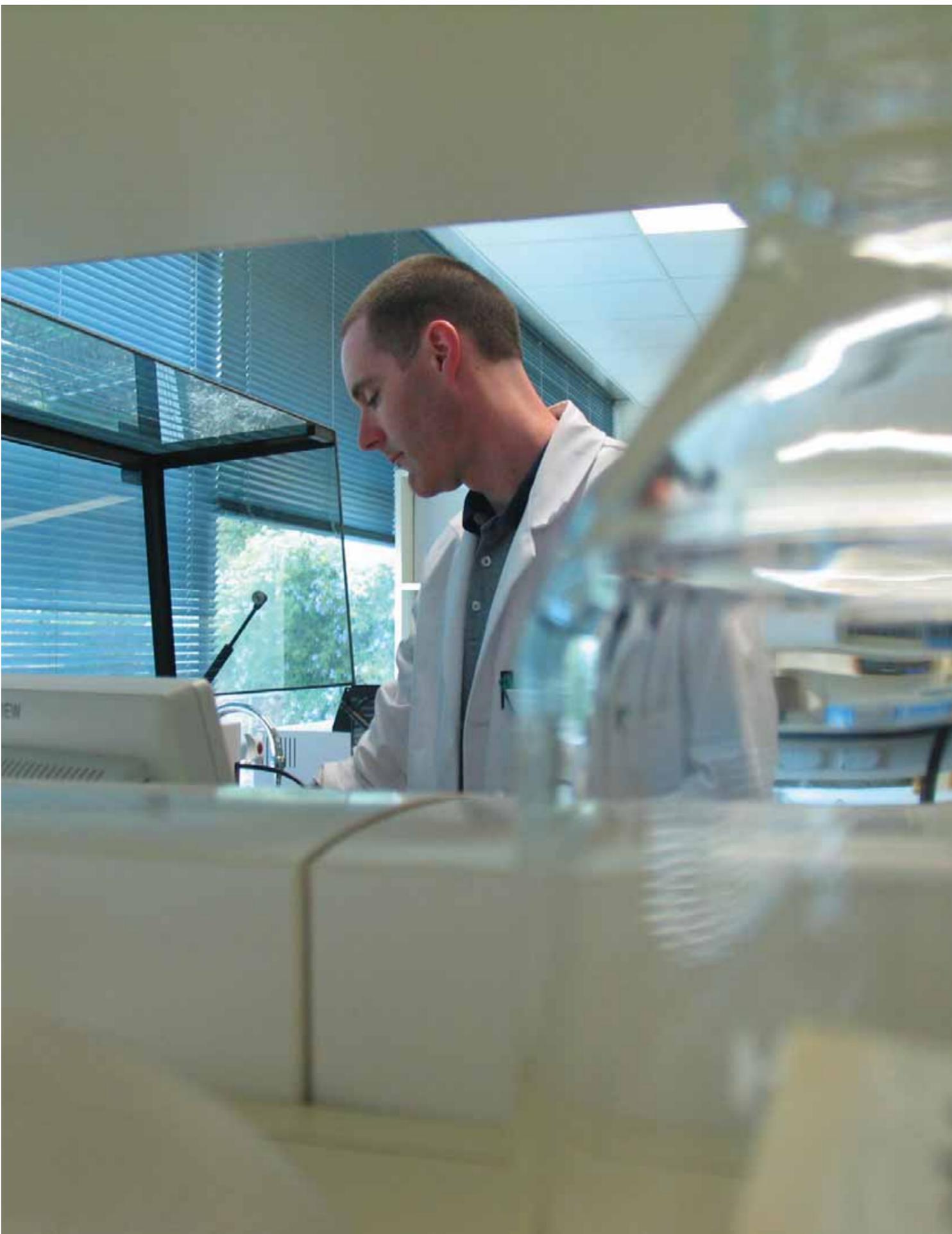


BIOPLATFORMS AUSTRALIA PLATFORM REVIEW

Bioplatforms Australia oversees a national investment across four newly formed consortia, namely

- Genomics Australia
- Proteomics Australia
- Metabolomics Australia
- Australian Bioinformatics Facility

Each of these groups co-ordinates activities across their technology sector with a view to maximising research outcomes for Australian scientists. A brief summary of each organisation is outlined overleaf.



Genomics Australia represents an alliance of a number of existing customer focused genomics capabilities around Australia, combined with the introduction of new platforms for genomic service delivery. Genomics Australia builds on the pre-existing Australian Genome Research Facility (AGRF), a not for profit company which has a state of the art national high throughput genomic service capability.

The AGRF was complemented by the transcriptomics network, that includes The Clive and Vera Ramaciotti Centre for Gene Function Analysis at UNSW, The Centre for Plant Conservation Genetics at Southern Cross University, Institute for Molecular Biosciences at the University of Queensland and WA State Agricultural Biotechnology Centre at Murdoch University.

Additionally, The John Curtin School of Medical Research at ANU, in partnership with CSIRO Plant Industry are developing new epigenomics methodologies for deployment to the national research community, whilst the Victorian Agribiosciences Centre is doing likewise in the field of gene expression microarray.

Genomics Australia recognises that the utilisation of next-generation sequencing represents a new era in genomic science both locally and globally.

Foreshadowing the changes in the next-generation sequencing market, AGRF will be expanding its current range of next-generation sequencing services via the acquisition of the illumina Genome Analyser II (GA II, utilizing Solexa technology). The GA II service, combined with the established GS FLX service, will enable the genomics research community to access a suite of scalable next-generation sequencing services spanning both long and short read lengths.

The development of long tag and short tag sequencing technologies has resulted in a range of applications leading to the generation of data previously unobtainable in such a short time. The Roche GS FLX (454) generates longer reader lengths for applications including de novo genome sequencing and re-sequencing. Applications that use short reads, but require greater sequencing depth at a lower cost, including digital gene expression and ChIP-Seq, can now be performed by AGRF using the GA II.

The expansion of AGRF's next-generation sequencing service will complement the Sanger-based sequencing service. This service, combined with our Bioinformatics capability, enables AGRF to provide the broadest range of genomic service solutions in Australia.

The Ramaciotti consortium was awarded an ARC LIEF grant of \$400,000 with additional funding from the partner institutions. This has enabled upgrading of equipment for transcriptomics analysis using the Affymetrix platform.)

UNSW provided funding in 2007/8 for an Agilent microarray platform to be located in the Ramaciotti Centre, and this is now in operation providing a service for ChIP-chip and other analyses

Technology development was undertaken in two nodes of Genomics Australia, at the VABC which examined new platforms for expression analysis and at the ANU/CSIRO node focused on sample preparation and analysis of DNA fragments in epigenomics studies.

VABC has developed new methods for genome-wide gene expression analysis including the design, fabrication and hybridisation of oligonucleotide microarrays based on the latest-generation, customizable CombiMatrix B3 semiconductor microarray technology platform.

Protocols enabling re-use of customised oligonucleotide microarrays without loss of data quality and acquisition were tested and validated.

Microarray technology platform was upgraded to establish capacity for fabrication of microarrays with a density of 90,000 oligonucleotides per chip. Design, fabrication and hybridisation of 12K microarrays for applications in functional genomics in plants and fungi was undertaken.

Access to corresponding established methodologies and CombiMatrix B3 semiconductor microarray technology platform was provided, including thorough training and demonstration via an annual systems biology workshop.

The ANU/CSIRO node has been developing a number of basic sample preparation methods. The following are now routinely available:

- Chromatin immunoprecipitation (ChIP) using antibodies to chromatin components as well as transcription factors.
- MeDIP for the detection of methylated DNA regions using antibodies to methylated cytosines
- Methyl binding protein pull down assays to detect methylated cytosines in DNA (MIRA)
- Bisulphite sequencing of methylated DNA.

All methods have been verified by using quantitative PCR or DNA sequencing for detection of known regions of the genome either in animal or plant systems.

In addition various Array based genome-wide methods and sequencing based methods are being developed.

- In collaboration with Bioinformatics Australia, ANU/CSIRO are developing analysis methods and pipelines for epigenomics sequencing data.



Proteomics Australia is a newly formed consortium of peak Proteomics service providers from around Australia with synergistic expertise. All infrastructure and expertise will be deployed around market demand and made openly accessible to Australian and international researchers from academia, publicly funded research institutes and the commercial sector alike.

Consisting of partners from The Australian Proteome Analysis Facility (APAF) at Macquarie University, Monash University Biomedical Proteomics Centre, Monash Antibody Technology Facility, QIMR Protein Discovery Centre and TGR Biosciences Pty Ltd, the new national network provides a broad range of services including traditional protein chemistry and proteomics capability through to antibody development and high throughput functional screening.

Proteomics Australia has grown the national infrastructure through complementary acquisition and commissioning of various state of the art technologies.

APAF has enhanced its biomarker discovery, throughput and quantitation capacity through the addition of a Q-Star Elite MS/MS with a focus on delivery quantitation services in the form of iTRAQ multiplexed assays. This instrument was commissioned in 2007 and is already being used to 100% capacity.

The Queensland Institute for Medical Research established a full suite of proteomics infrastructure. The new suite of technology complements APAF capability with a focus on post translational modifications of proteins. QIMR has an expertise in infectious disease which adds depth to the complementarity of the facility with other Proteomics Australia nodes.

Monash University has established the world leading Monash Antibody Technology Facility, a state of the art automated Monoclonal Antibody production facility. The throughput of the facility is ten fold greater than traditional facilities with up to 5000 antibodies able to be produced per annum. This is the highest throughput monoclonal antibody production facility in the world. The first immunisations and hybridisation took place in June and July 2008.

TGR Biosciences purchased some new liquid handling infrastructure, to assist with the roll out of up to 20 new high throughput screening kits per annum. These kits with 100 fold greater throughput than traditional Western blotting techniques are available to Australian researchers at a 30% discount off commercial rates. TGR Biosciences has also announced it will utilise the monoclonal antibody development capacity available through Monash University, providing a tangible example of facility integration.

In addition to the Proteomics Australia nodes funded through the NCRIS program, we are delighted to announce the inclusion of two new nodes under the Bioplatforms Australia affiliate program. These nodes include

- Bioanalytical Mass Spectrometry Facility, University of New South Wales which provides additional high resolution mass spectrometry with its FTIR-MS capacity. The BMSF has a long history, in partnership with APAF, in providing broad ranging services to the Australian research community. Additionally, the BMSF provides metabolomics services both locally and nationally.
- Adelaide Proteomics Centre, University of Adelaide. Dr Peter Hoffmann, Director of the Adelaide Proteomics Centre, has extensive experience in tissue imaging using MALDI MS and provides this complementary skill set to the Proteomics Australia consortium.

We look forward to engaging our new affiliate partners in the process and delivering enhanced access to proteomics capacity across the country.



Metabolomics Australia is a new national investment in infrastructure and expertise in the emerging field of Metabolomics.

The national investment in Metabolomics has provided a cross section of expertise across basic and applied science. This expertise is available to the research community through access arrangements and covers the following discipline areas

- Plant, fungal and environmental metabolomics at both Murdoch University and The University of Western Australia.
- Yeast and Wine metabolomics at the Australian Wine Research Institute in Adelaide.
- Plant, biomedical and environmental metabolomics at the School of Botany/Bio21 nodes, The University of Melbourne.
- Fluxomics through the Australian Institute for Bioengineering and Nanotechnology, The University of Queensland.

Metabolomics Australia has completed its first full year of operations. A complete suite of infrastructure has been acquired and is in the final stages of commissioning, and expert staff have been recruited to assist researchers with their experimental design, execution and interpretation.

MA offers access to a range of different GC-MS technologies (GC-quadrupole-MS, GC-TOF-MS, GC-FT-ICR-MS, GCxGC-TOF-MS) and LC-MS technologies (LC-QqQ-MS, LC-QqTOF-MS, LC-Ion Trap-MS, LC-QqTRAP, LC-FT-ICR-MS). In addition, different NMR spectrometers (up to 800MHz) can be utilized.

The following services were developed and are available to the research community:

- GC-MS based metabolite profiling
- GC-MS based metabolite quantification
- LC-MS based metabolite (eg. amino acid, organic acids etc) quantification
- LC-MS based metabolic fingerprinting
- Method developments
- Training on mass spectrometer instrumentation
- Advice for experimental setup



The Australian Bioinformatics Facility is contracted by Bioplatforms Australia to provide bioinformatics support to the –omics platforms to facilitate the provision of customer focussed research infrastructure and services to Australian researchers.

The Australian Bioinformatics Facility (ABF) works in close collaboration with the three –om platforms to enhance the bioinformatics capability within Genomics Australia, Proteomics Australia and Metabolomics Australia through provision of dedicated bioinformatics staffing and associated infrastructure.

ABF key strategic objectives are to

- Embed enhanced bioinformatics capability within Genomics Australia, Metabolomics Australia and Proteomics Australia through provision of dedicated bioinformatics staffing and associated infrastructure
- Provide overarching support for the –omics platforms through direct engagement with embedded activities and through identification and dissemination of national and international best practice in bioinformatics. The integration of data generated at each of the –omics platforms is central to the Australian Bioinformatics Facility role.

The ABF performs several essential activities for the experimental platforms and amongst other things specifically undertakes the following projects

Genomics

- Assembly, annotation, mapping, searching, non-coding RNA, disease association, comparative genomics, vaccine candidate identification, new tools for alignment, phylogenetics, visualisation

Transcriptomics

- Similarity searching and clustering, alternative splicing, annotation, gene expression and statistical analysis, Small RNA gene identification, visualisation

Proteomics

- Peptide mass fingerprinting analysis
- Custom protein datasets, visualisation

Software

- Internet based applications - via an agile approach to software development using industry best practice and employing Web 2.0 technology.
- Customisation of existing open source tools through to the development of numerous Internet based systems.

Hardware

- Linux/Unix operating systems, HPC clusters, storage area networks, network security including firewalls and hardware virtualisation.

Deployment and development of software systems - web application servers, online information management systems, grid middleware, workflow engines and relational database management systems.



BIOPATFORMS AUSTRALIA IS GENEROUSLY SUPPORTED UNDER THE NCRIS PROGRAM BY THE FOLLOWING PARTNERS



