



Empowering Australian Genomics

ANNUAL REPORT

2016/2017

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AGRF is a not-for-profit organisation, committed to quality and innovation. We actively seek to partner and share our knowledge and expertise in genomics. Through our national network, AGRF provides access to innovative and leading technologies, enabling genomics in the biomedical, agricultural and environmental domains. From single gene analysis to whole genome sequencing, AGRF provides a full range of genomic capabilities and services with complementary bioinformatics across the entire biological spectrum, to academia, healthcare and commercial industries.

AGRF improves quality of life through exceptional life science.

Our nodes are hosted by:



Our Funding Partners:

NCRIS
National Research
Infrastructure for Australia



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Chairman's Message

Professor Rob Lewis

In 2016/2017, AGRF continued delivery of its 2001 Commonwealth Government MNRF charter of providing “critical mass of quality state-of-the-art genomic services to Australia’s researchers and industry”. AGRF maintains Australia’s most comprehensive array of genomic platforms and capabilities to meet the diversified needs of the biomedical, agricultural and environmental research and industry domains. During the year, AGRF provided genomic services to >3000 clients and collaborators.

2016/2017 was an exciting year of transition for AGRF. This presented challenges that arise when implementing a change agenda as well as the opportunity to reposition the organisation to meet changing market needs and standards. It has also provided the opportunity to pursue new strategic partnering alliances in the emerging discipline of community clinical genomics.

In July 2016, the AGRF Board welcomed Dr Irene Kourtis as Managing Director. Under Irene’s leadership, AGRF successfully implemented a wide range of critical initiatives to underpin all aspects of AGRF’s growth, culture, innovation and diversification of platforms and services, operations, promotion and governance. These included the implementation of a new organisational structure to align AGRF with contemporary market needs, with increased engagement in the areas of Business and Market Development, Research Partnerships, Science and Technology, as well as AGRF’s Operational areas of People and Culture, Laboratory Services and Finance and Business Services. The recruitment of key Executives for each of these functions was supplemented by a range of new operational specialists, enhancing AGRF’s skills and competencies.

Other key initiatives included the development of AGRF’s new Strategic Plan 2017-2022, which includes planning and committing to the relocation and integration of AGRF’s corporate headquarters and Melbourne laboratories into the newly commissioned Victorian Comprehensive Cancer Centre (VCCC) and

a range of collaborative initiatives with key research partners. Details of these initiatives are presented elsewhere in this report.

It is pleasing to report the 2016/2017 financial year again delivered a positive result with both revenues and EBITDA above budget. The credit for this is due to AGRF management and staff who continued to deliver the most commendable dedication and persistence in response to the complex challenges of increasing competition, restraints and uncertainties in government funding and continued technological advances.

During the year, we welcomed Associate Professor Gabrielle Belz to the AGRF Board as a Member-nominated (WEHI) Director. Gabrielle brings valuable insight and knowledge to the Board based on her research background in Molecular Immunology. Gabrielle replaced long standing Director, Professor Doug Hilton and his formal Alternate Director Dr Julian Clark. The commitment and contributions of Doug and Julian to the Board’s deliberations and directions are highlighted and greatly appreciated. I thank my fellow Board Directors for their continued unstinting contribution and enthusiasm to AGRF’s continued success.

The continuing contribution of Bioplatforms Australia (BPA) to many of AGRF’s activities is also acknowledged and appreciated.

2017/2018 will be an exciting year for AGRF. The transitioning initiatives of the past year have well-positioned AGRF for the transformation and growth vision and agenda that we have set. The AGRF Board looks forward to working with management, staff and our research and industry clients and partners in this pursuit, with the aim of providing Australia’s leading genomic solutions across the biomedical, agricultural and environmental domains.

A handwritten signature in black ink, appearing to read 'R Lewis', with a horizontal line underneath.

Professor Rob Lewis



CEO's Message

Dr Irene Kourtis

It has been a transformational year at AGRF, with many significant achievements alongside our valued partners across academic, clinical and industry communities.

AGRF continues to be Australia's leading national genomics capability, enabling our users full access to a comprehensive range of genomic platforms and bioinformatics. We actively support genomic activity leading to the discovery, development and delivery of breakthroughs in the biomedical, agricultural and environmental spheres.

As we navigate through our twentieth year, AGRF enters a significant era of growth. The relocation of our Melbourne operations to the Victorian Comprehensive Cancer Centre (VCCC) is well underway. With building having commenced, we look forward to this move in the early part of 2018 and continued support of local and national clinical genomics activity.

Our transformation is underpinned by AGRF's 2017-2022 five year strategy, created by all staff collectively contributing their knowledge and ideas. With the Board's full support, a new Executive structure was formed to lead our teams and strategic plan. Our strategy recognises our people, their contributions and the importance of our organisational values.

As genomic technologies are rapidly evolving, creating new opportunities is essential. Building on our Genomics Innovation Hub partnership, AGRF and the University of Melbourne Centre for Cancer Research were among the first globally to receive Illumina's new NovaSeq DNA sequencing technology, paving the way towards precision medicine.

AGRF continues to work with a range of clinical partners in both the public and private sectors to enable delivery of innovative solutions for clinicians and patients. Furthermore, AGRF has applied

to expand our accreditation to ISO15189 and is developing curation capability within our clinical portfolio.

Expanding on our memberships and partnerships with the Melbourne Genomics Health Alliance and the Australian Genomics Health Alliance, AGRF joined the Queensland Genomics Health Alliance as a partner in the Genomic Testing Innovation. This work stream is aimed at integrating next-generation genomic platforms into routine clinical practice.

AGRF has a strong partnership history. We value the importance of partnering with Australian academic and industry researchers. In 2016/2017, AGRF was able to celebrate our many partnerships, including Professor Alan Cooper's Aboriginal Heritage Project, winner of the 2017 University of New South Wales Eureka Prize for Excellence in Interdisciplinary Scientific Research and a co-authored Nature publication. AGRF's ongoing partnership with the University of Queensland (UQ) was strengthened through the formation of the Integrated Genomics Facility, jointly boosting the genomic capability and capacity available to the UQ community.

To achieve our goals, we strongly value and rely on the support of the broader genomics community and from our funding partners, the National Collaboration Research Infrastructure Scheme and Bioplatforms Australia. We would like to thank our supporters in sharing our success.

I thank our Board of Directors, for their ongoing commitment and expertise to guide the success of our organisation. Thank you to the entire AGRF team for your continued dedication and enthusiasm, as our success is attributed to your commitment and efforts.

Dr Irene Kourtis

Shaping Our Future



As we approach our twentieth year, AGRF enters a significant era of “growth through transformation.” With full support from the AGRF Board, a number of strategic initiatives commenced in 2016/2017.

AGRF looks forward to the co-location of our Melbourne laboratories and executive offices to Level 13 of the Victorian Comprehensive Cancer Centre (VCCC). This transformational move will ensure AGRF continues its active leadership and support of local and national clinical genomic activity, as well as the Melbourne Biomedical Precinct. With assistance from the Department of Health and Human Services and our Parkville partners, we have formalised our tenancy at the VCCC and we have begun this significant building project, due to be completed in early 2018.

In a series of facilitated strategic workshops, all staff across Australia came together to share experiences and ideas on how to become the partner of choice in the Australian genomics community.

Our collective contributions informed the creation of AGRF’s five-year strategy.

Together we look forward to being:

- the preferred genomic service provider in our chosen markets
- the undisputed leader in customer care across our growing customer base
- a workplace of choice for employees
- an emerging leader in clinical genomics and applied commercial genomics
- predominantly and sustainably self-funded
- a desired and integral part of the research community

As part of this activity, staff applied their collective artistic talents to create a visual depiction of what the ideal AGRF would look like in 2022. The following captures the attributes required to drive and secure the ideal AGRF.

To support our strategic imperatives, together we revisited our values and behaviours and the manner in which we engage with others, deliver quality outcomes, and lead by example to drive our individual and collective success.

The Ideal AGRF in 2022



With collaboration and partnerships at our centre, AGRF continues to deliver leading customer care.

The yellow represents communication, the green represents AGRF as the workplace of choice, the blue represents clinical genomics and allied services, and the red represents financial sustainability.



Back Row: Kirby Siemering, Stephan Scheffer
Front Row: Maria Ricci, Irene Kourtis (CEO), Karen Jenkins and John R. Stephen.

AGRF Executive Team

In 2017, a new Executive Structure was created to lead our teams and our strategic plan and to increase AGRF's business competitiveness and delivery to our collaborators and clients.

Key positions and roles are:

1. Executive 'Research Partnerships', to continue our support of and commitment to the research community and to raise AGRF's profile and presence as an integral and active partner.
2. Executive 'People & Culture', to lead AGRF's Human Resources strategy, to support our staff and the 'One AGRF' culture, to support organisational development, and to improve and implement processes needed to support the attraction, retention and management of staff.
3. Executive 'Business & Market Development', to drive business opportunities in the clinical, applied, and commercial sectors, and lead the Sales and Marketing team.
4. Executive 'Laboratory Operations', to lead the day-to-day operation of AGRF service provisions, including customer care and quality.
5. Executive 'Science & Technology', to lead innovation and access to new technologies across the organisation and our valued clients.
6. Executive 'Finance & Business Services', to lead AGRF's financial activities and governance, information technology and procurement sections.

Our Vision

To be a key enabler
of world-class
genomic science.

Our Mission

To provide Australia with a world standard, research integrated capability, delivering genomic solutions to the biomedical, agricultural and environmental sectors to address key scientific questions.

Innovation

We embrace genomic challenges with curiosity, novel approaches and world class technologies.

Integrity

We always act in the best interests of our stakeholders and AGRF as a whole.

Collaboration & Teamwork

We build inclusive and valued relationships in pursuit of shared goals.

Client Focused

We are committed to delivering exceptional services, all of the time.

Our Values

Respect

We honour individuality and appreciate our working relationships.

Excellence

We are proud of our relentless quest to be outstanding in everything we do.

Operational Snapshot

362,990,576,497

NGS reads from 55,196 FastQ files

420,306

Sanger sequencing and other capillary analyses

118,228

Genotypes generated

23,974

DNA extractions

30,091

NGS libraries ran

17,045

NGS libraries constructed

7,265

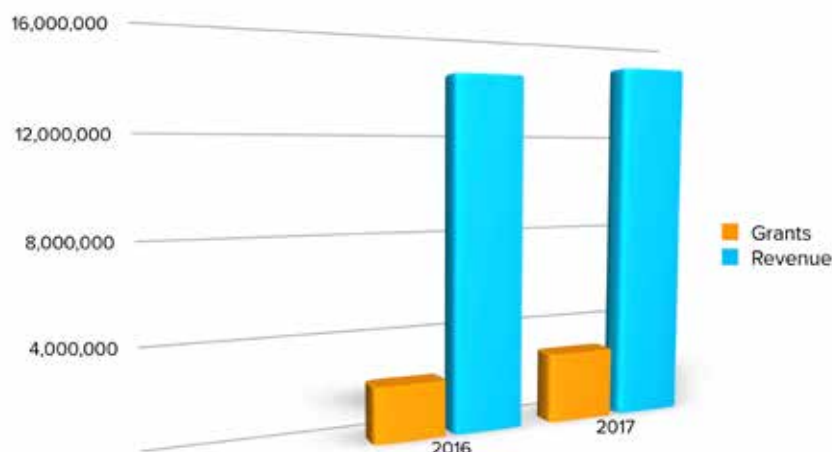
Microbiomes analysed

7,159

Samples processed in Illumina Genotyping Arrays

1,630

Samples identified by DNA fingerprinting



We seek to partner, support and serve.

Our Business Model is based on full cost recovery. Our service fees include reagents, staff time, instrument maintenance and operational infrastructure. This allows AGRF to continue to support the Australian scientific community as an independent entity. All revenues are reinvested into the community, our facilities, technology and expertise to offer leading edge support of the highest standard.

2016/2017 at a Glance

Our People

At AGRF, we value staff contributions and we know that it is only through our people that our goals will be achieved. Excellence in service delivery, communication, research and innovation requires outstanding staff. We have confidence in our leadership and in the talents of the AGRF team to take us into the future.

Workplace Diversity

We believe that a diverse workplace is essential for success. We are committed to creating and maintaining a workplace that reflects the diversity of the clients and communities that we support.



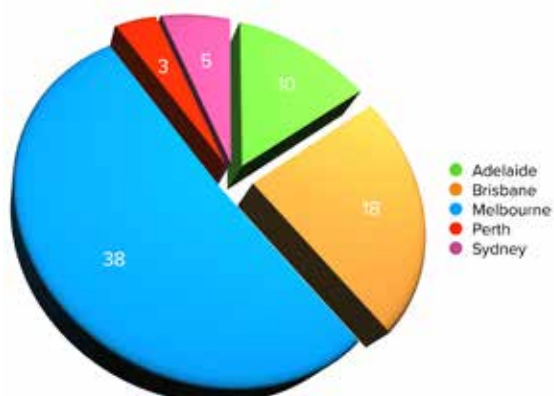
74 Staff

Female - 41

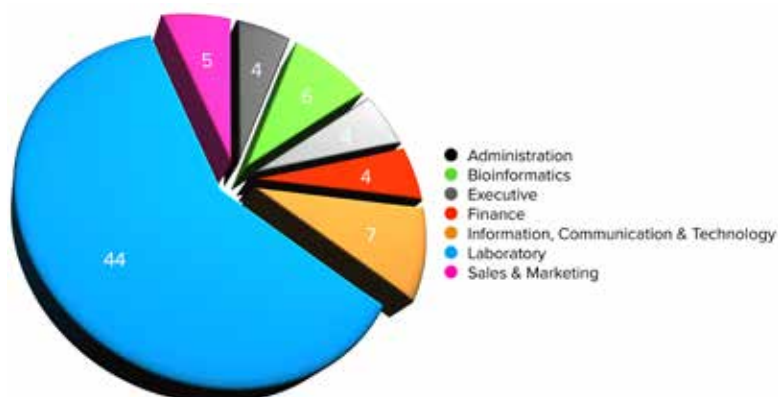
Male - 33

18 staff members
have worked at AGRF
for at least 10 years

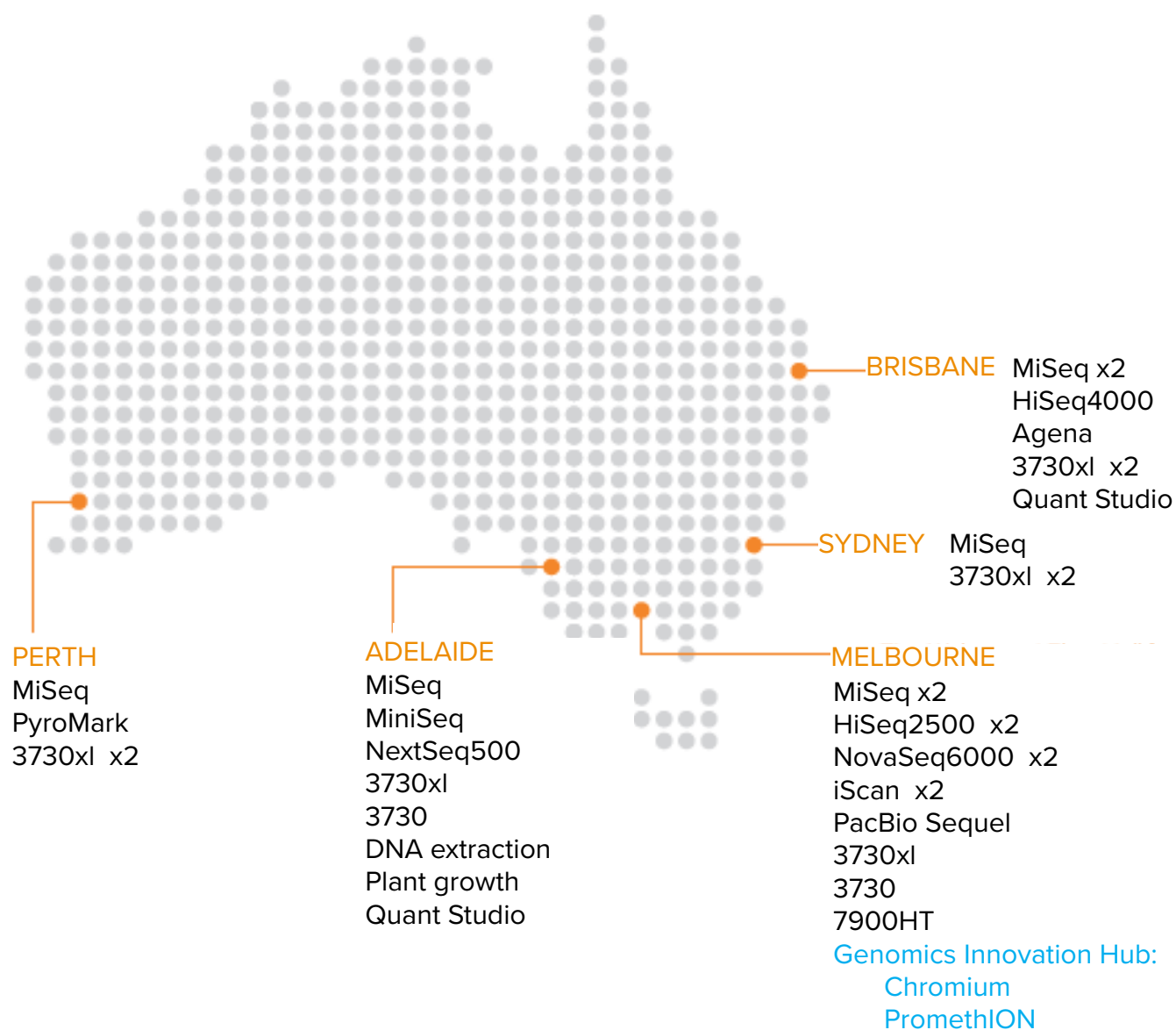
Staff by Node



Staff by Position



Leading Excellence in Instrumentation



Innovation & Development

Genomic technologies are rapidly evolving, creating new opportunities in research. To realise these opportunities, early access to cutting-edge technologies and the ability to develop innovative methods and applications is a crucial source of competitive advantage globally.

To remain agile and responsive to the needs of the research community, AGRF's Innovation & Development team actively collaborates with researchers and technology companies to develop and deploy new technologies and services.

Genomics Innovation Hub

The increasing scale and pace of technology change in genomics requires a coordinated and collaborative approach between researchers, technologists, bioinformaticians and industry.

In 2016, AGRF founded the Genomics Innovation Hub (GIH) in partnership with the University of Melbourne Centre for Cancer Research, the Peter MacCallum Cancer Centre, the Walter and Eliza Hall Institute of Medical Research, and the Murdoch Children's Research Institute.

GIH is a collaboration to bring together the critical mass of resources necessary to acquire, test, develop, and provide access to cutting-edge genomic technologies, addressing high priority research needs.

In the past year, GIH has completed more than 20 projects in the exciting area of single cell genomics. Collaborative projects have been carried out with all

GIH members as well as other organisations nationally. Projects have involved a diverse range of sample types, including cancer biopsies, organoids, retinal cells, and plant leaf cells.

GIH will enable us to share research, expertise and resources in a way that no single institution can do in isolation.
- Dr Kirby Siemering
Executive, Science & Technology, AGRF

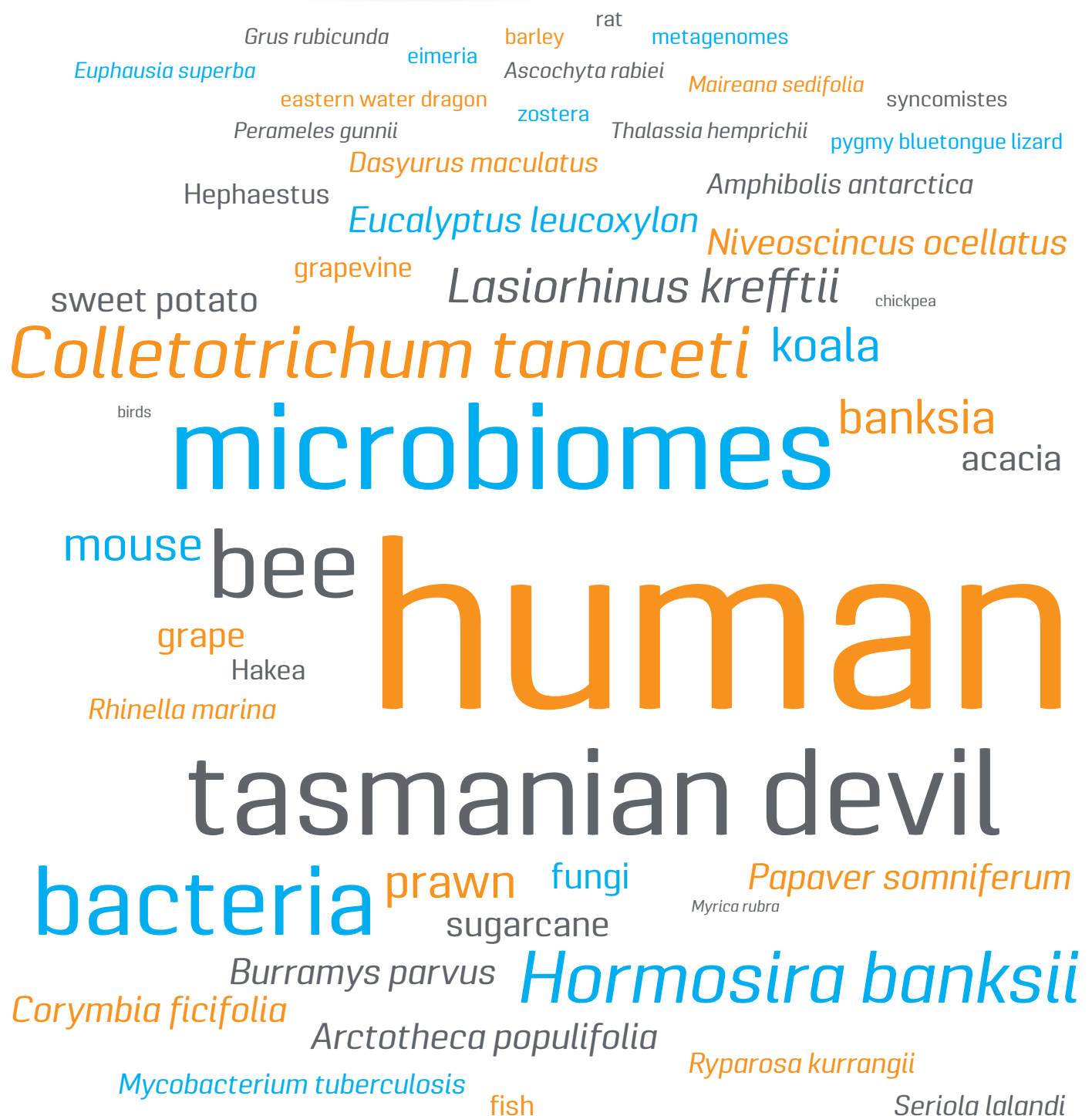
Other GIH interests have been in the area of de-novo genome assembly from prawns to grapevine genomes.

The coming year promises to be an exciting one for the GIH with a dedicated Senior Scientist joining the team, supported by BPA funding. A new GIH website is in development, and several new technologies and activities are in progress.



Dr Jafar Jabbari,
Senior Scientist

Samples at a Glance



We have used a WORDCLOUD here to visually represent the various samples that we have analysed over the 2016-2017 year. The size of the word indicates its frequency. For reference, we analysed more than 26,000 human samples.

Clinical Genomics

Advances in genomics are revolutionising the detection, diagnosis and treatment of disease, paving the way towards precision medicine.

AGRF continues to work with a range of clinical partners in both the public and private sectors to enable delivery of innovative solutions for clinicians and patients.

With a 20-year track record in genomic technologies, advanced bioinformatics, and service delivery, combined with internationally-recognised quality accreditations, AGRF specialises in delivering data to clinical partners to meet rigorous regulatory requirements.

AGRF is constantly monitoring the regulatory environment and this year applied to expand our accreditation to ISO15189: Medical Testing Laboratories to maintain compliance and support our clinical partners.

AGRF continues to contribute our expertise and resources to the national genomic healthcare agenda through our membership and partnerships with the Melbourne Genomics Health Alliance and the Australian

Genomics Health Alliance. This year also saw the establishment of the Queensland Genomics Health Alliance, where AGRF is a partner in the Genomic Testing Innovation Workstream aimed at integrating next-generation genomic platforms into routine clinical practice.

AGRF actively contributes to these various initiatives through committees and advisory groups as well as via direct participation in clinical projects such as the Melbourne Genomics Health Alliance Immunology Project. This project aims to provide more accurate diagnoses and treatment for adults and children with defects in their immune systems.

Other exciting clinical projects are due to begin next year, including provision of genomic testing for adults and children with genetic kidney disease, adolescent and adult patients with complex neurological and neurodegenerative disease, and screening for patients at high risk of developing melanoma.



Spotlight on Melanie O'Keefe

Melanie O'Keefe joined AGRF in 1997, as one of our first staff members. Melanie began her time at AGRF as a Sanger Sequencing Technician and, over time, underwent training to become the AGRF Quality Manager. In her role as Quality Manager, Melanie works closely with AGRF staff and with the Australian accreditation bodies. This work ensures that we meet the requirements of the Standards, such as the validity of the methods used to provide our Clinical Sequencing Services.

"The role allows me to work with everyone at AGRF, from the finance team through to the laboratory technicians. We work to fulfil the requirements of the AGRF Quality Management System and the accreditation bodies," she says.

As part of AGRF's commitment to our clinical partners and clients, we are developing Curation capacity within our Clinical Genomics portfolio. With a background in Genetics, Psychology, Biotechnology and Business, Melanie says she "loves to keep learning" and is looking forward to her Curation Scientist training. "It will enable me to interpret the sequencing data that we generate, and transform it into information that is relevant to a patient's clinical presentation," she explains.

Melanie has always had an interest in human genetics, particularly in regards to inherited diseases and the effects they can have on families.



Melanie O'Keefe,
Quality Manager

I love working at AGRF, particularly the people and also the opportunities it affords me, to be involved in exciting advances in genomic science.

As a leader in the early adoption of technologies, AGRF is at the forefront of what is possible and we are contributing to cutting-edge research that scientists are undertaking every day to achieve key discoveries.

- Melanie O'Keefe
Quality Manager, AGRF

Leaders in Innovation

NovaSeq6000

Building on our Genomics Innovation Hub partnership to provide Australia with access to world leading genomic technology, AGRF and the University of Melbourne Centre for Cancer Research were among the first globally to receive and deploy Illumina's new NovaSeq DNA sequencing technology.

Sequencing of the first human genome took 13 years, at a cost in excess of \$2billion. Today, our new NovaSeq technology represents the state-of-the-art in high-throughput production sequencing. Coupled with the latest computing solutions, each NovaSeq6000 has the capacity to sequence more than 50 human genomes in less than 2 days.

Given this scale, this platform enables the detection, diagnosis and treatment of cancer and rare genetic diseases, improvement of livestock and crops, and monitoring of our environment through rapid and efficient genome analysis.



The acquisition of NovaSeq technology delivers on AGRF's commitment to leading innovation and supporting world class Australian genomic science.

Importantly, the collaborative relationship with the University of Melbourne and the other Genomics Innovation Hub partners will help advance Australia's place at the forefront of medical research and patient care.

- Dr Irene Kourtis
CEO, AGRF

Funded with assistance from the National Collaboration Research Infrastructure Scheme (NCRIS) Agility Fund secured through the support of Bioplatforms Australia (BPA), this technology will greatly enable state and national initiatives in genomic health.

GB per Sample

Our qualified team has achieved

140

against a spec of 100

Q30 Scores

in the hands of our experts, achieved

92%

average, against a spec of 75%

RNA-SEQ

Our exceptional NGS team averages

>4.2B reads

against a spec of 2.8-3.3 billion read pairs

Data above correct as of 01 October, 2017.

Commercial Impact

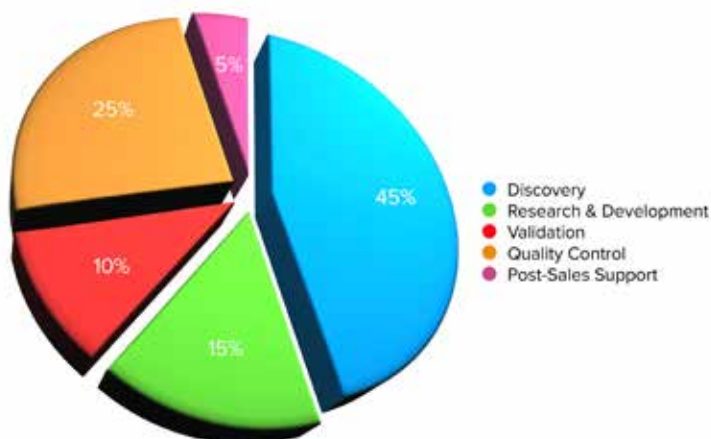
Genomics and related biosciences are advancing at an extraordinary pace as new discoveries are made that enable the development of innovative products and services. As a consequence, the emergence of new applications for genomic technology are driving productivity, product commercialisation and commercial competitiveness. AGRF are proud to support these commercial endeavours.

Supporting Commercial Clients



By facilitating access to innovative technology, expertise and comprehensive support, we've supported industries throughout the entire innovation pipeline, translating new knowledge and techniques into applied outcomes.

Supporting the Commercial Innovation Pipeline



From discovery to delivery, our services have led to new biomarker discoveries, the development of novel assays, and the delivery of innovative genomic assays.

Enabling Genomics, from Discovery to Delivery

Discovery

Genomic techniques are used to discover biological markers that can lead to new developments, including therapeutic or diagnostic products.

Development

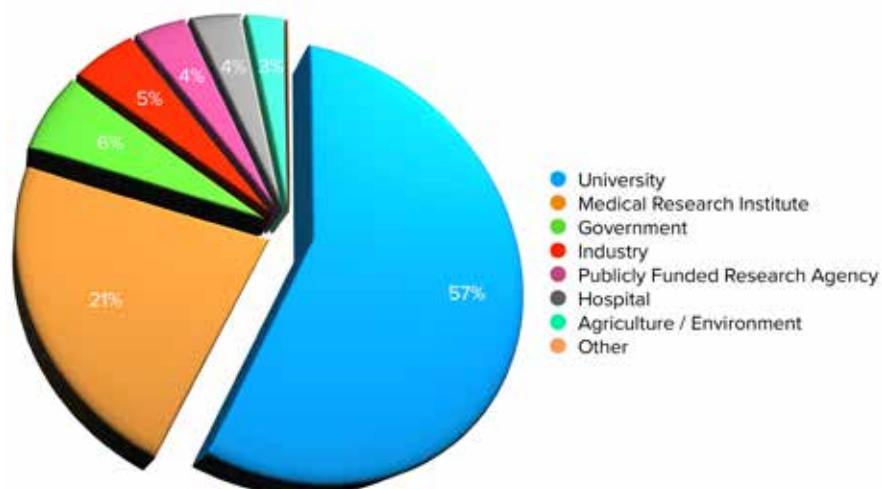
We help design, develop, validate and implement novel assays for a broad range of applications, such as pharmaceuticals, pathology, agriculture and horticulture, genetic testing and forensics.

Delivery

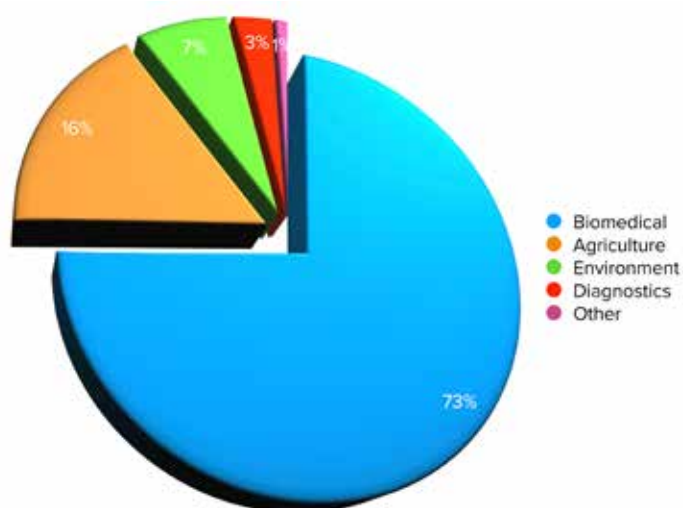
A reliable, commercially savvy provider of pre-designed assays in business-to-business contracts to support broader client functions.

Our Clients & Their Stories

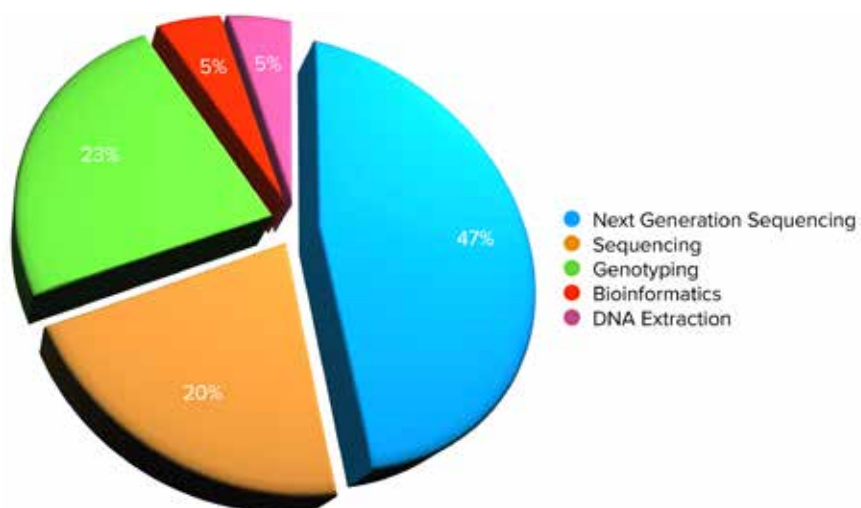
AGRF Clients
2016 - 2017



AGRF Clients by Category
2016 - 2017



AGRF Usage by Sections
2016 - 2017



Viruses in Honeybees



© desleyjane pictures

Dr Emily Remnant from the University of Sydney, published her work on the viruses that infect honeybees. Dr Remnant commends “AGRF’s fabulous services.” Her work focused on pathogenic and novel viruses spread by the parasitic Varroa mites, responsible for colony losses in honey bee populations.

“Understanding the diversity and consequences of viruses present in honeybees is critical to maintain pollinator health and manage the spread of disease,” she says.

Dr Remnant used AGRF’s services to characterise seven new viruses, and the antiviral response in honeybees. AGRF performed deep sequencing of total RNA transcriptomes and small RNA populations in honeybees and mites on the Illumina HiSeq2500.

The Giant Australian Cuttlefish

Professor Steve Donnellan and Dr Terry Bertozzi at the South Australia Museum are working to understand this fascinating species in an effort to ensure their survival. They believe there may be two distinct species that differ mainly in mating patterns and tolerance to varying salinity levels in their environments.

The Giant Australian Cuttlefish genome is almost twice the size of the human genome (5GB compared with 3GB for the human). Due to its size, assembly of the genome data is very complex and requires significant computing power.

AGRF partnered with the South Australia Museum to add a significant amount of novel, long-read sequencing data and assembly to the Cuttlefish genome, using Oxford Nanopore Technologies’ MinION platform.

It is through the efforts of genome sequencing that scientists will understand the differences between the species – the level of gene flow, understanding their mating differences, how one species adapted to higher salinity levels, how long ago these two species diverged, and understanding the differences in how they use their camouflage proteins.



© Fred Bavendam

Genomics & Technology

Optimising Drug Discovery

High-throughput sequencing technologies and characterisation of expressed human genes have created new opportunities for drug discovery.

Dr Michael Wilson, Head of Molecular Biology at CSL, leads drug development project teams for a range of disease indications including inflammatory conditions, airway disease and oncology.

Dr Wilson says, “The power of gene sequencing and analysis means we are able to define patient populations genetically to improve outcomes by predicting individual responses to drugs”.

It becomes more than just receiving data. It is the expertise that comes with it. For us it is most important that we work with people we trust.

- Dr Michael Wilson
CSL

Dr Wilson and his team recently worked with AGRF to understand antibody repertoire through sequencing analysis.

This collaborative approach transitioned methodologies from microarray to RNA sequencing, a project that required regular communication and a great deal of advice.

Dr Wilson says, “Having easy access to a genomic provider was a key factor in our decision-making. Having access to high quality sequencing and capability just around the corner is something we really value.”



Developing Quality Control for Forensic Applications

Sanax Medical, an Australian provider of forensic sampling kits, wanted to reassure their clients, providing them with the confidence that trace DNA in their kits would not compromise forensic investigations and evidence.

Working closely with Dr. David Chandler at the AGRF Perth node, a method was designed to detect the presence of DNA. The method allows trace DNA to be compared against known DNA from Sanax technicians, providing quality control in the handling methodology and production pipeline.

The collaboration with AGRF made it possible for Sanax to become certified to the Australian standard, which was granted to Sanax in March 2016.

We really wanted to be an early-mover and take this technology further, but we needed a commercially savvy genomics partner that could fulfill the commercial needs of our business.

We needed reliable reporting, turnaround times that met our production schedule, quality accreditation, as well as a group that could provide technological knowledge and advice to create the method.

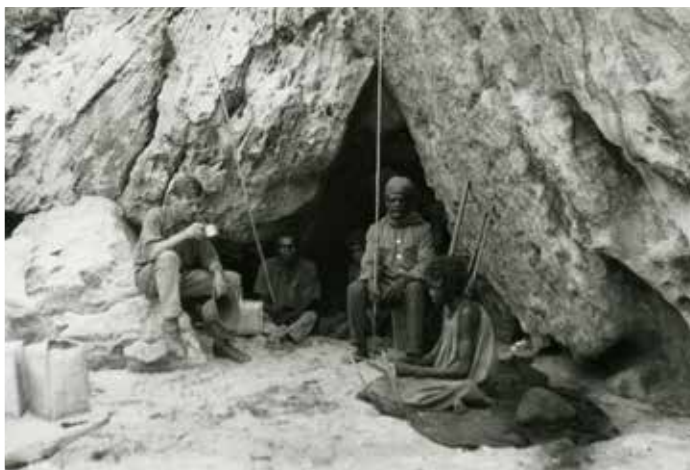
- Gavin McKay
Director, Sanax Medical

Partnerships Spotlight - Aboriginal Heritage Project

Winner of the 2017 University of New South Wales Eureka Prize for Excellence in Interdisciplinary Scientific Research, the Aboriginal Heritage Project is helping to map Australia's first 50,000 years, using DNA analysis of hair samples, together with extensive cultural and genealogical data.

The results of this study have been published in Nature¹ and the article is currently among the top 9% of all Nature papers. The findings show that modern Aboriginal Australians are descended from a single founding population that arrived in northern Australia around 50,000 years ago, while Australia was still connected to New Guinea. Populations then spread rapidly around the east and west coasts of Australia, eventually reaching South Australia around 49,000 to 45,000 years ago.

Researchers analysed mitochondrial DNA from 111 hair samples that were collected during a series of anthropological expeditions across Australia from 1928 to the 1970s.



Anthropological field trip, Dr Norman Tindale (1927).
Photo courtesy of South Australian Museum Archives
Tindale Collection (AA 338/5/4/41)

Having a close relationship with AGRF allowed for seamless sample and data transfers, minimising delays.

AGRF understood the historic value of the museum collection and the work we proposed to carry out from the beginning.

- Professor Alan Cooper
University of Adelaide

Analysis allowed the scientists to produce detailed reconstructions of the genetic and historical relationships among Aboriginal Australian groups prior to European settlement.

This research allows people with Aboriginal heritage to trace their regional ancestry and reconstruct their family genealogical history, including the displaced and stolen generations and their descendants. This is the first phase of this exciting 10-year project.

The Aboriginal Heritage Project was funded via an ARC Linkage grant. AGRF is a Partner organisation.



agrf

Congratulations!

WINNER: Professor Alan Cooper
Uni of Adelaide Centre for Ancient DNA

AGRF CEO: Dr Irene Kourtis
AGRF EXECUTIVE: Dr John Stephen

¹Tobler et al, 2017. Aboriginal mitogenomes reveal 50,000 years of regionalism in Australia. Nature, 544, 180-184.

Key Partnerships

AGRF & The University of Queensland Integrated Genomics Facility

AGRF strengthened our ongoing partnership with the University of Queensland (UQ) through the formation of a UQ/AGRF Integrated Genomics Facility (IGF), announced in January 2017.

The IGF co-locates UQ and AGRF genomic infrastructure at AGRF's Brisbane node, improving access to genomic resources for both UQ and non-UQ researchers.

Several instruments have been integrated into the IGF, including a high-throughput Illumina HiSeq4000 sequencing platform, capable of characterising more than 100 human exome samples each week.

AGRF CEO, Dr Irene Kourtis, said the collaboration helped create a focal point for future infrastructure and research funding.

"This is an exciting new partnership with UQ to jointly boost the genomic capability and capacity that is available to the UQ community. AGRF looks forward to supporting UQ's world-leading genomic research programs," she said.

Deputy Vice-Chancellor (Research) Professor Robyn Ward said the IGF would provide a range of enhanced services to UQ researchers using genomics to solve some of the world's toughest problems.

"The facility is available for a broad range of research at UQ, such as genetic models of disease development, stem cell biology, regenerative medicine and drug discovery," she said.

In addition to consolidating genomic capability in Queensland, UQ and AGRF are working towards developing an innovation incubator to investigate novel multidisciplinary technologies and methodologies.

This collaborative effort with AGRF will make it easier for UQ researchers to access the latest innovations, and work at the leading edge of genomics research.

- Dr. Irene Kourtis
CEO, AGRF



Dr Irene Kourtis, AGRF CEO
& Professor David Burt, UQ



Rachel Kliese (AGRF Qld), Dr Janette Edson
(UQ), Dr Ken McGrath (AGRF Qld)

AGRF & The University of Melbourne Centre for Cancer Research

In June 2017, AGRF and the University of Melbourne Centre for Cancer Research (UMCCR) established a state-of-the-art genome sequencing facility to be located at the new Victorian Comprehensive Cancer Centre (VCCC).

Through AGRF's and UMCCR's continuing Genomics Innovation Hub partnership, providing Australia with access to world-leading genomic technology, the partners were amongst the first globally to deploy Illumina's new NovaSeq DNA sequencing technology.

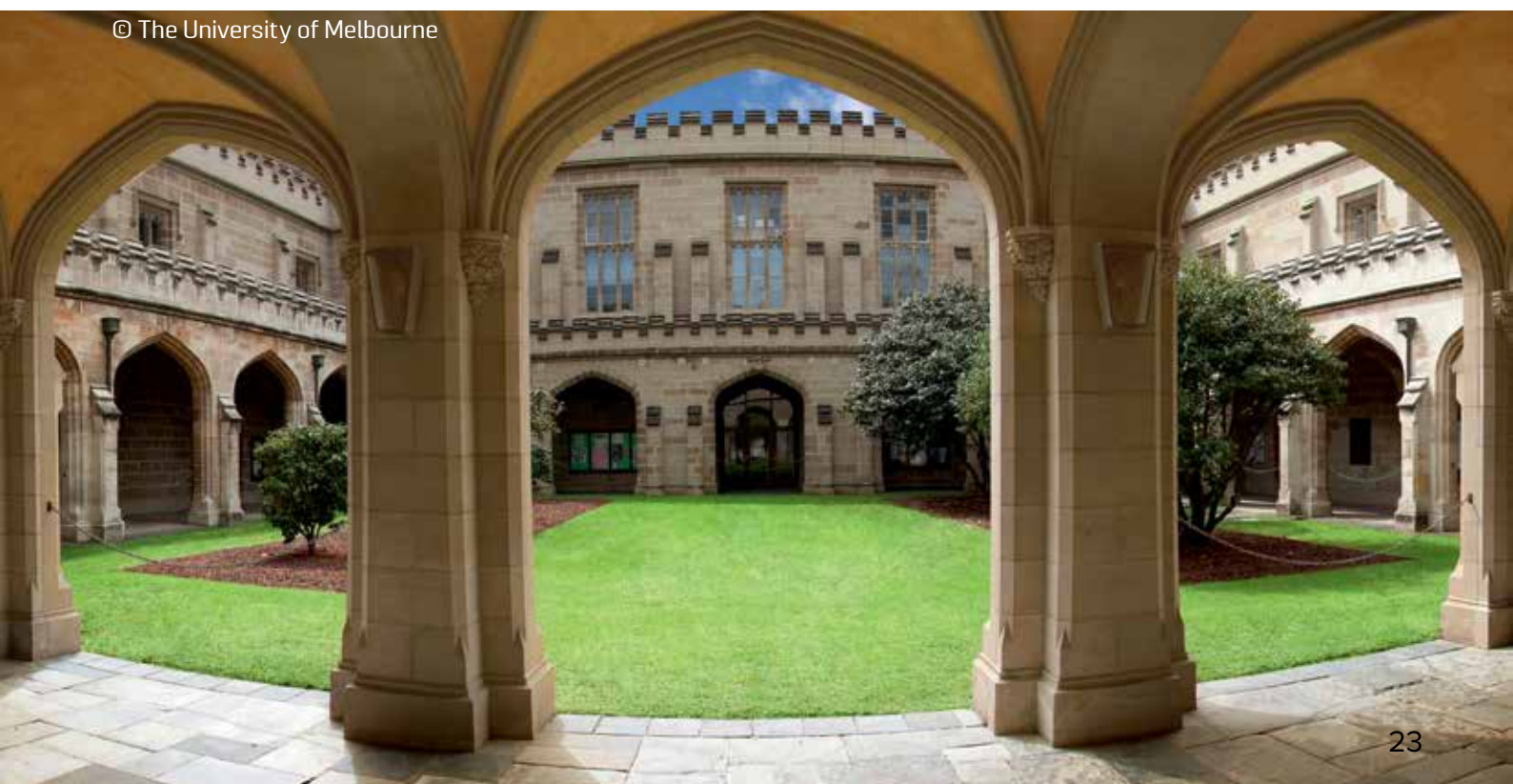
Beyond biomedicine, this new capability will ignite exciting new opportunities for agricultural and environmental industries.

From mid-2017, the unprecedented sequencing capacity of the NovaSeq system will provide us with the means to study >30,000 patient genomes per annum.

Given this scale, the platform will rapidly expand our Precision Oncology Sequencing Program and greatly enable the Cancer and Rare Genetic Disease programs of the Australian Genomics and Melbourne Genomics Health Alliances.

- Professor Sean Grimmond
Director of Research, UMCCR

© The University of Melbourne





Research Partnerships

AGRF has a history of forming strong partnerships with academic, clinical and industry bodies. One of our first partnerships resulted in the sequencing of the landmark first marsupial genome, the Tamar Wallaby.

AGRF recognises the importance of supporting Australian researchers. As part of our ongoing commitment to “growth through transformation”, a dedicated partnerships role was established to maintain existing and develop new key partnerships within the Australian research community.

AGRF’s Research Partnerships are aimed at leveraging our internal resources and expertise to facilitate high-profile and transformative outcomes with academic and commercial entities.

We are actively seeking to form research partnerships across agricultural, environmental and biomedical sectors.

Agricultural Partnerships:

With Professors Alan Cooper, Matthew Gilliam and others at the University of Adelaide, AGRF is helping to recover genetic information from containers of grain laid down by Neolithic farmers around 5,000 years ago.

Led by Professor Vladimir Jiranek of the University of Adelaide, five years of funding was approved for an ARC Industrial Transformation Training Centre for Innovative Wine Production. AGRF is a proud industry partner in this new initiative helping to understand the genomics of “terroir”.

Led by Professor Dean Jerry of James Cook University, the ARC Industrial Transformation Research Hub for Advanced Prawn Breeding project aims to revolutionise prawn production by aquaculture. AGRF is assisting in developing breeding programs through genomic analyses.



Ecological & Environmental Partnerships:

AGRF is working with Professor Andrew Lowe, from the University of Adelaide on an ARC Discovery project to understand the population genomics of native plants in relation to local climate.

A Bioplatforms Australia / NCRIS supported project led by Professor David Cantrill, is bar coding the fungal specimens held by the Melbourne Royal Botanic Gardens. AGRF is assisting with established DNA bar coding work and with the transition to Next Generation technologies.

AGRF is helping to understand how mammalian genomes have responded to previous climate change events by using permafrost-preserved bones of bison and cattle populations dating back 30,000 years, in a project led by Professor Alan Cooper of the University of Adelaide's Australian Centre for Ancient DNA.

BPA & NCRIS Partnerships:

Our Partnership efforts assist Bioplatforms Australia's National Framework Datasets projects. Through these projects, we collaborate with Australian researchers to help create genomic datasets of long-term value to human health and the understanding of our unique flora and fauna.

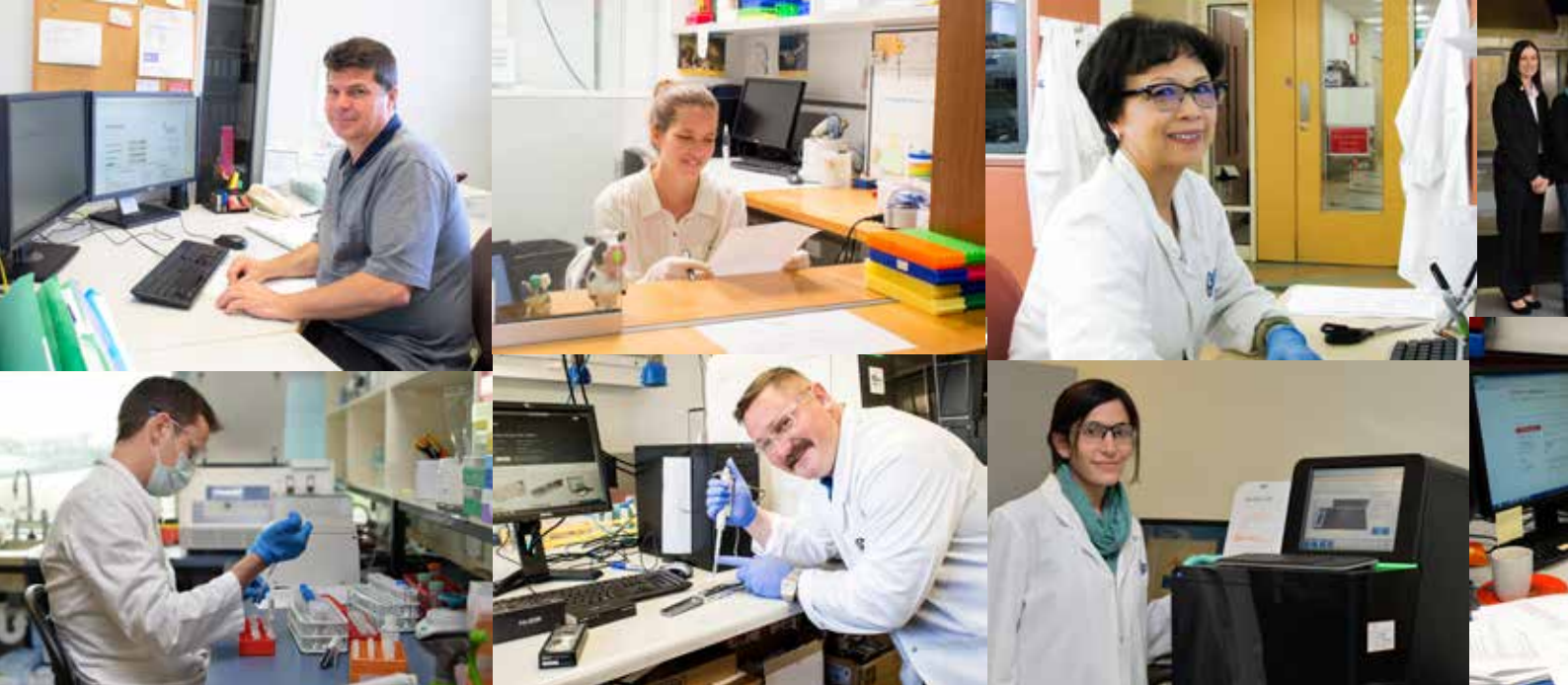
The outputs from these projects are used to underpin research goals and support decision-making.

Biomedical Partnerships:

Working with Dr. Mirana Ramialison of Monash University, and with support from the Rotary Club of Australia, AGRF will assist in the identification of non-coding genomic regions involved in congenital heart disease.

In conjunction with Dr. Xanthe Mallett of Forensic Human ID Pty Ltd, AGRF and Bioplatforms Australia are working to assess the ability of software to predict key facial features of either a perpetrator or victim from traces of even highly degraded DNA sourced from crime scenes.

A major, collaborative five-year Cancer Research Trust Grant has been awarded to Professor Alistair Forrest at the Harry Perkins Institute of Medical Research. This grant will enable single cell genomics research in cancer, paving the way to precision medicine. AGRF will provide innovative genomics services in an effort to accelerate this ground-breaking research.





Engagement & Education

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Engagement Activities
2016/2017

Activities

Dr Sonika Tyagi presented at the Galaxy Australasia Meeting in Melbourne.

Dr Sonika Tyagi & Alexis Lucattini presented a workshop at the Australian Bioinformatics & Computational Biology Society Conference in Brisbane. AGRF was also represented at this conference in 10 abstracts, with 5 as primary authors.

Dr Ken McGrath & Alexis Lucattini hosted a workshop at PoreCamp Australia, in both Melbourne and Canberra.

Dr Matthew Tinning, Rachael McNally & Dr Jafar Jabbari presented posters at the 38th Annual Lorne Genome Conference.

Dr Ken McGrath presented at the Genomics Standard Consortium in Brisbane.

Alexis Lucattini ran a workshop at the World Government Summit in Dubai.

Dr Ken McGrath presented two talks at the Association of Biomolecular Research Facilities in San Diego.

Alexis Lucattini gave a seminar at the Victorian Comprehensive Cancer Centre, on the Oxford Nanopore MinION system.

Dr Ken McGrath ran a PoreCamp workshop at Australian National University.

Dr Gai McMichael presented a poster at the 2016 Australasian Genomic Technologies Association Conference in Auckland.



Dr Ken McGrath,
Brisbane Node Manager

Outreach for Fostering Science Support

- Harry Perkins Institute Open Day
- BioMelbourne Network – Connecting Women Lunch
- Westmead Hub Day
- Centre for Australian Biodiversity and Heritage Launch
- MetaSUB – Sampling Day – Brisbane
- Extreme Microbiome Project (XMP)
- UQ Winter School
- OzMammals Project Launch



Rachel Kliese,
Senior Account Manager

Publications

Monica Molano, Sepehr N. Tabrizi, Suzanne M. Garland, Jennifer M. Roberts, Dorothy A. Machalek, Samuel Phillips, [David Chandler](#), Richard J. Hillman, Andrew E. Grulich, Fengyi Jin, I. Mary Poynten, David J. Templeton, Alyssa M. Cornall, SPANC Study Team (2016). CpG Methylation Analysis of HPV16 in Laser Capture Microdissected Archival Tissue and Whole Tissue Sections from High Grade Anal Squamous Intraepithelial Lesions: A Potential Disease Biomarker. *Plos One*, 11 (8), 1-15.

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Jackson N. Reilly, Eileen A. McLaughlin, Simone J. Stanger, Amanda L. Anderson, Kate Hutcheon, Kiralee Church, Bettina P. Mihalas, [Sonika Tyagi](#), Janet E. Holt, Andrew L. Eamens & Brett Nixon (2016). Characterisation of mouse epididymosomes reveals a complex profile of microRNAs and a potential mechanism for modification of the sperm epigenome. *Scientific Reports*, 6 (August), 31794.

Nathan S. Watson-Haigh, Jerico Revote, Radosław Suchecki, [Sonika Tyagi](#), Susan M. Corley, Catherine A. Shang and Annette McGrath (2017). Towards an open, collaborative, reusable framework for sharing hands-on bioinformatics training workshops. *Briefings in Bioinformatics*, 18 (2), 348-355.

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Our Executive Team

Our newly formed Executive Team is responsible for the strategic management and leadership of AGRF, ensuring that we remain an innovative and accountable world class genomic facility.



Irene Kourtis - Chief Executive Officer
BSc (Hons) PhD GradDipLaw GAICD



Stephan Scheffer - Executive, Finance & Business Services
BComm (Hons) (CA) AICD



Maria Ricci - Executive, Business & Market Development
MAppSc
(joined 2017/2018)

Kirby Siemering - Executive, Science & Technology
BSc (Hons), PhD



Karen Jenkins - Executive, People & Culture
GradDip (IR/HRM) GradDipEd BAppSc
(joined 2017/2018)



John R. Stephen - Executive, Research Partnerships
& Acting Executive, Service Delivery
BSc (Hons) PhD





Our Governance

The Australian Genome Research Facility was governed during the financial year ending June 30, 2017, by eight directors, led by Professor Rob Lewis. The Directors are responsible for the oversight of policies, strategic direction and risk management.

The 2016/2017 Directors were:

Professor Robert Lewis

(Chairman)

BSc (Hons), DSc (*honoris causa*), FTSE, FSARDI, PSM

Member of the Finance, Audit & HR Committee.

Professor Lewis is an Honorary Fellow of the South Australian Research and Development Institute (SARDI) and a Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE). Professor Lewis provides extensive guidance as the Chairman of the AGRF Board. He is also a member of the Finance, Audit & HR Committee. Professor Lewis contributes as a liaison with the agricultural and environmental sectors and is AGRF's representative for Genomics Australia.

Professor Nick Samaras

(Deputy Chairman)

BSc (Hons), PhD, MBA, FAIM, FAICD, FWCLP

Member of the Finance, Audit & HR Committee.

Professor Samaras is the CEO of Murigen Therapeutics Pty Ltd and Chairman of Genetic Signatures Ltd. He has extensive experience in the global life sciences and advises the AGRF Board on current technological advances, market trends and industry engagement. In addition, he had the role of AGRF's Company Secretary from October 2016 to August 2017.

Dr Irene Kourtis

(Managing Director)

PhD, GDipLaw, GAICD

Dr Kourtis is currently the Chief Executive Officer of AGRF and has an extensive background leading strategy, operations, change and business growth. Commencing as Managing Director of the AGRF Board in April 2017, she manages the performance of the organisation, the Board's strategy, and the formulation and successful implementation of AGRF company policy.

Professor Benjamin Kile

BSc (Hons), LLB (Mon), PhD

Member of the Finance, Audit & HR Committee.

Professor Kile was the representative from Walter and Eliza Hall Institute of Medical Research until April 2017, when he relocated to Monash University as the Head of the Department of Anatomy and Developmental Biology. His key contribution to the Board has been to act as an independent director and intermediary to the medical research sector.

Professor Brandon Wainwright

BSc (Hons), PhD

Professor Wainwright is the Director of the Institute for Molecular Bioscience at the University of Queensland. As well as acting as a representative of the University of Queensland, he provides services to the AGRF Board as a liaison with the Queensland Government

Dr John Bell

BSc, MSc, PhD, FTSE, FRACI, Comp I.E. Aust, MAICD.

Dr Bell is a Senior Associate with ACIL Allen Consulting and a Senior Policy Adviser to the Australian Academy of Technological Sciences and Engineering, with previous experience working as the Deputy Secretary and Chief Science Advisor in the Department of Industry and Science. Dr Bell provides an invaluable service to the AGRF Board as a government liaison and advisor.

Mr Andrew Macdonald

BSc, BBus, CPA, MAICD.

Chairman of the Finance, Audit & HR Committee.

Mr Macdonald has over 25 years of commercial experience, working across the biotechnology, technology and finance sectors in Australia, the US and the UK. In his role as Chair of the Finance, Audit & HR Committee, Mr Macdonald provides significant contributions in the areas of business and finance.

Professor Gabrielle Belz

BVBiol, BVSc, PhD, DVSc

Professor Belz is currently the ARC Future Fellow and NHMRC Elizabeth Blackburn Fellow. She joined the AGRF Board in April 2017 as a representative from Walter and Eliza Hall Institute of Medical Research and The University of Melbourne.

Professor Graeme Suthers

MBBS BSc (Med) PhD FRACP

FRCPA GAICD.

Professor Suthers is an Affiliate Professor of the University of Adelaide as well as the National Director of Genetics for Sonic Healthcare (Australia). He contributed widely to the AGRF Board as a member until April 2017.

Our Funding Partners

The work that we do is made possible with the support of our funding partners. We would like to thank the Commonwealth Government infrastructure funding schemes administered through Bioplatforms Australia.



BIOPLATFORMS
AUSTRALIA

NCRIS
National Research
Infrastructure for Australia

The Australian Genome Research Facility (AGRF) was established in 1997 as part of the Commonwealth Government's Major National Research Facility (MNRF) Program and provides open access for the life sciences community to our state-of-the-art genomic platforms.

In 2006, the Australian Government initiated a series of programs called the National Collaborative Research Infrastructure Strategy (NCRIS), and created Bioplatforms Australia to manage the emerging "omics" area.

