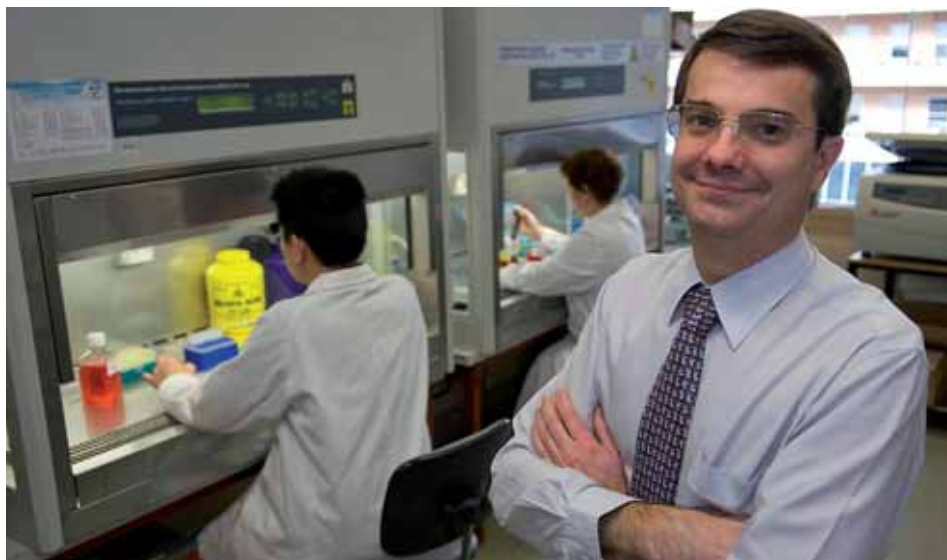


Collaborative Research

Clinical Translation

The translation of basic research programs into the clinical setting enhances human health and patient welfare. The Institute has a proud history of bench to bedside research that has led to improvements in clinical practice in cancer medicine, infectious diseases, immunology and diabetes. This tradition continues today with translational research programs in the areas of leukemia, lymphoma, breast cancer, diabetes, rheumatoid arthritis, coeliac disease and malaria. The scientific highlights of these research programs are reported within the reports from each Division. Major international and national collaborations are features of these programs, as are collaborations with the pharmaceutical and biotechnology industries.

Translational research at the Institute is nurtured by strong clinical links, with 9 current joint appointments of clinician-scientists between WEHI and the Royal Melbourne Hospital and 11 medically qualified PhD students. WEHI's Clinical Advisory Group, which is chaired by Dr Andrew Roberts and includes several RMH representatives, advises on clinically related activities at the Institute, and drives new initiatives in this area. A key focus this year for the Clinical Advisory Group was planning for the Clinical Translation Centre as part of the new WEHI building project. The Centre will form the cornerstone of translational research activity at the Institute, and will support and enhance the ongoing application of research discoveries into the clinic. Facilities at the Centre will include contact rooms for participants of clinical and translational research projects.



A/Professor Andrew Roberts, Chairman, WEHI/RMH Clinical Advisory Group.

The Institute was part of a consortium awarded \$5m from the Australian Cancer Research Foundation to drive translational cancer research activities on the Parkville campus. Other consortium members included the Royal Melbourne Hospital, the Ludwig Institute for Cancer Research, the Royal Women's Hospital and the University of Melbourne. This grant will help establish the Australian Cancer Research Foundation Centre for Therapeutic Target Discovery, with the aim of discovering how cancers develop and progress. The Centre is headed by Associate Professor Geoff Lindeman (Clinical Director) and Professor Andreas Strasser (Scientific Director).

Bio21 Cluster

WEHI is a Founding Member of Bio21 Australia Ltd, a health sciences research cluster of 20 member organisations in the Parkville, East Melbourne and Heidelberg/Bundoora precincts. The Bio21 Cluster vision is to enhance basic and clinical biomedical science, translational clinical research and practice, biotechnology development, science education and communication. During the year WEHI has particularly supported the following:

- The Undergraduate Research Opportunities Program (UROP). UROP provides the opportunity for high achieving undergraduate students to experience scientific research at an early stage by participating in a research laboratory project at 2nd or 3rd year level, alongside their usual undergraduate coursework.

The overall aim is to encourage these students to progress to higher degrees and a career in medical research. UROP has received a second round of State Government support for the period 2007 – 2009. During 2006/2007 thirteen students have been placed at WEHI in the Divisions of Bioinformatics, Structural Biology, Immunology, Cancer and Haematology, and Molecular Medicine.

- The Bio21 Cluster has taken the lead in developing the Victorian Clinician Researcher Fellowship proposal to provide support for early career clinician researchers. To underpin this development the Bio21 Cluster commissioned an independent report on the "The Benefits of Translating Medical Research into the Health

Care System". The report was prepared by Insight Economics (Deloitte) and presented in March 2007. The report concluded that the potential benefits of biomedical research are diverse, potentially large and much broader than financial outcomes associated with the commercialisation of research outputs.

- Professors Suzanne Cory and Nic Nicola are the WEHI representatives on the Bio21 Cluster Scientific Advisory Council. This group, comprising representatives of all Founding and Joining Members, meets monthly to discuss a wide range of topics that affect the cluster and to hear from invited speakers on new and emerging areas, and opportunities for collaboration.

Australian Genome Research Facility (AGRF)

Together with the University of Queensland, WEHI helped establish the Australian Genome Research Facility (AGRF) as a national facility for large-scale DNA sequencing and genotyping. The year ending June 2007 marks AGRF's tenth full financial year of operation. AGRF's mission remains focused on being the key enabler of genome science in Australia and this is predicated by providing access to, and education in, the latest relevant technology for users and stakeholders.

New technologies in microarray and sequencing introduced by AGRF in direct response to the technological demands of the market continue to position AGRF as a leader in supplying innovative services for cutting technologies. The combination of these technologies will address current genomic services needs for academic researchers as well as increasing uptake of genomics in the commercial sector.

In the field of microarray analysis, AGRF acquired Agilent "Certified Service Provider" status. The Agilent platform will allow AGRF to provide microarray solutions to the clinical research and drug discovery market segments. The microarray unit also introduced the illumina gene expression service in early 2007.

The most significant investment in new technology was the acquisition of the Roche GS FLX whole genome sequencer. This technology will allow AGRF to be a competitive alternative to overseas providers.

The Wallaby Genome sequencing project was completed in May 2007 as part of a major international collaboration between the National Institutes of Health (NIH) and the AGRF. The major supporter of the Australian contribution was the Victorian state government and the

results are being utilised in many sectors of Australian science. The WEHI bioinformatics team is using it to perform major comparative genome studies.

Following the generation of the NCRIS Roadmap of research infrastructure, collaborative networks of existing and new service providers have been developed to deliver access to state-of-the-art technologies for the next four years. Under the banner of Bioplatforms Australia, significant investment will take place in genomics, proteomics, metabolomics and bioinformatics to enable a systems biology approach for Australian biological research initiatives.

Joint ProteomicS Laboratory (JPSL)

JPSL, a joint initiative of WEHI and the Ludwig Institute for Cancer Research (LICR), was established in 1983 to make cutting-edge analytical technology for protein and peptide characterisation available to both institutes. JPSL comprises two separate but interrelated components: a research arm led by Professor Richard Simpson and a high throughput proteomics service facility managed by Dr Robert Moritz.

The Australian Proteomics Computational Facility

Developments in mass spectrometry technology have driven the science of proteomics, which seeks to identify proteins important in many biological and disease processes. Recent improvements have vastly increased the speed at which mass spectra can be generated, and proteins are now routinely being identified in under a second. This has led to an explosion in the volume of mass spectrometry data. Although many Australian laboratories have invested in the mass spectrometry equipment required for high throughput protein identification, few have been able to finance and install the larger and larger computer systems required to process such huge volumes of data, or the specialist infrastructure needed to support the conversion of mass spectra into protein identifications.

Australian proteomics scientists have elected to take a unique, co-operative approach to this problem. The idea, initially conceived by Dr Robert Moritz, Eugene Kapp and Professor Richard Simpson of JPSL and Professor Tony Burgess of the LICR, was to bring together

proteomics researchers from all over Australia to collaborate in establishing a national proteomics computer facility. In 2005, a \$2 million Enabling Grant from the National Health and Medical Research Council (NHMRC) was awarded to the consortium. This was used to design and construct an advanced, flexible, high-performance computing cluster that was made accessible, via the web, to any scientists working in the proteomics field in Australia or New Zealand.

The new Australian Proteomics Computational Facility (APCF), which is housed within JPSL, provides a standardised suite of data processing software that easily enables the generation of protein identification data sets that meet the standards set by international proteomics journals and organisations. It also provides a forum in which Australian proteomics researchers can collaborate on new software development or testing, or on the creation of specialist databases of protein sequence data.

A totally inclusive, national approach to the design and management of the APCF was ensured when Dr Moritz formed a central committee of scientists from all over Australia, which drew on the expertise of a wide range of proteomic scientists as well as the Victorian Partnership for Advanced Computing and the Australian Partnership for Advanced Computing. The concept of single computer cluster to service proteomics computing requirements for the whole of Australia is a world first and serves as an example of Australian ingenuity and cooperation.

Links: <http://www.apcf.edu.au>

\$1 million grant from the Australian Cancer Research Foundation for Cancer Proteomics

The Australian Cancer Research Foundation (ACRF), which was established in 1984, provides grants of \$1 million upwards to leading Australian cancer research teams for infrastructure, capital works and equipment. It has recently awarded a \$1 million dollar grant for the Cancer Proteomics Program in JPSL, which has been used to fund the purchase of a new mass spectrometer. The new program was inaugurated in March this year by the Hon John Brumby, MP. At an opening ceremony, the ACRF Chairman, Mr Tom Dery, presented a cheque to Professor Tony Burgess, the director of the LICR, and Mr Ed McDermott from LICR's New York headquarters.

The new mass spectrometer, an LTQ Orbitrap hybrid, has the advantage of greatly increased sensitivity and accuracy, and is ideal for quantitative proteomics. It will be used primarily for the discovery of new biomarkers for colorectal cancer (CRC). CRC is now one of the most common cancers in the western world, but it can be effectively treated if detected at an early stage. The Cancer Proteomics Program involves the search for proteins and/or peptides that will be signatures for the presence of early stage CRC, and can be used diagnostically for the early detection of CRC.