Biotechnology

The University of Adelaide is a major centre of innovation in biotechnology with areas of expertise spanning human, agricultural industrial and plant biotechnology. Adelaide has enjoyed a reputation for over a quarter of a century as the birthplace of molecular biosciences in Australia, pioneering recombinant DNA technology in this country.

The University has produced three successful biotechnology companies including two which have been listed on the stock exchange, BresaGen Ltd, GroPep Ltd and GeneWorks. Research in the 1980s on enteric pathogens led to the development of a candidate oral vaccine against cholera. Innovative vaccine research continues, with candidate vaccines against pneumococcal, melanoma and hepatitis under trial.

Today, the University's School of Molecular and Biomedical Science encompasses more than 40 research teams engaged in cutting edge work in biochemistry, molecular genetics, microbiology, virology, immunology and physiology. These studies focus on an understanding of, and the potential for new therapeutic approaches to, major diseases such as cancer, neurological disorders, developmental abnormalities, genetic and viral diseases, chronic inflammatory diseases, and bacterial infections.

The University is home to the ARC Special Research Centre for the Molecular Genetics of Development, which is a focus for developmental biology, microscopy and genome analysis in Australia. The Australian Research Council noted the Centre's "ability to recruit post-doctoral researchers of a very high calibre from a variety of blue-ribbon international research institutes and universities".

There are several groups undertaking innovative biotechnology research in plant functional genomics to identify targets and markers for better plant varieties, genetic mapping in sheep and cattle for improved beef and lamb traits and basic hair biology for the purpose of improving hair properties such as length, shape, diameter and strength for agriculture and cosmetic applications.

The University's commercial agricultural bioscience partners include the Molecular Plant Breeding Cooperative Research Centre (MPB CRC), Bio Innovation SA, Lifeprint Australia, South Australian Research and Development and the Agricultural node of the Australian Genome Research Facility.

Areas of Expertise

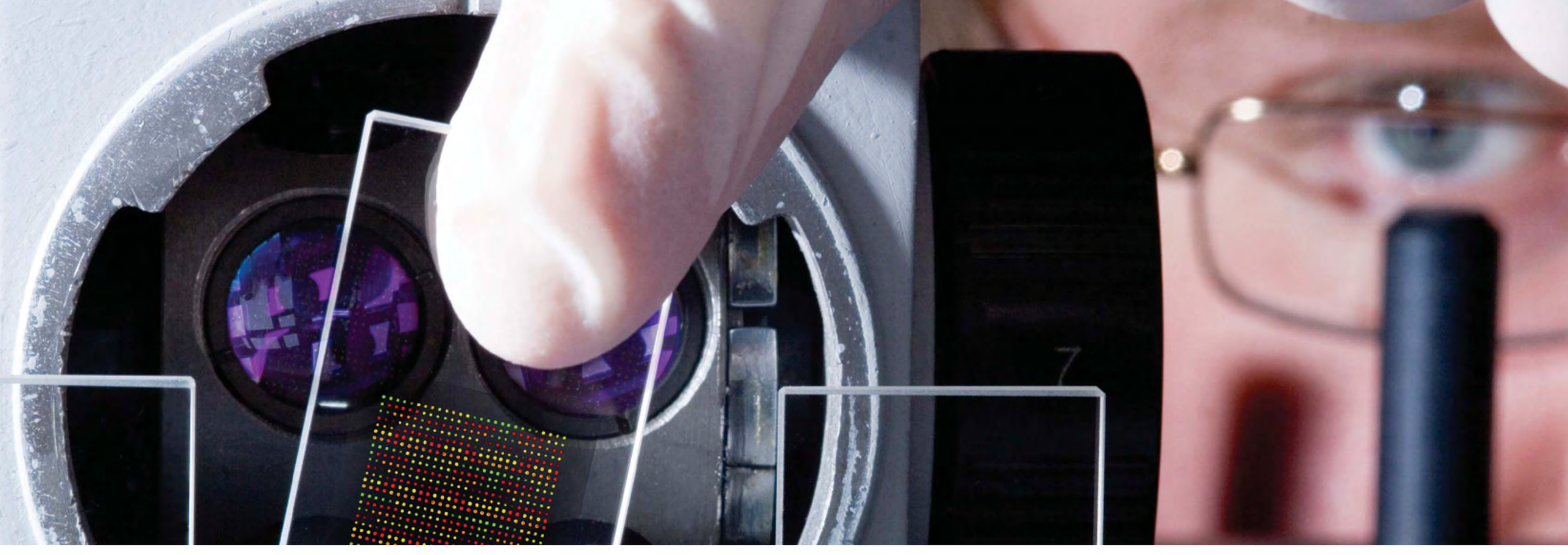
- Biological chemistry
- Molecular genetics and protein interactions
- Infectious diseases
- Digestive diseases
- Cancer & auto-immune diseases
- Molecular medicine

New Strategic Focus

Gene can increase beef yield
University of Adelaide researchers in Animal Science have discovered a gene which can increase beef yields by 20 per cent. The gene is a modification of the Myostatin gene and is found naturally in Limousin cattle. The gene increases the amount of prime cuts and also improves the tenderness of the meat. This discovery has the potential for positive impacts on Australia's export produce.

Bacterial Pathogenesis Laboratory
This is part of the Adelaide Node of the NHMRC Australian Bacterial Pathogenesis Program (Chief Investigators: Prof. James Paton, Dr. Adrienne Paton and Dr. Renato Morona). In spite of the availability of antibiotics for over fifty years, bacterial infectious diseases continue to kill more people than any other disease group. New pathogens are emerging, old ones are returning, but this time with resistance to multiple classes of antimicrobial drugs.

Current research activities span the fundamental mechanisms of bacterial pathogenesis and the identification and characterisation of virulence genes, to the development of improved vaccines and therapeutic strategies. Such studies are fundamental to the effective global management of these infections in the 21st century. The lab is funded by a NHMRC Program Grant and by the Bill and Melinda Gates Foundation's "Grand Challenges in Global Health".



Services & Facilities

Adelaide Microarray Centre
This Centre was jointly established by the University of Adelaide and the Hanson Institute in 2001. Microarray technology allows researchers to discover novel genes and accurately profile genes involved in different disease, cellular and developmental processes. The Centre was the first in Australia to offer a service for microRNA profiling using microarrays.

Adelaide Microscopy
Adelaide Microscopy offers a broad range of the most technologically advanced instrumentation for microscopy and microanalysis. It is part of the Australian Microscopy & Microanalysis Research Facility funded under the Commonwealth Government's National Collaborative Research Infrastructure Strategy. The Centre's state of the art equipment and extensive professional experience assures clients complete confidence in the analysis of nanostructures of non-biological and biological materials. Its services are available to, and extensively used by, universities, other institutions and the corporate sector.

Genomics
DNA and protein sequencing services are available along with experienced staff from the School of Molecular & Biomedical Science at the University of Adelaide and the Institute of Medical and Veterinary Science (IMVS).

Adelaide Proteomics Centre
The Adelaide Proteomics Centre is a joint venture of the University of Adelaide and the Hanson Institute of the IMVS, established with support from the Australian Cancer Research Foundation. It offers researchers a state-of-the-art proteomics facility. The Proteomics Centre has the latest mass spectrometry technology to identify proteins and characterise their post-translational modifications.

GenSA
GenSA is an exciting collaborative project involving SA Pathology (Institute of Medical and Veterinary Science, Hanson Institute), the University of Adelaide and Flinders University. GenSA provides specialists within all areas of embryology, transgenic production and animal husbandry. Anaylsis tools are available for hire on a short term basis including Biacore - real-time biomolecular interaction analysis, Confocal Microscopy, FACS Analysis, Mass Spectrometer and Molecular Imager.

Australian Centre for Plant Functional Genomics (ACPFG)
ACPFG is one of the largest crop genomics centres in the Southern Hemisphere, employing more than 110 staff. Its headquarters are at the University of Adelaide's Waite Campus with research nodes at the University of Melbourne, Department of Primary Industries at La Trobe University and the University of Queensland. ACPFG is working to improve the resistance of wheat and barley to hostile environmental conditions, using functional genomics technologies. Scientists at the ACPFG are focusing on stresses that impact on agriculture in Australia, including drought, salinity, high or low temperatures and mineral deficiencies or toxicities. These stresses, known as abiotic stresses, are a major cause of cereal crop yield and quality loss throughout the world.

Centre for Stem Cell Research (CSSR)
This Centre is a collaborative initiative comprising 18 mature research groups located in the Faculty of Health Sciences, the Women's and Children's Hospital, the Institute of Medical and Veterinary Sciences, and the Queen Elizabeth Hospital. Its members undertake internationally recognised and awarded research on areas such as the isolation of adult and cord blood stem cells, clinical applications including potential cures for stroke damage and cardiac repair, as well as novel approaches to diseases such as cystic fibrosis and leukaemia. The focus of the centre is on translating basic research into clinical and commercial outcomes via collaboration of its members, and with external partners.