Victoria's Leadership in Medical Research

Victoria is continuing to build on a long established international reputation for excellence in biomedical research and biotechnology. The State is home to 13 major medical research institutions, 7 teaching hospitals and 9 universities. Of the top listed life science companies on the ASX, 10 are Victorian-based. These 10 companies make up nearly three quarters of the cumulative value of the top 20 companies. Victoria consistently wins the lion's share of national medical research funding with over 40 per cent of grants awarded to Victorian researchers. Victorian Government support and leadership have enhanced the capacity of researchers, institutions and companies to attract international partnerships and investment.

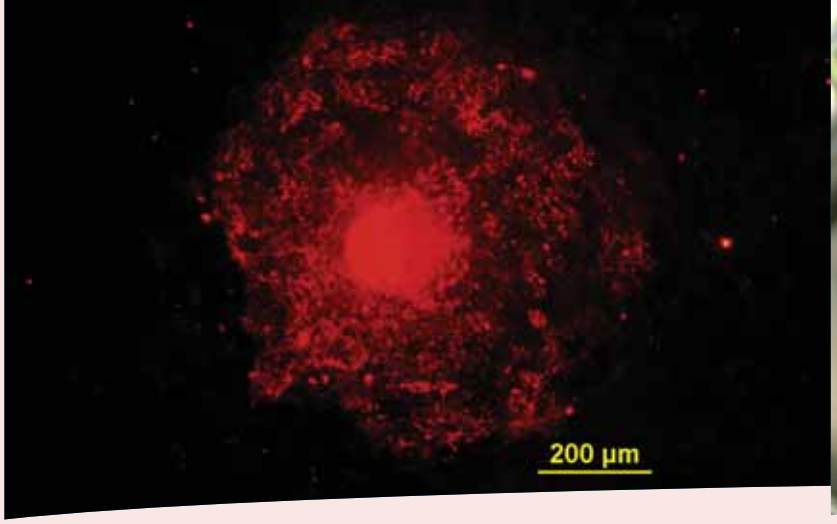
Cancer

Inflammation directly linked to colon cancer (Feb 2009)

Scientists at the Melbourne Branch of the Ludwig Institute for Cancer Research and the Technical University Munich have discovered how the Stat3 protein links inflammation to tumour development, a discovery that may lead to the identification of new therapeutic targets for colon cancer. These results were published online in the journal *Cancer Cell*.

Victoria leads Australian Ovarian Cancer Study (Feb 2009)

Researchers at Victoria's Peter MacCallum Cancer Centre are leading an Australian Ovarian Cancer Study (AOCS) in conjunction with the University of Melbourne, the Queensland Institute of Medical Research, and the Westmead Hospital in Sydney. Professor David Bowtell from the Peter Mac is the Principle Investigator of the AOCS, which is investigating lifestyle and environment factors linked to cancer.



ACRF Centre for Therapeutic Target Discovery launched at the Walter and Eliza Hall Institute (Jan 2009)

The Australian Cancer Research Foundation Centre for Therapeutic Target Discovery was officially opened in January 2009. Supported by a $5 million grant to a Melbourne consortium, at the time the ACRF's biggest-ever grant, the Centre provides advanced technology platforms to support cancer research, including cell sorting, RNA interference, genome-wide screening for mutations, molecular pathology, microscopy, imaging and animal models of cancer. The consortium includes the Walter and Eliza Hall Institute, the Ludwig Institute for Cancer Research, the University of Melbourne, the Royal Melbourne Hospital and the Royal Women's Hospital.

World's biggest leukaemia study (Dec 2008)

New global research led from the Murdoch Childrens Research Institute (MCRI) at Melbourne's Royal Children's Hospital aims to determine the risk factors for leukaemia by studying 1 million pregnant mothers and their children. The MCRI played a key role in planning the study, in which the genetic make-up, health history and environment of the mothers and children will be exhaustively recorded. MCRI will coordinate the collection of the data as it builds into a resource that scientists can examine.

Melbourne cancer stem cell find (Dec 2008)

Scientists at St Vincent's Institute, who are collaborating with the Hanson Institute in Adelaide in the fight against one of the deadliest cancers – acute myeloid leukaemia – have created an antibody that targets leukaemia stem cells left after chemotherapy. Melbourne biotech CSL will be developing the treatment for which clinical trials are already in progress.

Stem Cells

Australian first for Melbourne scientists (Feb 2009)

Monash University researchers have created Australia's first human-induced pluripotent stem (iPS) cell lines. Scientists from the Monash Institute of Medical Research (MIMR) have derived the cells from skin cells, and reprogrammed them to behave as embryonic stem cells: a breakthrough that will allow Australian scientists to study a range of diseases. Dr Verma and his team at MIMR will now generate iPS cells from type 1 diabetes patients to help understand the disease and develop better drugs.

Geelong, Victoria, leading cord-blood stem cell research (Nov 2008)

In a world-first discovery, Associate Professor Mark Kirkland from Barwon Health has found a way to make beating heart cells from the stem cells of skeletal muscle. The Director of Barwon Biomedical Research has also led ground-breaking research into cord-blood stem cells, investigating the growth and use of the stem cells, and particularly the capacity of cord-blood-derived cells to differentiate into other cell types such as heart muscle cells and insulin-producing beta-cells.

Australian researchers create living heart muscle cells from fat (Oct 2008)

Scientists from the Bernard O'Brien Institute of Microsurgery in Victoria have made a significant advance in tissue engineering with the creation of living heart muscle cells from human fat stem cells. If successful in clinical trials, this process could eliminate the problems of tissue and organ rejection. It would also overcome the shortage of donor tissue, because fat tissue is in plentiful supply.

Harvard stem cell researchers recruited to St Vincent's Institute, Melbourne (Oct 2008)

St Vincent's Institute has recruited Drs Carl Walkly and Louise Purton, two leading international researchers, to head-up its new Stem Cell Regulation Unit. Both are Melbourne ex-pats who were working at Harvard. The focus of the new Unit is to gain a full understanding of how stem cells are regulated, including processes involved in normal blood cell production and disease.

Stem cell treatment for vertebral repair (Sept 2008)

Melbourne is set to host the world's first clinical trials of a new medical treatment that could give hope to millions of people suffering neck spinal pain and injuries. Monash University scientists Professor Graham Jenkin and neurosurgical registrar Dr Tony Goldschlager, together with Melbourne-based biotechnology company Mesoblast Ltd, have pioneered a new treatment using a unique population of adult stem cells that has significantly increased the success rate and shortened recovery times of neck spinal fusion surgery in preclinical trials in animals.

Australian Stem Cell Centre launches Stem Cell Channel website (June 2008)

Aided by a grant from the Victorian Government, the Australian Stem Cell Centre developed the Stem Cell Channel website, which provides information about stem

cells from a range of expert sources via interviews, animations and mini documentaries. In addition, students may email questions to working stem cell scientists at the ASCC and receive a reply within 48 hours. The ASCC also routinely provides presentations to high school students and fields many telephone enquiries from members of the general public regarding stem cell therapies being developed both within Australian and overseas. Visit www.stemcellchannel.com.au

Immunology and Infectious Diseases

Coeliac vaccine trials world first (April 2009)

Phase I clinical trials for a world-first experimental vaccine for coeliac disease (or gluten intolerance) will begin in Melbourne in April 2009. Clinician researcher Dr Bob Anderson at the Walter and Eliza Hall Institute has developed a vaccine intended to gradually desensitise the coeliac sufferer, so that gluten is tolerated. Coeliac disease is estimated to affect over 6 million people globally.

New tool in fight against HIV (March 2009)

Researchers at the Burnet Institute, Australia's largest infectious diseases research centre, have developed a low-cost, high-throughput laboratory test for measuring CD4 T-cells in the management of HIV/AIDS. Monitoring of CD4 T-cell numbers is an essential tool for appropriate therapy and management of HIV, but access to testing is very limited in many countries because of the high cost of tests and their reliance on expensive and high-maintenance flow cytometry equipment. The Burnet team has developed a test (ELISA) that uses standard equipment available in most laboratories. The test will enter clinical trials in early 2010, and has also provided the basis for development of a low-cost, point-of-care CD4 test for HIV for use in third-world countries.

Victorian find in malaria battle (Feb 2009)

A team of scientists at Monash University has found a way to treat malaria by starving the parasite of the red blood cells it needs to survive. Using the Australian Synchrotron, the team mapped the structure of a key digestive enzyme in the malaria parasite and then worked out how to deactivate it. The discovery will be used to develop more sophisticated anti-malarial drugs. The research was published in the prestigious journal *Proceedings of the National Academy of Sciences* in February 2009.

University of Melbourne researchers prepare for next flu pandemic (Nov 2008)

Backed by the Australian National Health and Medical Research Council, scientists at the University of Melbourne are leading a national consortium of mathematicians, medical specialists, biologists and infectious disease policymakers whose work is helping inform Australia's influenza pandemic plan. Researchers at the University's Nossal Institute of Global Health and the Melbourne School of Population Health are modelling projections for infectious disease spread, size of vaccine and anti-viral stockpiles and public health measures to contain an outbreak. The University, in conjunction with the Murdoch Childrens Research Institute, is also a major partner in the Vaccine Immunisation Research Group (VIRGO) which led clinical trials of a candidate pandemic vaccine developed by Melbourne's CSL.

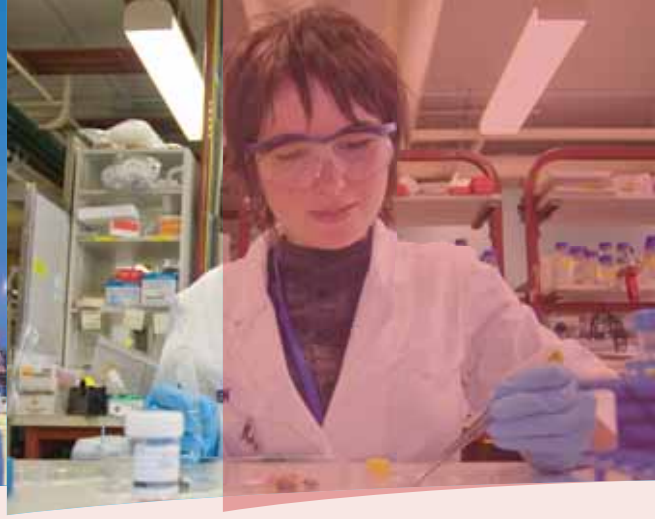
Neuroscience

Victorian breakthrough in dismantling the schizophrenia syndrome (Mar 2009)

Associate Professor Brian Dean and his team at the Mental Health Research Institute in Melbourne have recently found that 25% of people diagnosed with schizophrenia can be separated into a distinct group because they have lost 75% of their cortical muscarinic M1 receptors. Muscarinic M1 receptors are critical in maintaining brain function. This finding shows that schizophrenia is a syndrome of different disorders, not unlike diabetes. The separation of type 1 and type 2 diabetes led to major advances in understanding the different causes of disease and underpinned the development of more targeted drug treatments.

Mental health researcher wins $4 million Australia Fellowship (Jan 2009)

Professor Tony Jorm from the ORYGEN Youth Health Research Centre won an Australia Fellowship from the Australian Government health research funding body, NHMRC, to commence in 2009. Professor Jorm's research focuses on public knowledge and beliefs about mental disorders, and particularly on interventions to improve the public's helpfulness towards people developing mental disorders. A major objective is the development and evaluation of Mental Health First Aid training.



Launch of consortium to create a bionic eye (Nov 2008)

Bionic Vision Australia brings together four leading Victorian research organisations and one from New South Wales in a partnership to create a high-definition bionic eye. Their objective is to create an implantable device to restore vision to patients suffering from age-related macular degeneration and retinitis pigmentosa. The partners include the University of Melbourne, Melbourne's Bionic Ear Institute and Centre for Eye Research Australia, the Victoria Research Laboratory of NICTA, and a group from the University of NSW. The research builds on Melbourne's previous success in creating the world's first cochlear implant or bionic ear.

Melbourne researchers lead Alzheimer's ageing study (Nov 2008)

Early detection of the onset of Alzheimer's disease and dementia is the focus of a world-leading Australian consortium of researchers, led from Melbourne's National Ageing Research Institute (NARI). The Australian Imaging, Biomarkers and Lifestyle Study of Ageing (AIBL) is a collaborative study between NARI, the University of Melbourne, Mental Health Research Institute, Neurosciences Australia, Austin Repatriation Hospital, Edith Cowan University (Perth) and CSIRO. The study – of some 1165 people aged between 60 and 96 – has shown that apparently healthy people with a high level of beta-amyloid protein (the protein over-expressed in the brains of people with Alzheimer's disease) scored notably less well on cognitive testing than people with low levels of the protein.

World-wide stroke trial (Oct 2008)

AVERT (A Very Early Rehabilitation Trial) – a new international stroke trial that provides early exercise therapy within 24 hours of stroke – is an initiative of the National Stroke Research Institute (now part of Melbourne's Florey Neuroscience Institutes). AVERT is a large multi-centre randomised trial that aims to recruit over 2000 stroke patients over the next three years. Four hospitals in Scotland are the first UK hospitals to join the international research team. Dr Julie Bernhardt, physiotherapist and AVERT Program Director, and her team are now testing the impact of very early stroke rehabilitation on death and disability.

Victorian researchers link impaired smell to ADHD (Sept 2008)

Reduced ability to identify smells by children with Attention Deficit Hyperactivity Disorder (ADHD) has revealed for the first time a link between an impaired smell processing ability and ADHD. The one-year study of 88 children aged 6-16 (44 with ADHD), led by the University of Melbourne and the Murdoch Childrens Research Institute at Melbourne's Royal Children's Hospital, showed that the children with ADHD had reduced ability to identify odours. The study involved using scratch and sniff tests of common smells such as orange, chocolate and pizza, and was published in *Journal of Clinical Psychiatry*.

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