Melbourne Biomedical Precinct

WORLD LEADERS IN MEDICAL RESEARCH, EDUCATION AND TREATMENT
THE MELBOURNE BIOMEDICAL PRECINCT PARTNERS

1  The University of Melbourne
2  Walter and Eliza Hall Institute
3  The Royal Melbourne Hospital and Melbourne Health
4  The Royal Women’s Hospital (the Women’s)
5  The Royal Children’s Hospital (RCH)
6  The Murdoch Children’s Research Institute
7  Future home of Peter MacCallum Cancer Centre
8  The Florey Institute of Neuroscience and Mental Health
9  CSIRO

MAJOR MELBOURNE BIOMEDICAL PRECINCT COLLABORATIONS

10 The Victorian Comprehensive Cancer Centre Project
11 The Melbourne Brain Centre
12 The Doherty Institute
13 The Victorian Life Sciences Computation Initiative (VLSCI)
14 Biomedical Research Victoria

NEARBY MAJOR HEALTH & BIOMEDICAL RESEARCH ORGANISATIONS WHICH COLLABORATE WITH PRECINCT PARTNERS

15 The Bio21 Molecular Science and Biotechnology Institute
16 CSL Ltd (Poplar Road and Bio21 Institute campuses)
17 St Vincent’s Hospital Melbourne
18 St. Vincent’s Institute (SVI)
19 Dental Health Services Victoria (DHSV)
20 Orygen
21 The National Ageing Research Institute (NARI)
22 Centre for Eye Research Australia (CERA)
23 Bionics Institute
24 Monash Institute of Pharmaceutical Science, Monash University (Parkville campus)
25 BioGrid Australia
A GLOBAL CENTRE FOR EXCELLENCE IN MEDICAL RESEARCH, INNOVATION AND TREATMENT

The Melbourne Biomedical Precinct, on the edge of Melbourne’s CBD, has established itself as a leading global research and teaching powerhouse and one of the top five biomedical precincts in the world. Precinct partners share a formidable history of ground-breaking medical discoveries and developments, as well as an exciting future focussed on innovation and transformation in human healthcare.

Twenty-five remarkable entities, located within easy reach of each other, are engaged in breakthrough research, education and the delivery of clinical care and health services. This dense concentration of hospitals, research facilities and academic campuses gives extraordinarily talented individuals from a range of disciplines an unparalleled opportunity to work together in world-leading collaborations.

The University of Melbourne, Australia’s leading research university, and ranked in the top 50 globally, serves as the dynamic hub of the Precinct. The University is deeply involved with many Precinct partners, striving to find ways to improve the health of Victorian patients and to discover new treatments and procedures that will benefit mankind. Across the Precinct some 10,000 scientists, clinicians and technical staff are engaged either in undertaking biomedical and healthcare research, teaching and research training, or in supporting these activities.

Consistently ranked as the world’s “most liveable city” in recognition of its rich cultural, sporting and business life, Melbourne has a welcoming and multilingual population of over four million. Victoria’s economy is strong and continues to grow steadily, and this State hosts some 140 biotech and pharmaceutical companies and offers a highly skilled workforce.

Setting inspiring standards in its field, the Melbourne Biomedical Precinct offers a unique academic and research environment to nurture the next generation of outstanding achievers, and shares a commitment to pioneer the world’s best practices in patient treatment and care, for the benefit of not just Australians, but people everywhere.
THE POWER OF PARTNERSHIP: EMBRACING A COLLABORATIVE APPROACH TO ACHIEVE WORLD-CLASS OUTCOMES FOR OUR PATIENTS

Co-location and critical mass engender collaboration, integration and breakthroughs. The critical mass achieved through the co-location of so many leading global research institutes with major world-class hospitals, Australia’s leading University and successful global industries, is a key factor fostering the collaborative research ecology and culture that is characteristic of the Melbourne Biomedical Precinct. Relationships cross boundaries, intersect and flourish between leading global scientists, spanning disciplines, institutions and sectors.

MELBOURNE GENOMICS HEALTH ALLIANCE EXPLORES NEW HORIZONS

Research continues to improve our understanding of the role differences in a person’s genes play in determining their health, the course of a disease and its response to treatment. At the same time, new technologies have made it possible to look at large amounts of genetic information quicker and cheaper than before and for this to be used in planning and delivering patient care. The Melbourne Genomics Health Alliance brings together some of the very best health, research and education organisations in Australia – Melbourne Health [the Royal Melbourne Hospital], The Royal Children’s Hospital, The University of Melbourne, Walter and Eliza Hall Institute, CSIRO, Murdoch Children’s Research Institute and the Australian Genome Research Facility. By joining forces, these organisations contribute to a seamless, translational effort: hospital patients with genetic conditions can have their genome sequenced by scientists; researchers analyse the genomic information; clinician scientists translate this information into actual treatment for patients. Because these patients are carefully monitored, this in turn leads to major advances in the management and treatment of life-threatening conditions that benefits Australians and the rest of the world.

AUSTRALIA CHINA TRAINING INITIATIVE OF NEUROLOGY (ACTION)

Neurological diseases represent an increasing health burden on society. A recent World Health Organization [WHO] Global Burden of Disease Report highlighted the fact that ‘neurological disorders are an important cause of mortality and constitute 12% of total deaths globally’. Closely linked to this finding are the rapid advances in diagnosis and treatment of neurological diseases which provide great potential for improved neurological health. It is only by embracing a solid understanding of these clinical advances that neurologists can provide the best treatments for their patients. The Australia China Training Initiative of Neurology (ACTION) is an initiative of the University of Melbourne in association with the Melbourne Brain Centre at The Royal Melbourne Hospital and Shanghai People’s No 1 Hospital. ACTION provides intensive training, focused on the most up-to-date investigative and treatment paradigms of acute and chronic neurological disease. In this course, Australians share their expertise with China to provide state-of-the-art education for young Chinese neurologists here in Melbourne and neurologists-in-training in China. This initiative provides access to leading academic neurology researchers in Melbourne and has been designed to foster research and clinical collaboration between Chinese and Australian neurologists and hospitals.
RELIEVING THE BURDEN OF EPILEPSY

Epilepsy is one of the most common serious brain disorders, affecting both sexes and all ages with no ethnic or geographical boundaries. For many people, it is a devastating condition that diminishes quality of life and increases the risk of premature death. The Comprehensive Epilepsy Program at The Royal Melbourne Hospital strives to relieve this burden by providing state-of-the-art diagnostic technologies and treatments, training and nurturing new generations of medical professionals, and pursuing cutting-edge research to discover new therapeutic modalities. This internationally recognised epilepsy centre is underpinned by its strong ties with the University of Melbourne, the Florey Institute and other Precinct partners. Myriad research projects across the spectrum of clinical and experimental epileptology and related disorders are actively pursued within the Comprehensive Epilepsy Program. These projects are led by internationally recognised clinicians and basic scientists, and include competitively funded as well as industry sponsored projects. This Precinct has probably the highest density neuroscience research community in the world, creating a conducive and stimulating environment for cross-discipline research.

Professor Ingrid Scheffer has transformed our understanding of epilepsy. Ingrid and her colleagues have described a range of novel epilepsy syndromes beginning in infancy, childhood and adult life. Twenty years ago it was blamed on injuries, tumours – anything but genes. Now, thanks to Ingrid’s work at the Florey Institute and The University of Melbourne, we know genes play a large role. It’s opened the way to better diagnosis, treatment and potential cures. Ingrid has devoted 20 years to clinical research and has identified the first and subsequent 13 of 23 epilepsy genes.

VICTORIAN COMPREHENSIVE CANCER CENTRE PROJECT – WORLD-LEADING COLLABORATION & FACILITIES

The Victorian Comprehensive Cancer Centre Project initiated an alliance of leading cancer organisations, known as the Victorian Comprehensive Cancer Centre (VCCC). This alliance facilitates collaborative cancer research and shared cancer care among its 10 members: the Peter MacCallum Cancer Centre, Melbourne Health, The University of Melbourne, The Walter and Eliza Hall Institute of Medical Research, The Royal Women’s Hospital, The Royal Children’s Hospital, Western Health, St Vincent’s Hospital – Melbourne, Murdoch Children’s Research Institute and Austin Health (incorporating the Olivia Newton-John Cancer and Wellness Centre). The VCCC will accelerate cancer research and help to achieve better outcomes for people with cancer. The VCCC Project is also delivering new, purpose-built facilities to enable shared cancer care and research among world leading organisations. This includes a new home for Peter MacCallum Cancer Centre as well as cancer research, education and clinical services for other building partners: Melbourne Health and The University of Melbourne. The facilities will also link to Parkville campus partners The Royal Women’s Hospital and Walter and Eliza Hall Institute. Opening in 2016, these world class facilities will place many of Victoria’s best and brightest cancer minds side-by-side, expediting advances in cancer research, care and education, for the benefit of people with cancer, everywhere.
INVESTING IN POSSIBILITY AND POTENTIAL

Access to state-of-the-art infrastructure and technologies is critical for advancing medical research and developing new treatments. More than $AUD 5 billion of new public and private investments have flowed into the Melbourne Biomedical Precinct in recent years for the construction of state-of-the-art hospitals, research buildings and infrastructure. This investment is enabling previously stand-alone research organisations to co-locate and collaborate more effectively, as illustrated by the Victorian Comprehensive Cancer Centre Project, the Melbourne Brain Centre and The Peter Doherty Institute for Infection and Immunity. The new facilities are transforming the ability of scientists to conduct complementary research, opening up exciting new research possibilities and accelerating research outcomes. In addition, new investments in shared research infrastructure in the Precinct, such as the new BlueGene/Q supercomputer in the Victorian Life Sciences Computational Initiative are leading to step changes in biomedical research capabilities.

WORLD-CLASS INFRASTRUCTURE SUPPORTS GLOBAL CANCER FIGHT

Melbourne Biomedical Precinct researchers are at the forefront of anti-cancer drug development. In the late 1980s, Walter and Eliza Hall Institute researchers discovered the function of a protein called BCL-2. When overproduced in cancer cells, BCL-2 makes them ‘immortal’. The discovery inspired 25 years of research at the Institute that has transformed our understanding of how cancers develop and survive. In partnership with two US pharmaceutical companies, the institute is now involved in clinical trials of an anti-cancer agent that was developed to overcome the effects of BCL-2, forcing the cancer cells to die. The agent, which is being tested worldwide, including at The Royal Melbourne Hospital and the Peter MacCallum Cancer Centre, is already showing promise for treating people with some blood cancers that have not responded to any other treatment.

REDUCING THE CHILDHOOD ALLERGY EPIDEMIC

Researchers from the Murdoch Children’s Research Institute are tackling childhood allergy on multiple fronts, investigating ways to reduce the disease burden of the allergy epidemic, which costs the community billions of dollars annually. They have shown that babies are less likely to develop egg allergies if given egg at 4–6 months of age than if they are given it at 12 months. Outcomes from this research will lower the financial and human cost of allergic and auto-immune disease.
DISCOVERING NEW TREATMENT PATHWAYS FOR CHILD AND ADOLESCENT CONDITIONS

Melbourne Children’s is a single campus housing The Royal Children’s Hospital, Murdoch Children’s Research Institute and the University of Melbourne Department of Paediatrics at a single, purpose-built and multi-award winning campus within the Precinct. From the bench to the bedside, this collaboration enables the discovery of new ways to treat complex child and adolescent conditions, and translate this knowledge into direct clinical care. Through education and training, Melbourne Children’s embeds knowledge, and the importance of discovery, in the next generation of paediatric specialists. From the discovery of the rotavirus in 1973 to Australia’s first successful paediatric intestinal transplant in 2012; from the world headline generating separation of conjoined twins Krishna and Trishna, to the official opening by Her Majesty The Queen, Melbourne Children’s is an iconic Melbourne institution and a world leader in paediatric health-science.

WORLDWIDE WEB PORTAL HELPS FIGHT RARE TUMOURS

Almost 20% of all cancers diagnosed are either rare or uncommon subtypes of common tumours, yet rare tumours are difficult to study because of the small number of cases of each tumour type. To address some of these limitations, BioGrid Australia developed CART-WHEEL.org, the first ethically-approved web portal for collecting patient information on rare tumours. Now through the internet, people everywhere can submit information about their rare tumour type. By pooling together these records, researchers can share information and develop new insights into rare tumours. This novel website has attracted international interest from both cancer patient groups and cancer researchers.
FOSTERING A CULTURE OF INTELLECTUAL CURiosity AND QUEST

The scale, depth and quality of Melbourne Biomedical Precinct research is astounding. Researchers collaborate within the Precinct and across Melbourne, Australia and the globe, together producing more than 5,500 publications annually. The University of Melbourne is the only Precinct partner authorised to confer degrees and each year educates over 7000 biomedical, health and medical students. It is greatly assisted in this by Precinct partners who share their knowledge by teaching into courses and supervising students.

HELPING CANCER PATIENTS RECOVER AFTER CHEMOTHERAPY

Colony stimulating factors (CSFs) are essential for boosting the production of white blood cells, which are needed by the body to fight infection. They were discovered at the Walter and Eliza Hall Institute in the 1960s and are now widely used in clinical medicine, predominantly in the treatment of cancer patients who have undergone chemotherapy. The use of CSFs has also revolutionised blood stem cell transplantation. To date, CSFs have benefited more than 20 million cancer patients worldwide. Recently, CSFs have been implicated in the development of chronic inflammatory diseases such as rheumatoid arthritis. Drugs that target CSFs for the treatment of this disease are now being developed through a collaboration between the Walter and Eliza Hall Institute and CSL, with the first clinical trials planned to run at The Royal Melbourne Hospital. An earlier collaboration between the Institute, CSL and MedImmune has resulted in a therapeutic antibody targeting cytokine receptors entering late stage clinical trials.

Professor Don Metcalf, AC, has led a 50 year research program that discovered colony stimulating factors, a research advance that has benefited millions worldwide.
The bionic ear, or cochlear implant, is a striking example of taking a concept from the laboratory through to clinical application, and is a local biomedical initiative with a global success story. Developed out of studies in the 1960s at the University of Melbourne, this device illustrates what can be achieved through a multidisciplinary research approach with support from government, other funding bodies and a commercial partner being involved in the developmental research. The Bionics Institute in Parkville made an outstanding contribution to the development of the cochlear implant. Now, bionics research is expanding into the development of neurobionics devices that treat neurological and psychiatric disorders, such as Parkinson’s disease and obsessive compulsive disorders.

Using a multidisciplinary approach, diabetes researchers at the University of Melbourne are taking research from the laboratory to the patient. They are researching the biology and genetics of diabetes, and collaborating with chemists and pharmacologists who are developing novel therapeutics, while engineers and nano-biotechnologists are creating supporting technologies such as monitoring devices. The delivery of state-of-the-art treatments and models of care to patients with type 2 diabetes is anticipated to result in a reduction in the onset and better management of this disease, leading to improved quality of life for patients and savings in public health budgets.
A LEADING INTERNATIONAL CLINICAL TRIAL SITE

Cutting-edge clinical research attracts and retains the very best clinicians in the Melbourne Biomedical Precinct. Because of this expertise and the culture of excellence and learning created by the research conducted in Victorian hospitals, hundreds of millions of dollars worth of clinical trial activity takes place in Victoria each year.

PETER MACCALLUM CANCER CENTRE MELANOMA TRIALS

The Peter MacCallum Cancer Centre was the only site outside North America to host a first-in-human clinical trial of a novel drug for advanced melanoma, vemurafenib. Following this, the Peter MacCallum Cancer Centre collaborated with health services across Victoria to further test the drug. Vemurafenib has now been approved for clinical use in the US, Europe and New Zealand.


CERVICAL CANCER VACCINE – LEADING THE WORLD WITH VACCINATION

The vaccine Gardisil®, which targets Human Papillomavirus types 6, 11, 16 & 18, is anticipated to substantially reduce the burden of cervical cancer, saving millions of women’s lives worldwide. This vaccine, which is based on science developed at the University of Queensland, was commercialised by CSL Ltd, in conjunction with Merck Sharp & Dohme. The Royal Women’s Hospital was the only Australian site for international phase III clinical trials of the vaccine. Associated research by the team at The Royal Women’s Hospital investigated the prevalence of Human Papillomavirus as well as the psychological and financial burden of genital warts that can result from HPV infection.
WORLD’S FIRST COELIAC DISEASE VACCINE

Researchers at the Walter and Eliza Hall Institute have developed the world’s first potential coeliac disease vaccine, offering hope to more than six million people with the debilitating disease. The vaccine, called Nexvax2®, was developed after researchers identified the three protein fragments in gluten that are toxic to people with coeliac disease. This vaccine has completed Phase 1 clinical trials in Australia, New Zealand and the US. Institute researchers are coordinating clinical studies that use patient samples to determine how the immune response goes awry to cause coeliac disease, and to explain why gluten makes people with coeliac disease sick. The Institute’s studies of a Victorian population have revealed that coeliac disease is far more common than previously recognised. Building on basic research discoveries about coeliac disease, the Institute’s coeliac researchers are also developing a new blood test that rapidly and accurately diagnoses this disorder, without the need for long periods of gluten exposure or biopsies.

BRINGING ABOUT NEW THERAPIES FOR CHILDREN

The Melbourne Children’s Trials Centre (MCTC) is a unique collaboration between Royal Children’s Hospital, Murdoch Children’s Research Institute, Royal Children’s Hospital Foundation and The University of Melbourne, bringing expertise in research from the Murdoch Children’s Research Institute, Clinical Practice from the Royal Children’s Hospital and Education from the University of Melbourne, Department of Paediatrics. The MCTC is built on the principles of quality, efficiency and innovation. The MCTC provides local investigators and industry with support for trials ranging from trials of novel therapeutic agents to large public health preventative trials. The MCTC has a dedicated and accredited space for early phase clinical trials and a large child friendly clinical area for low acuity studies. MCTC has staff to support each stage from idea, to protocol, design and running the trial. To be a leader in trials, MCTC has invested in developing innovative trial designs and innovative use of new technologies such as the new RCH Electronic Medical Record. The MCTC brings new therapies to Victorian Children and generates knowledge to better the health of all children.
PROXIMITY LEADS TO COLLABORATION AND INNOVATION

1 | THE UNIVERSITY OF MELBOURNE
WWW.UNIMELB.EDU.AU

The University’s biomedical and health sciences research is multi-disciplinary, cross-sectoral and places great emphasis on translational research and improving clinical outcomes. Teams of interdisciplinary scientists collaborate on a wide spectrum of activities – from fundamental research, to exploring particular health problems, to the development of new preventative and treatment methods, to the evaluation of the most effective and cost-efficient ways for re-configuring whole health systems. The University’s research in biomedical and health sciences is led by the Faculty of Medicine, Dentistry and Health Sciences (MDHS) and supported by research activities in Engineering, Law, Science and Veterinary Science. MDHS is Australia’s pre-eminent health sciences and biomedical faculty and in the top 20 research entities internationally where it is recognised for clinical, pre-clinical and health sciences research, for teaching and training and for policy leadership. MDHS has strong collaborative links not only within the Melbourne Biomedical Precinct, but also with many leading national and global research institutes, clinical centres and health-related industries.

2 | WALTER AND ELIZA HALL INSTITUTE
WWW.WEHI.EDU.AU

Founded in 1915, the Walter and Eliza Hall Institute is Australia’s oldest medical research institute. The institute’s multi-disciplinary research teams are developing new approaches to the prevention and treatment of cancer, immune disorders and infectious diseases through basic, translational and clinical research. The institute is closely affiliated with The Royal Melbourne Hospital and The University of Melbourne and offers postgraduate training as the university’s Department of Medical Biology. It is a founding member of the new Victorian Comprehensive Cancer Centre, Biomedical Research Victoria, the medical informatics company BioGrid, the Melbourne Genomics Health Alliance and Cancer Trials Australia. A major redevelopment of the institute’s main campus in Parkville was completed in 2012. The Institute also operates a biotechnology centre in La Trobe University’s Research and Development Park, Bundoora.
Melbourne Health delivers world-class healthcare and clinical research to the community through The Royal Melbourne Hospital – one of Australia’s pre-eminent hospitals, NorthWestern Mental Health – the largest mental health provider in Victoria, and the internationally renowned Victorian Infectious Diseases Reference Laboratory (VIDRL). Melbourne Health is built on a tradition of providing the best possible care for our patients, excellent teaching and training for staff and future health professionals, and a commitment to clinical research to improve outcomes for everyone in the community. The Royal Melbourne Hospital is an acute tertiary institution offering comprehensive general and specialist medical and surgical services. The hospital is one of two adult major trauma centres in the State and home to the Victorian Infectious Diseases Services. An enduring partnership of almost 150 years exists between the Royal Melbourne Hospital Clinical School and the University of Melbourne. The partnership with the Faculty of Medicine, Dentistry and Health Sciences fosters a culture of excellence and innovation and helps drive improved patient outcomes.

The Royal Women’s Hospital (the Women’s) is Australia’s largest specialist hospital dedicated to improving the health of all women and newborns. It is one of the last independent women’s hospitals in the world. The Women’s is a state-wide tertiary hospital for women and newborns with complex needs in addition to providing services for its local area. The Women’s clinical services can be broadly grouped into maternity, neonatal, gynaecology, and cancer services. For more than 150 years, the Women’s has led the advocacy and advancement of women’s health care and supports its research programs through six centres of excellence; the Women’s Gynaecology Research Centre, the Centre for Women’s Infectious Diseases, Centre for Women’s Mental Health, Women’s Cancer Research Centre, the Women’s Newborn Research Centre and the Women’s Pregnancy Research Centre. The hospital is also a founding member of the new Victorian Comprehensive Cancer Centre.
PROXIMITY LEADS TO COLLABORATION AND INNOVATION

5  |  THE ROYAL CHILDREN’S HOSPITAL (RCH)
WWW.RCH.ORG.AU

The Royal Children’s Hospital is Victoria’s major paediatric hospital, providing care to children and adolescents from around Australia and the Asian-Pacific region for over 142 years. RCH is recognised internationally as a leading centre in research and education. It provides a full range of services and programs including: clinical services and tertiary care, academic teaching, illness prevention and advocacy programs, together with state-wide paediatric services such as rehabilitation, palliative care, forensic medicine, hearing screening, an orthopaedic network, and state-wide paediatrics major trauma services for the whole of Victoria. It is also a nationally funded centre for cardiac and liver transplantation, and the surgical treatment of hypoplastic left heart syndrome. The RCH is a member of the Victorian Comprehensive Cancer Centre, contributing deep expertise in children’s cancers with links to adult cancer programs. The University of Melbourne RCH Academic Centre incorporating The Department of Paediatrics is part of The Melbourne Medical School, within the Medicine, Dentistry and Health Sciences Faculty. It manages state of the art education utilising a full simulation centre and comprehensive video-conferencing facilities, and in conjunction with campus partners delivers post graduate courses in adolescent health and welfare, and genetic counselling.

6  |  THE MURDOCH CHILDREN’S RESEARCH INSTITUTE
WWW.MCRI.EDU.AU

Murdoch Children’s Research Institute is Australia’s leading child health research organisation. The world-class team of over 1500 researchers are dedicated to making discoveries to prevent and treat common and rare childhood conditions. Researchers at the Institute operate over three areas; laboratory work to understand how diseases form, clinical research working side-by-side with paediatric doctors and nurses to influence diagnosis and treatment and broad population health studies to understand how disease impacts children in the wider community. Working across five main research themes and five major cross-disciplinary research programs, the Institute conducts nationally and internationally recognised studies to make genuine changes to the delivery of health and education. Working side-by-side with the health professionals and academics at The Royal Children’s Hospital and the University of Melbourne’s Department of Paediatrics gives researchers a unique ‘bench to bedside’ opportunity, enabling us to more quickly translate research discoveries into practical treatments for children.
The Peter MacCallum Cancer Centre is Australia’s only public hospital solely dedicated to cancer and one of an elite group of cancer hospitals worldwide with embedded research laboratories, which are uniquely integrated with extensive clinical and cancer experiences research programs. Every year, Peter Mac provides compassionate care and treatment for around 30,000 people with cancer, while supporting their families and carers. From the laboratory to the clinic and back again, more than 520 laboratory scientists, clinician-researchers, research nurses and other health professionals at Peter Mac are determined in their efforts to find better treatments to improve the lives of people with cancer, establishing new standards of care, defining practice in use of diagnostic and treatment technologies, contributing new knowledge to the global understanding of cancer and leading many world-first clinical trials of new and improved treatments. In 2016, Peter Mac’s main site will relocate to a brand new $1.1 billion facility purpose-built for cancer care, cancer research and cancer education in Parkville.

The Florey Institute of Neuroscience and Mental Health is one of the world’s leading brain research centres. Employing more than 500 staff and educating in excess of 100 post-graduate students each year, the Florey Institute comprises the largest neuroscience research team in Australia. Research teams work on a range of serious diseases including stroke, epilepsy, Alzheimer’s disease, Parkinson’s disease, multiple sclerosis, Huntington’s disease, motor neuron disease, traumatic brain and spinal cord injury, depression, schizophrenia, mental illness and addiction. The Florey Institute is a world leader in imaging technology, stroke rehabilitation and epidemiological studies.

CSIRO, the Commonwealth Scientific and Industrial Research Organisation, is Australia’s national science agency and one of the largest and most diverse research agencies in the world. Research at the CSIRO Parkville site is focussed on human health through the CSIRO Future Manufacturing Flagship. CSIRO develops new chemical and biological technologies and materials to address national challenges in health, security, energy and manufacturing. Scientists work closely with both academic and industry partners across a number of biomedical research areas including drug development, therapeutic recombinant proteins and antibody targeting. Programs are supported through key on-site capabilities in molecular and cell biology, and in protein expression, modelling and structure and crystallisation. Additionally, through its national network, and particularly the Food and Nutrition and Digital Productivity Flagships, CSIRO works to improve the health and wellbeing of Australians drawing on its nutrition, lifestyle, informatics and large data analytics capabilities.
The Victorian Comprehensive Cancer Centre (VCCC) is a multi-site, multi-disciplinary centre bringing together a critical mass of cancer experts dedicated to the use of new research discoveries to accelerate improvements in prevention, patient care and education on a large scale. The new cancer program links the work of ten leading Melbourne-based institutions, all working together to accelerate the control and cure of cancer – The Peter MacCallum Cancer Centre, Melbourne Health, The University of Melbourne, The Walter and Eliza Hall Institute of Medical Research, The Royal Women’s Hospital, The Royal Children’s Hospital, Western Health, St Vincent’s Hospital – Melbourne, Murdoch Children’s Research Institute and Austin Health (incorporating the Olivia Newton-John Cancer and Wellness Centre). The VCCC bolsters the global competitiveness of these member organisations creating a critical mass that can overcome the problems of scale and geography to attract international clinical trials. Based on the world-class model for excellence of cancer centres in the United States, the VCCC strives to save lives through the integration of cancer research, education and patient care. Through innovation and collaboration, the VCCC will drive the next generation of improvements across key elements of effective cancer control and care, addressing cancer prevention, early detection of cancer, treatment and management of cancer, research into cancer and its translation, cancer education and training, and cancer information. Through collaboration, integration and innovation these programs will result in exciting discoveries and therapeutic breakthroughs that will contribute to the transformation of cancer care.

The Melbourne Brain Centre is Australia’s largest brain research collaboration. The partners include:

- The Florey Institute of Neuroscience and Mental Health
- Melbourne Neuroscience Institute (part of the University of Melbourne)
- Melbourne Brain Centre @ Royal Melbourne Hospital (a centre for translational research)
- Austin Health – a major hospital that is a 20 minute drive from the Parkville campus.

Researchers from the Florey Institute and the University of Melbourne are co-located in purpose-built laboratories in Parkville, opposite the Royal Melbourne Hospital, and in Heidelberg, adjacent to Austin Hospital. The power-house of intellectual capacity created through the combined research strength of the group makes it one of the top five centres for brain research in the world. Collaboration is stimulating rapid growth in research and enabling scientific discovery and the development of improved treatments leading, ultimately, to cures for brain and mind disorders. Translational opportunities are enhanced by proximity to inpatients and powerful imaging capabilities through a 7-tesla MRI and PET-CT. State-of-the-art services are available to external researchers including human and animal MRI, PET-CT scanning, advanced microscopy, histology and fluorescence-activated cell sorting.
The Doherty Institute is a partnership between the University of Melbourne and Melbourne Health. The vision for the Doherty Institute is to create a world-class institute combining research into infectious disease and immunity with teaching excellence, reference laboratory diagnostic services, epidemiology and clinical services. Importantly, it will also monitor the growing number of drug-resistant diseases in hospitals and the community at large. This work significantly strengthens our national and global capacity to detect, verify, investigate and respond to existing, emerging and re-emerging infectious diseases and agents, with a major focus on diseases that pose serious public health threats. Doherty Institute researchers will collaborate with experts from other internationally respected organisations, including the World Health Organisation Collaborating Centre for Reference and Research on Influenza, the Nossal Institute for Global Health and the Victorian Infectious Diseases Reference Laboratory.

The VLSCI is a transformational investment by the Victorian Government and the University of Melbourne that is bringing peak computing capabilities to Victoria’s life sciences researchers and their collaborators. Other major stakeholders include key Victorian health and medical research institutions, major Universities and public research bodies. This peak computing facility operates at the petascale and includes an IBM BlueGene/Q system. Researchers and computer scientists are using this tool to solve some of the biggest challenges facing Australia’s health system. They are assisted in this work by VLSCI’s team of over 20 computational biologists and 10 computer systems experts working across fields such as bioinformatics, computational imaging and molecular modelling. After only a few years of operation, VLSCI experts have been named on many high profile bioinformatics papers, and been responsible for attracting millions of dollars in national and international funding, and contributed to several patents.

Victorian researchers have contributed to improving the lives of millions of people and their work is an important driver of economic development in the State. Biomedical Research Victoria (BioMedVic) is the peak body for organisations that contribute to this internationally-recognised research community, providing a collective voice for advocacy and a structure for promoting collaboration and innovation. Representing universities, teaching hospitals, medical research institutes, CSIRO and other research organisations, many of which are located in the Precinct, BioMedVic seeks to develop shared vision, long term plans and better links between government, industry and the biomedical community to enable biomedical research to flourish in Victoria, compete successfully alongside other global life sciences centres and to better use existing resources for the creation of new knowledge, new treatments, and new commercial opportunities.
The Bio21 Institute, one of Australia’s largest multidisciplinary research centres, is focused on improving health and the environment through biotechnology innovation and industry engagement. The Institute specialises in biomedical, agricultural and environmental biotechnology underpinned by expertise in structural and cell biology, chemical biology and nanobiotechnology. It provides critical mass and expertise in open-access core platform technologies including nuclear magnetic resonance spectroscopy, mass spectrometry, proteomics, metabolomics and advanced light and electron microscopy. Facilities are extensively utilised by broad academic and industry researchers in the Precinct and Victoria. Institute researchers have close links with medical research institutes, hospitals, and industry which includes co-located industry members and a BioIncubator. The Institute recognises that technology transfer and commercialisation are facilitators of skills development and economic and community outcomes. The Institute is closely linked to science education and training including inspiring the next generation with the vision of a ‘School to Bench to Workplace’ model, demonstrated through the new Elizabeth Blackburn School of Sciences initiative in the Precinct.
St Vincent’s Institute (SVI) is an independent medical research institute, operating as part of St Vincent’s Health Australia under the stewardship of the Mary Aikenhead Ministries. SVI is affiliated with Melbourne’s St. Vincent’s Hospital and the University of Melbourne. The Institute conducts collaborative research into the cause, prevention and treatment of type 1 and 2 diabetes; obesity and heart disease; arthritis and osteoporosis; cancer; infectious diseases and Alzheimer’s disease. Institute researchers are internationally recognised for their work into the pathways of communication in bone, understanding the body’s energy sensing pathways, establishing new treatments for type 1 diabetes and for applying leading-edge technology to the study of protein structure and function. SVI provides a valuable service to clinical medicine, graduate education and community health via its role as host of the National Serology Reference Laboratory and membership of Biomedical Research Victoria and St. Vincent’s Diabetes Centre of Clinical Excellence.

DHSV is funded by the Victorian Government to deliver public oral health services to the most vulnerable community members across the state. DHSV provides oral health care through The Royal Dental Hospital of Melbourne and purchases dental services from community dental agencies located across Victoria. DHSV advises government on policy, funding and service development, delivers oral health promotion programs and supports evidence-based practice, research and innovation across all aspects of the public oral health sector.

At Orygen, the leadership and staff work to deliver cutting-edge research, policy development, innovative clinical services, and evidence-based training and education to ensure that there is continuous improvement in the treatments and care provided to young people experiencing mental ill-health. The Orygen team’s work has created a new, more positive approach to the prevention and treatment of mental disorders, and has developed new models of care for young people with emerging disorders. This work has been translated into a worldwide shift in services and treatments to include a primary focus on getting well and staying well, and health care models that include partnership with young people and families.

The National Ageing Research Institute (NARI) is an independent, not-for-profit research institute, recognised internationally as a leading centre of excellence in research into ageing and quality of life and health of older people and for its significant expertise in qualitative and quantitative methods. NARI research is concentrated in key divisions which span biomedical and clinical perspectives, public and preventive health and service development and evaluation. The Institute has a strong track record in translational research and at any one time is managing over 60 research projects. NARI also teaches undergraduate and postgraduate students from the University of Melbourne and other universities and delivers a range of educational and professional development workshops to allied health and other professionals Australia-wide in the ageing field. NARI is closely networked in with Victorian, Australian and International ageing research sector and collaborates extensively with other organisations.
PROXIMITY LEADS TO COLLABORATION AND INNOVATION

22 | CENTRE FOR EYE RESEARCH AUSTRALIA (CERA)  WWW.CERA.ORG.AU

CERA conducts eye research with real-life impact; unravelling the causes of eye diseases, preventing blindness through earlier diagnosis and better treatments, and restoring sight. CERA is closely affiliated with the University of Melbourne Department of Ophthalmology, and is co-located with the Department at the Royal Victorian Eye and Ear Hospital. This three-way partnership between CERA, the University and the Hospital, is key to the successful translation of eye research from the bench to the bedside. CERA’s ultimate goal is to find solutions for the three major blinding eye diseases that affect Australians – macular degeneration; glaucoma and diabetic eye disease – and to pioneer vision regeneration programs to give hope to people who have lost their sight.

24 | MONASH INSTITUTE OF PHARMACEUTICAL SCIENCE, MONASH UNIVERSITY (PARKVILLE CAMPUS)  WWW.MONASH.EDU/PHARM

Monash University’s Faculty of Pharmacy and Pharmaceutical Sciences is located at the northern end of the Parkville strip and is home to more than 1800 undergraduate and postgraduate students. Established in 1881, the faculty has a long history of providing quality education and today, is one of the top pharmacy and pharmaceutical sciences schools in the world, leading the way in innovative and engaging pharmacy and pharmaceutical science education. The Faculty houses the Monash Institute of Pharmaceutical Science (MIPS) which shares close links with a many leading Australian and international research organisations and institutes. MIPS is Australia’s leading research in the pharmaceutical sciences including translational drug discovery, drug delivery and drug development. Pharmacy and Pharmacology at Monash is ranked number one in the Asia-Pacific and top 10 worldwide (2014 QS World University Rankings). The Faculty also houses the Centre for Medicine Use and Safety (CMUS) which is focused in the research fields of medicine use and policy, pharmacoepidemiology, and the quality use of medicines.

23 | BIONICS INSTITUTE  WWW.BIONICSINSTITUTE.ORG

The Bionics Institute (BI) is a leading independent medical research institute working in the field of medical bionics. The Institute’s multidisciplinary approach combines basic and applied science with medicine and engineering to develop innovative methods for addressing major health issues with high levels of success. The BI has made an outstanding contribution to innovation in health and industry through involvement in the development of the cochlear implant (bionic ear) and, more recently, through Australia’s first prototype bionic eye device. The BI designed, produced, tested for safety and efficacy, and then ‘switched on’ the first suprachoroidal bionic eye device as part of the Bionic Vision Australia consortium. This prototype device was successfully implanted in three volunteers in 2012, with the BI undertaking the subsequent psychophysics work to evaluate the visual perceptions evoked by the device. The BI is also working on an advanced brain stimulation device designed to provide relief for people suffering from otherwise intractable forms of epilepsy, Parkinson’s disease, essential tremor, obsessive compulsive disorder, and other conditions. The BI is a not-for-profit organisation affiliated with The University of Melbourne, with the Medical Bionics Department located on the premises. A subsidiary company, Bionic Enterprises Pty Ltd, has been established to commercialise the BI’s products.

25 | BIOGRID AUSTRALIA  WWW.BIOGRID.ORG.AU

BioGrid Australia is an innovative health informatics research platform that facilitates privacy-protected research across many hospitals and medical research institutes. BioGrid provides an online Access Request System by which researchers can apply for access to specific health databases, such as cancer, diabetes, epilepsy and rare tumours. While BioGrid manages applications for data access, data custodians retain complete control over access to their data. A Scientific Expert Review Committee assesses the proposed investigation and ethics approval from a properly constituted Human Research Ethics Committee is required before BioGrid will provide data access. Once authorised, researchers can access de-identified data for specified research.
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Precinct Map adaptation courtesy of the University of Melbourne. This booklet was produced by Melbourne Health on behalf of the nine Precinct Partners. All information included was correct as at September 2014.
Melbourne Biomedical Precinct

WORLD LEADERS IN MEDICAL RESEARCH, EDUCATION AND TREATMENT

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