

**Engineering the
future of healthcare**

**The Aikenhead Centre
for Medical Discovery**



ACMD

Transforming the future of healthcare

At the Aikenhead Centre for Medical Discovery (ACMD) we are accelerating medical innovation through biomedical engineering research and education.

The ACMD will be a global leader in the use of new technologies to develop healthcare with life-changing solutions. Artificial intelligence, implantable digital devices, regenerative medicine, and 3D-printing are among the pioneering technologies our ACMD researchers are using to shape research with long-term impact.

A multidisciplinary approach underpins the ACMD vision. The strong and positive partnerships forged through the ACMD between universities, research institutes, government and industry, and St Vincent's provide the platform to solve the future challenges of chronic illness, ageing, healthcare access, economics, and workforce.

Backed by the State and Federal Governments and valued philanthropic and industry partners, we are harnessing the combined strengths of clinicians, scientists, and engineers to problem-solve and lead the way in medical breakthroughs.

"Melbourne is the medical research capital of Australia – this new centre will cement our place as a world leader in medical discoveries and scientific breakthroughs."

Premier Daniel Andrews



A bold new future

From its inception, the ACMD has been driven by one of Australia's leading healthcare providers, St Vincent's Health Australia. Through the work of its co-located institutes and hospitals, St Vincent's offers one of Australia's largest medical research ecosystems.



A state-of-the-art research centre

Co-located at St Vincent's Hospital Melbourne's Fitzroy campus, the new 11-storey building will include 3D-printing laboratories, a human kinetics lab, and insulated rooms for developing sensitive hearing and vision technologies.

An education hub will help nurture future clinical, nursing, allied health, and biomedical research innovators and leaders. It will provide both clinical and engineering graduates with the knowledge and skills to understand and solve major health problems with direct application to patients.

The space will incorporate multiple seminar and tutorial rooms, a clinical simulation laboratory, and a large lecture theatre extending over two levels.

Scheduled for completion in late 2024, the ACMD will become a national centre for future health research, advocacy, and equitable healthcare.

The ACMD will energise the medical technology industry in Victoria like never before, and lead to better health outcomes for Victorians and all Australians.

Apart from driving innovations that create value and improve patient lives, the ACMD will boost skills and build a vibrant health technology industry.

Importantly, the ACMD will support innovators to navigate the research pathway to fast-track delivery of research solutions and significantly reduce failure rates.

On-site, medical and nursing schools embedded within the new \$206 million building will rapidly enhance and share clinical, technology, commercialisation, and IP skills.

As our partnership charts the future of healthcare through biomedical engineering research and teaching, we invite you to join us. We welcome conversations on how, together, we can increase our impact.

Pushing the boundaries

Implant to monitor seizure activity

An implant (above left) designed to monitor brain seizure activity using a long-term Electroencephalogram (EEG) monitoring system is the focus of a research study that aims to track seizure patterns via a series of electrodes powered by an external device that hooks neatly over the ear.

Using unique cloud-based technology, the data obtained is sent to the patient's mobile phone, and from there, is uploaded for the clinician to analyse. It is hoped this technology will better detect, report, and forecast patient seizures without them needing to come in for regular hospital-based analysis.

Abdominal pump to treat drug-resistant focal seizures

A targeted delivery of anti-seizure medication – straight to the brain via a long-term abdominal pump implant – is being assessed with an aim to eliminate previous issues experienced with drug absorption and uptake barriers.

The treatment being investigated hopes to offer improved management of seizures, decrease their frequency, and improve the quality of life and wellbeing for people with epilepsy prone to drug-resistant focal seizures.

Artificial intelligence to improve breast cancer screening

Artificial intelligence is being used to analyse mammograms with the aim to improve the accuracy of breast-cancer screening. The new AI-based models being investigated hope to better detect cancer, lower unnecessary patient recalls to assessment, and improve timeliness, efficiency and participation.

The research also examines the potential to use AI models to better predict the risk of breast cancer and enable the tailoring of the screening program to women at higher risk.

3D-printed stem cells

The Axcelda pen (top) is a device that enables surgeons to implant 3D-printed stem cells directly into the damaged cartilage area to prevent osteoarthritis development. It is one of several world-first translational research projects to tackle chronic illness being co-developed by a large group of organisations, including four ACMD partners.



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