



Medical research conducted at the Australian Synchrotron has the potential to save the Australian health care industry millions of dollars every year.

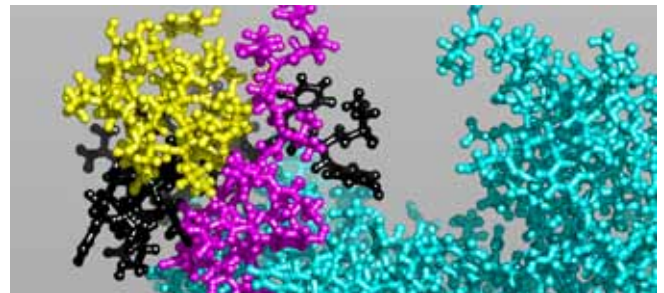
The Australian Synchrotron is one of the most important landmark research infrastructure platforms in the southern hemisphere. Thousands of Australian and international researchers using the unique properties of synchrotron light to deliver new insights to support Australian health by delivering better outcomes, more cost effective treatments and drugs with fewer side effects.

More cost effective diabetes treatment

Diabetes is Australia's fastest growing chronic health condition, affecting more than one million Australians and costing around \$10 billion a year. In a collaboration with Monash University, the Australian Synchrotron's Macromolecular Crystallography beamlines provided the world's first 3D image of insulin in action – crucial to developing synthetic insulin that does not require refrigeration.

X-ray vision for medical research

The Australian Synchrotron's newly commissioned flagship Imaging and Medical Beamline (IMBL), one of just three such facilities in the world, is offering researchers unprecedented detailed images of living tissues in far greater detail than those achieved using magnetic resonance imaging (MRI). In a first for Australia, the IMBL will enable scientists to take a live, 3D image of a breathing person in unprecedented detail, as well as track the movement of cells through tissues in real time providing direct clinical applications. It is also envisaged that the new beamline will enable clinicians to develop new treatments, including a new form of radiation therapy that will target tumor cells while sparing healthy tissue.



The Australian Synchrotron produced the world's first 3D image of the insulin molecule in action.

New treatment for influenza

Tens of thousands of Australians are diagnosed with influenza every year, with many requiring hospitalisation and treatment in Intensive Care. Using the Macromolecular Crystallography beamlines, an international team of researchers including the CSIRO have developed a potential new flu treatment that could quickly bring flu outbreaks under control and limit the virus' ability to mutate and defend itself against treatment. The study has shown how the new drug interacts with the virus, informing the development of a potential new treatment.

Helping millions living with HIV-AIDS

The brightness of synchrotron X-rays have helped to determine the three-dimensional structure of an AIDS virus protein in a matter of minutes instead of days. The Macromolecular Crystallography beamlines and X-ray Absorption Spectroscopy beamline were used by researchers from St Vincent's Institute, Monash Institute of Pharmaceutical Sciences identify a previously unknown binding pocket on a HIV-infected cell that contributes to the virus' ability to become resistant to current drugs. This knowledge could help researchers design new drugs and help over 30 million people living with HIV-AIDS.