

CHEMISTRY AND BIOTECHNOLOGY

Swinburne's Department of Chemistry and Biotechnology brings together research expertise and world-class infrastructure to support applied and industrial research in chemistry, environmental science and biotechnology.

The Department of Chemistry and Biotechnology promotes the development of applied and industrial research in chemistry, environmental science and biotechnology. Our research is ranked "well above world standard" in the area of Physical Chemistry, as recognised by the Australian Research Council's 2018 Excellence in Research in Australia.

AREAS OF RESEARCH FOCUS

Our research activities are divided into three key areas:

- **Environmental Biotechnology and Sustainability:** bioremediation, water quality, microbial ecology, inorganic catalysis, food safety, pharmaceutical development and manufacturing.
- **Molecular Biotechnology** - plant biotechnology, recombinant protein technology, molecular virology and molecular modelling.
- **Physical Chemistry and Polymers** - production and characterisation of bioactive compounds, biochemical systematics, microbial enzymology, biopolymers, nanotechnology and biomaterials.

RESEARCH FACILITIES

Swinburne's chemistry and biotechnology laboratories support applied and industrial research in chemistry, environmental science and biotechnology. All staff and students have access to high quality equipment and instrumentation, state-of-the-art chemical and biological laboratories as well as access to state-of-the-art national infrastructure such as supercomputers, the Australian Synchrotron and the Australian National Fabrication Facilities (www.anff.org.au).

RESEARCH HIGHLIGHTS

Colloidal crystals meet stem cells: Peter Kingshott and George Wang have shown that surface micro- and nanostructures based on self-assembly of particles into highly ordered arrays can control how stem cells behave. These surfaces have potential to make new types of cells that can potentially be used to repair damaged organs in tissue engineering and regenerative medicine.

Agricultural and environmental biotechnology: Mrinal Bhawe and her collaborators including Enzo Palombo and Francois Malherbe work on biochemical and molecular studies of major crop plants such as wheat and barley, to discover factors that affect grain quality, plant survival under adverse environmental conditions such as drought and salinity, and novel products such as antimicrobial peptides.

Development of a new and unique super high oleic bio-based oil: Aimin Yu, Feng Wang and Enzo Palombo have started a new large project funded through the Australian Government's Cooperative Research Centre Projects (CRC-P) scheme. In partnership with industry they will develop a unique biodegradable and renewable oil, produced from safflower that has the potential to replace fossil fuel oils based such as lubricants and plastics.

Contacts

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