Cooperative Research Centre for

Polymers

Cooperative Research Centre for
Polymers
Solutions for a better world

Introducing the

CRC for Polymers

Our Vision

The Cooperative Research Centre for Polymers (CRC-P) is conducting leading-edge polymer research to deliver the advanced polymeric materials and polymer engineering required to transform Australian industries and to establish and expand companies in emerging high-growth areas of the economy.

Our Organisation

The CRC for Polymers brings together world competitive teams including researchers from ten universities, CSIRO and ANSTO, and industry participants ranging from large multinationals through to Australian SMEs and technology start-up companies. Its activities aim to develop functional, high-value specialty polymers for emerging high growth industries.

What is a CRC?

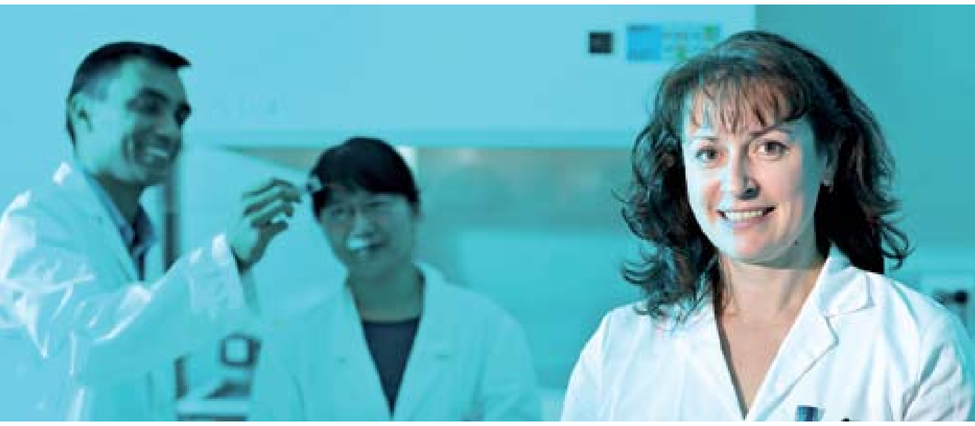
Unique to Australia, the Cooperative Research Centres Program was established by the Federal Government in 1990 to strengthen collaborative linkages between industry and the Australian research community. Industry-based CRCs undertake collaborative research driven by identified industry needs, and then transfer the resultant knowledge and technology to deliver economic, social and environmental benefits to Australia. CRCs also play a significant part in industry-specific postgraduate education and training. Today there are over 50 CRCs which operate in six sectors of the economy: manufacturing, information & communication, mining & energy, agriculture & rural based manufacturing, environment, and medicine.

Our History

The Centre was established under the Australian Government's CRC Program in 1992. It operated as the CRC for Polymer Blends until October 1996, when it broadened the scope of its research to become the CRC for Polymers. Successful applications for further funding from the CRC Program have supported its continued operation from July 1999 to June 2005 (with a grant of A$15 million) and from July 2005 to June 2012 (with a grant of A$32 million).

About the CRC for Polymers

Today the CRC-P is an incorporated joint venture between its current participants that include companies, universities and government research organisations. It is managed by Polymers CRC Ltd, a company limited by guarantee. The CRC-P is governed by an independent Board, with the day-to-day activities managed by the CEO and Program Leaders. The Centre receives grant funding from the Australian Government and our participants contribute cash and in-kind resources to the Centre. The annual budget is approximately A$19 million. These resources are primarily deployed on the Centre's research and commercialisation activities, as well as education and administration programs. The CRC-P provides funding for approximately 50 research positions at its research nodes at 10 universities, CSIRO and ANSTO. The Centre will also be providing scholarship funding support for approximately 40 postgraduate students. During its current seven year funding period the CRC-P will invest approximately $130 million in research and related activities.



Our Activities

Research The CRC-P has four research programs: Biomedical Polymers, Advanced Polymeric Materials, Polymers for Sustainable Development, and Design and Engineering.

Commercialisation The translation of the Centre's research into commercial products is made possible by partnerships with our industrial participants, intellectual property protection, market intelligence and competitor analysis.

Education & Training The CRC-P provides broad training to its polymer researchers and postgraduate students with courses on R&D leadership, project management, IP and commercialisation. It co-sponsors the annual Australasian Polymer Summer School, hosts a number of workshops and offers an annual prize for outstanding undergraduate research projects. Together with the funding of PhD students, and the sponsorship of local polymer conferences and events, the CRC-P seeks to enhance Australia's polymer expertise.

Working with us

The Centre fosters long term collaborative relationships between public sector research organisations and industry. The collective synergy of our teams gives us the capacity to undertake projects of greater scale and potential impact. Commercial arrangements are structured in order to facilitate knowledge transfer, with focus on the development of technology platforms, and product development and commercialisation.

Our Partners

Advanced Polymerik

Australian Nuclear Science & Technology Organisation (ANSTO)

Australian Stem Cell Centre

BHP Billiton Innovation

Birchip Cropping Group

Carl Zeiss Vision Australia

Ceram Polymerik

Ciba Specialty Chemicals

Commonwealth Scientific & Industrial Research Organisation (CSIRO)

Integrated Packaging Australia

Moldflow

Monash University

Plantic Technologies

Pfizer Australia

Queensland University of Technology

RMIT University

State of Victoria

Swinburne University of Technology

University of Melbourne

University of NSW

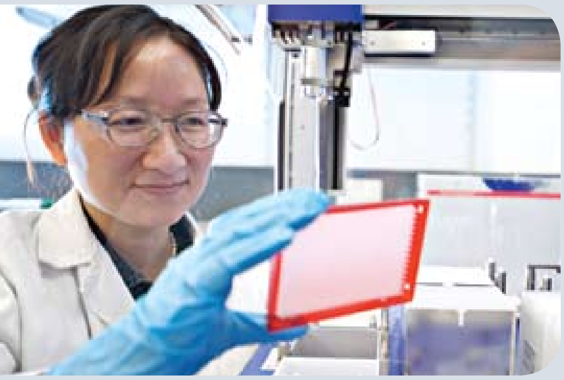
University of Queensland

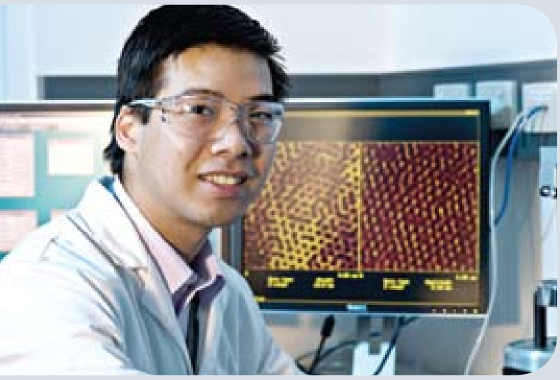
University of South Australia

University of Sydney

University of Wollongong

Our Research





The CRC for Polymers brings together collaborative teams comprising Australian polymer researchers, drawn from a range of universities and government laboratories, alongside leading scientists from its industry participants. These extensive research linkages span Australia with some project activities also occurring overseas. The research activities of the CRC-P are grouped into four programs.

Biomedical Polymers

This program consists of projects which combine biotechnology with polymer science in order to achieve the technology developments necessary for growth in this industry.

Biopolymer nanoparticles for single dose delivery of vaccines

Research in this project is targeted at developing a single dose vaccine delivery system based on biopolymer nanoparticles for use in animal health applications. Preparation of single dose vaccines is challenging because of the requirement to have both an initial pulse release of vaccine at injection and a delayed pulsed release one or more months later.

Functional polymer-based microenvironments for controlling cell function in biomanufacturing

This project is developing synthetic microenvironments to control cell function for use in biomanufacturing. Cell response is greatly attenuated in environments typically used in contemporary biomanufacturing. Synthetic functional polymer-based microenvironments (smart surfaces), containing the biological information and spatial arrangements tailored for a given function, could be used to enhance efficiency of many industrial biomanufacturing processes. In bioreactors, these smart surfaces could be used to direct cell propagation and differentiation to produce uniform populations of cells for therapies.

Collaborative research at the interface of
polymer science and biology

Advanced Polymeric Materials

This program is focused on delivering advanced polymeric materials required to underpin growth in diverse, but well-established areas of industrial and economic activity such as passive fire protection, optical and photoactive materials, and mining extraction processes.

Enhanced ceramifying polymers

The objective of this research is to develop enhanced ceramifying polymer materials for passive fire protection applications. These materials are processable and functional, with properties similar to standard plastics and rubbers, but when exposed to fire, they transform to a porous ceramic material that acts as a fire barrier.

Nanoengineered materials

This project is developing nanoengineered polymer-based photoactive materials, producing specialty additives and creating technologies which alter the microenvironment of active materials in polymer matrices. Tailored specialty polymers and nanoparticles can significantly influence both the chemical and physical behaviour of active materials. The potential applications of this technology are wide, with the research in this project currently directed towards additives for novel materials designed for use in holographic data storage, photochromic dyes and laser marking.

Polymer additives for improving nickel extraction processes

This research is developing a functional polymer additive that changes the surface properties of talc selectively to aid its separation during the nickel extraction process. The tendency of talc to float reduces the efficiency of many nickel extraction processes and the addition of natural polymers such as guar give a positive effect. The project seeks to understand how such natural polymers function so that synthetic versions can be designed to maximise the efficiency of the nickel extraction process.

Our Capabilities

Long standing experience in research project management and product delivery

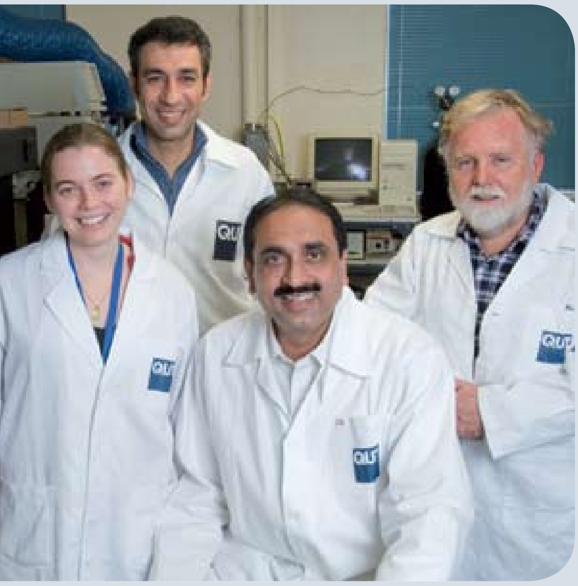
Intellectual property development, strategy and portfolio management

Commercialisation including technology transfer to industry partners, licensing and spin out company establishment

Access to state of the art scientific equipment

Ability to bring together teams with cross functional technical expertise spanning the spectrum of polymer science and engineering with niche specialities in biomedical, ceramifying, electro & optically active, and degradable polymers.

Our Research



Polymers for Sustainable Development

This program will provide sustainable products and materials based on polymer science and engineering to assist in transforming our use of land, water and energy resources.

Functional polymers for photovoltaic devices

The research objective is to synthesise an efficient, transformable polymeric photovoltaic material. Solar cells are a fast growing segment of the energy market and traditional photovoltaic materials are based on silicon, limiting applications to rigid constructions. An all-polymer solar cell would be transformable to required shapes by low cost polymer processing techniques.

Degradable packaging materials derived from renewable resources

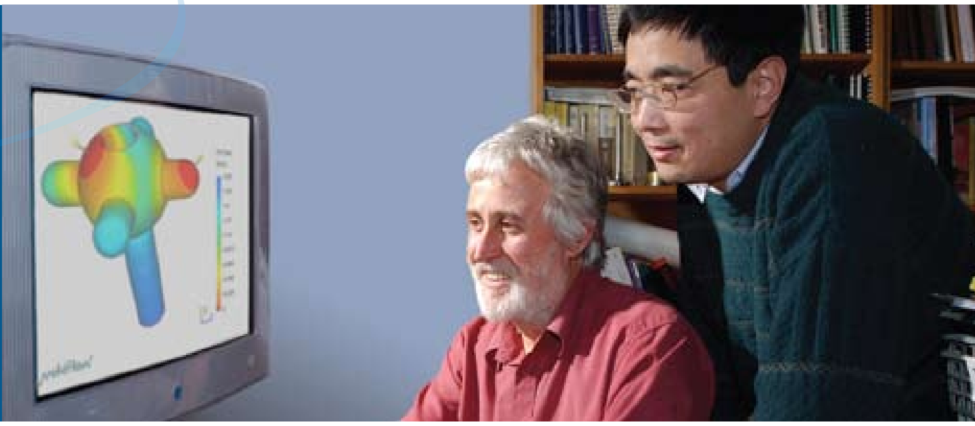
This research is directed towards modifying polymers derived from renewable resources to achieve the processing, gas barrier, water resistance, biodegradation and mechanical properties required to enable the wider use of these materials in packaging applications.

Degradable polyolefin films for agricultural production

This research is developing stretched polyolefin films for use in horticultural and agricultural crop production that will photo-degrade in a controlled way during, or at the completion of, the growing cycle and so enhance water retention and yields.

Polymers for evaporation mitigation technologies

Evaporation from large water storage reservoirs is a major issue, especially in times of extended drought. Chemical ultra-thin films provide an attractive potential solution. This project is an alliance between three CRCs: Polymers, Irrigation Futures, and Cotton Catchment Communities. The team is developing a cost-effective, easy to apply product that will produce ultra-thin films with evaporation control performance at least 20% better than can be achieved using commercially available products.



Design & Engineering

This program seeks to provide design and engineering that will lead to new or substantially improved polymer extrusion processes and end products.

Prediction of properties of processed polymers

The objective of this project is to predict the properties of a polymer after processing. Computer-aided engineering analysis used in the plastics moulding industry inputs data obtained for the material. However in moulding, various colours and other additives are typically used, which are known to affect viscosity, crystallisation behaviour, shrinkage and mechanical properties of the moulded part. There is currently no method for predicting these poorly understood effects.

Polymers for functional and isoporous membranes

The objective is to develop functional polymers and additives for manufacturing isoporous membranes with reduced fouling and high selectivity. Membrane fouling is one of the major problems in purification processes using membranes. Fouling causes a loss of membrane performance, requires time and cost intensive cleaning steps, and shortens the membrane lifetime. Research in this project is investigating several approaches to reduce membrane fouling, including the incorporation of additives selected or designed to reduce fouling, and the development of processes for making membranes with uniform pore sizes (isoporous membranes).

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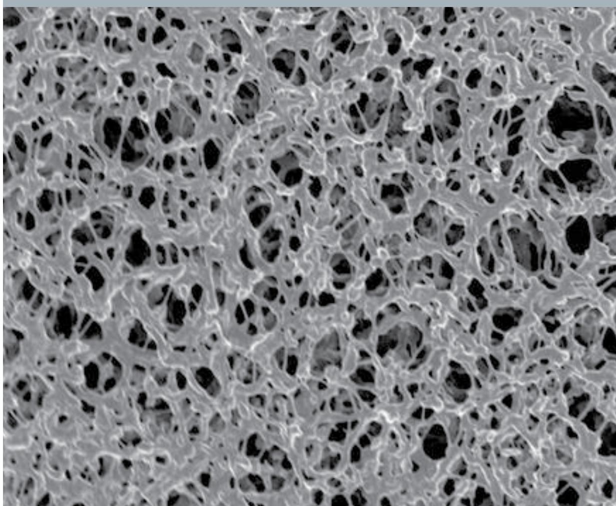

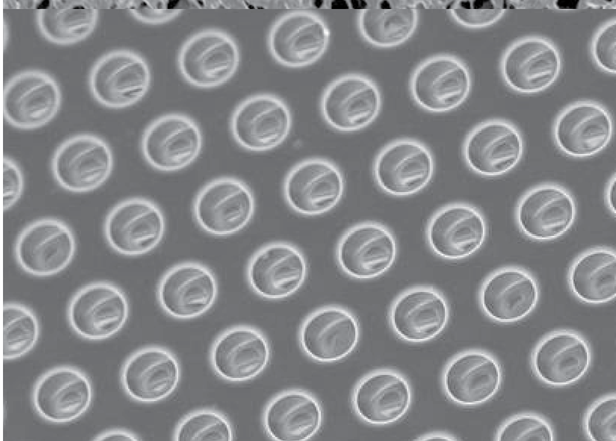

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