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Cooperative Research Centre for Polymers

CRC AUSTRALIA

Biopolymers help wound healing, medical imaging and drug delivery

Polymers have long been used in biomedical applications – for prosthetic implants, contact lenses and stents among other uses. Advances in polymer research over the past decade mean these tools are now being applied to advanced biomedical applications. Polymer scientists and cell biologists will gather in Brisbane today to share ideas about how advances in polymer technology can be applied to cell culture research to develop, among other things, large-scale expansion in stem cell technology. Highlights of the seminar include:

Consortium tackles blood supply crisis

Researchers in the Biomanufacturing Consortium within the CRC for Polymers are working on developments applied to blood-forming stem cells to produce blood cells in a synthetic environment. This technology may eventually be able to produce blood products on a large scale and reduce our dependence on blood donations.

The team has developed a 'smart surface' which incorporates biological information important for cell attachment onto surfaces. Results show that highly specific binding of these factors occurs onto polymer coatings whilst the adsorption of unwanted biomolecules is prevented. Dr Bryan Coad will discuss how this type of targeted approach to creating smart surfaces could be used for directing a diverse range of cells and their function for the solution of other health-related issues.

Towards clinical application of stem cells

Researchers at Queensland University of Technology (QUT) have achieved a major breakthrough in the race to use human embryonic stem cells for medical research.

The researchers have replaced proteins normally derived from animal or human blood, which are used to grow stem cells, with chemically synthesised proteins. The achievement overcomes one of the major obstacles to the approved use of stem cell therapies. Applying this technology, the QUT team has successfully grown embryonic stem cells through more than 20 generations without animal-derived products. Associate Professor David Leavesley will discuss the world first research.

Medical imaging for early disease detection

The use of medical imaging to detect diseases, including cardiovascular disease, cancers and Alzheimers disease will lead to earlier detection and is expected to realise significant economic and social benefits. CSIRO's Peggy Stasinos will discuss the work of CSIRO's newly formed medical imaging theme, including the development of MRI and ultrasound contrast reagents based on nanoparticle systems. Her group is also developing target specific imaging technologies which will enable improved cell specific imaging, e.g. imaging work that targets and visualises the plaques in the brain, which indicate Alzheimer's disease.

Live cell imaging

Also on the topic of medical imaging, Dr Daniel Day from Swinburne University will discuss the development of a new microstructured 'microgrid' surface that can be easily inserted into most cell culture ware for physically isolating sub-populations of cells within an imaging field of view. The isolated cells can be imaged over extended periods (greater than 20 hours) without cells migrating out of view.

New generation polymers

Adjunct Professor Richard Evans from CSIRO Molecular and Health Technologies will provide an overview of advances in polymer science of relevance to biomedical applications and discuss opportunities to manipulate biologically active or bio-molecules by the same tools that are used to make and manipulate conventional polymers.

The seminar will be held at the University of Queensland, AIBN Building 75 (Level 1, Seminar Room) from 9.30am to 4pm.

For more information contact: Dr Julie-Anne White, CRC for Polymers, ph. 0412 357891

To arrange interviews with any of the speakers contact: Robin Taylor, ph. 0419 894306; rmt@robinm.org

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