MEDIA RELEASE
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Cooperative Research Centre for Polymers

Breakthroughs in stem cell culture

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

A team led by Professor Zee Upton has replaced the proteins normally derived from animal or human blood, which are used to grow stem cells, with chemically synthesised proteins.

Another member of the team, Associate Professor David Leavesley will discuss the world first research at a seminar in Melbourne today.

The achievement overcomes one of the major obstacles to the approved use of stem cell therapies.

"Traditional culture of human embryonic stem cells requires the presence of animal or human serum-derived products in the growth media for the embryonic stem cells to survive and grow," says Prof Leavesley.

Health regulators have always held serious concerns about the possible transmission of infections to humans treated with stem cells grown in the presence of these serum-derived products but until now there have been no practical alternatives.

The QUT team has successfully grown embryonic stem cells through more than 20 generations without serum-derived products.

The combination of synthetic proteins has been patented by QUT and is being commercialised by Tissue Therapies Ltd, a company that was spun out of QUT.

The seminar 'Biopolymers for Medical Research' has been organised by the CRC for Polymers to discuss the application of polymer technologies with advances in cell culture media which could lead to large-scale expansion of stem cell technology.

Other speakers include one of the leaders of the CRC's Biomanufacturing Consortium, Associate Professor David Haylock from the Australian Stem Cell Centre, who will explain how the consortium is developing new ways of modifying tissue culture plastic surfaces for growing blood cells and other cells, including neurons.

Researchers in the consortium are producing 'smart' polymer surfaces that could be used to produce a range of cell therapeutic products. These smart surfaces are polymers with biological molecules added to create a complex plastic.

"These biological molecules have a direct effect on the stem cells that we place in the culture system. The idea is to provide a culture that mimics what these cells would see in a living tissue. It provides a completely new way of growing stem cells and has dramatic implications for being able to grow multiple stem cell types – blood stem cells, neuronal stem cells or human embryonic stem cells are all possible," says Dr Haylock.

The team has demonstrated that the approach works. The next step is to put multiple signals on these surfaces so they can perform multiple functions with the target stem cells.

Another speaker at the seminar is leader of CSIRO's Nanomaterials for Medical Delivery program, Dr John Tsanaktsidis, who will discuss the use of polymers engineered to deliver controlled dosages of drugs to specific locations in the body. This new work has enormous potential to increase the effectiveness and reduce the negative side effects of drug therapy.

The CRC for Polymers is supported under the Australian Government's Cooperative Research Centres program.

More information: David Haylock - 0439 617 657; David Leavesley - 0410 500 491; John Tsanaktsidis – 0408 807920

Dr Julie-Anne White, 0412 357891 – to arrange interviews with any of the speakers

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