ARC Centre of Excellence for Electromaterials Science

MEDIA RELEASE

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Brain Building: Using stem cells to research neural disease

Researchers are building brain tissue with living human stem cells to better understand, and ultimately to treat, neural diseases like schizophrenia.

It's called *tissue modelling*. Using stem cells to develop tissue constructs in the lab that accurately reflect actual brain tissue.

Conventionally, animal models of disease are used for research, but in an effort to produce more relevant results in the lab, ACES researchers are using the real deal. After all, brain disorders like schizophrenia are actually unique to humans.

ACES stem cell expert Associate Professor Jeremy Crook, says the big challenge for researchers is to increase the level of control they have in fabricating the complicated tissue constructs.

"The brain in mind-bogglingly complex, it's undoubtedly the most complex thing known to mankind," Crook said.

"We are using additive fabrication technologies such as 3D bio-printing to carefully control our tissue constructs from the nano, through to micro and right up to macro dimensions, deliberately organising cells within the construct to closely mimic functional brain tissue."

Crook says that, in time, the tissue constructs may even be able to be used to control and restore the function of tissues or organs rendered dysfunctional by injury, disease or even normal ageing.

"We are at a very exciting time in stem cell and regenerative medicine research and technology development," Crook said.

"With the opportunity and realisation that natural and synthetic biomaterials can be used to support and control cell and tissue engineering, I believe we can better model healthy and disease biology for understanding disease processes, drug development, and tissue replacement therapy."

ACES Director Professor Gordon Wallace says a workshop to be held at University of Wollongong's Innovation Campus on 25 November, will explore exciting prospects that exist by combining stem cell research and biomaterials science.

"It is important that we embrace the wealth of knowledge that exists in this area in Australia and that we work together to get maximum returns for the communities for whom we work," Wallace said.

Other highlights of the workshop include:

- Bioengineering insulin producing cells and tissues for treating Diabetes;
- Treating eye disease with human pluripotent stem cells;
- Tissue engineering for Orthopaedics.

Australian Government
Australian Research Council

Note for media: ACES will host a 'Stem Cells for Bionics' workshop at the University of Wollongong's Innovation Campus on Tuesday 25 November.

About the ARC Centre of Excellence for Electromaterials Science: Funded by the Australian Government, ACES comprises 11 institutions worldwide, led by the University of Wollongong in Australia. ACES research programs exist to develop function devices from 'intelligent' electro-materials, including artificial muscles, electronic textiles and plastic solar cells.

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