

# The plentiful promise of the pluripotent

The potential of using stem cells to treat injury and disease is often loudly proclaimed, with justification. But culturing stem cell lines carries risks—a fact less often mentioned.

Research in recent years has found that stem cell lines grown in a lab can acquire mutations, including those in genes responsible for tumour suppression.

This potentially devastating hazard is one of the key research targets for a group led by Associate Professor Andrew Laslett, who holds positions at the CSIRO and the Australian Regenerative Medicine Institute.

"We're looking at characterisation tools," he explains.

**"We're developing a very discrete understanding of what cells are present in a mixture of cells, and then removing those that we don't want and keeping those that we do."**

Andrew secured his PhD from Monash University in Melbourne and then undertook research stints in Hong Kong and the United States of America. On returning to Australia he held successive senior appointments at Monash's Laboratory of Embryonic Stem Cell Biology and the Centre for Reproduction and Development before setting up his own research team.

The team focusses on the complex biology of human pluripotent stem cells (hPSCs)—cells which have the capacity to self-renew while maintained outside the body, and which can become almost any other type of human cell.

As well as working on biosafety tools, Andrew and colleagues have other primary research aims.

One, recently commenced collaboration with scientists from Monash University, involves developing a new remote-controlled mini-laboratory that can grow and test stem cells in microgravity. The ultimate aim is to provide a better understanding of the health risks for astronauts.

The other concerns an all-too-common disease.

"We're developing a 'disease-in-a-dish' model of breast cancer," he explains, "and using that to screen for new drugs to treat the disease, or to study the development of breast cancer from women who are predisposed to getting it."

It is this second area that occupies the time of group member and early career researcher Dr Jacob Goodwin.

"We're working on developing better models for breast cancer," he says.

"We use stem cells derived from women who carry the BRCA1 mutation, and we are trying to generate a new protocol to differentiate these cells into mature breast epithelial cells.

"Once we have them, we can then treat them using specific drugs or look for new drugs that are effective for women who carry the mutation."

