Breakthrough in stem cell research

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In an Australian first, UNSW researchers have developed three clones of cells from existing human embryonic stem cells. The breakthrough could lead to new treatments for diabetes, Parkinson's disease and spinal cord injury.
"This cloning of cells involves a new technique, which is a very accurate way of extracting and then growing a single cell," said UNSW Senior Lecturer Dr Kuldip Sidhu, who is leading the research and is based at the Diabetes Transplant Unit (DTU) at the Prince of Wales Hospital, a major teaching hospital of UNSW. "There has only been one report of cloning of cells from human embryonic stem cells anywhere else in the world – in Israel."

By growing a human stem cell colony from a single cell, researchers are one step closer to deriving a homogenous population of cells of a particular type.

"There are about 230 different cell types in the body. All these cells are derived from three embryonic layers – one which forms the brain and spinal cord, another which forms the guts and liver and a third which forms muscles and bones," he said. "We need to establish a recipe to derive each of these from human embryonic stem cells, so they can be transplanted straight into the affected area of a patient.

"The insulin-producing cells, which are derived from the layer which also forms the gut and liver are the holy grail for diabetes researchers," said Dr Sidhu. "That's because they are destroyed in type-1 diabetes, which affects at least 100,000 people in Australia. So far there is no cure

for it.

"Human embryonic stem cell research offers a permanent answer to the problem. It gives the hope that we can produce a pure population of those cells in large numbers and transplant them into the patient."

The researchers are currently in the discovery phase, where they are trying to characterise the three clonal lines they have developed.

"It is too early to say anything about these clonal lines, but one of them is inclined towards the cells which form the guts and liver," said Dr Sidhu.

Dr Sidhu and Professor Bernie Tuch, the Director of DTU have received a grant for US$140,000 for two years from the Juvenile Diabetes Research Foundation (JDRF) in the United States to continue their work.

The research comes as the Federal government's moratorium limiting the use of excess embryos ends.

Source: University of New South Wales