

Cloning raises prospect of bespoke 'cure' for diabetes

By Sarah Knapton
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HUMAN cloning has been used to create stem cells that could cure diabetes by repairing a patient's ability to produce insulin.

For the first time, scientists have created embryonic stem cells from the genetic material of a person with Type 1 diabetes and a healthy donor.

It is hoped that when these cells are injected back into the diabetic patient they will begin to produce insulin of their own accord.

Using the cloning technique that produced Dolly the sheep in 1996 may prevent the need for daily insulin injections and effectively "cure" the disease. "We are now one step closer to being able to treat diabetic patients with their own insulin-producing cells," said Dr Dieter Egli of the New York Stem Cell Foundation, who led the research, which was published in the journal *Nature*.

Patients with Type 1 diabetes lack insulin-producing beta cells, resulting in high blood sugar levels. Because the stem cells are made using a patient's own skin cells, they would not be rejected.

It is hoped that in future the stem cell therapy could also be used for Parkinson's disease, macular degeneration, multiple sclerosis, liver diseases, and for replacing or repairing damaged bone.

"I am thrilled to say we have accomplished our goal of creating patient-specific stem cells from diabetic patients using somatic cell nuclear transfer," said Susan Solomon, a co-founder of the foundation whose son has Type 1 diabetes. "Today's results give me hope that we will one day have a cure for this disease."

The technique works by removing the nucleus from an adult oocyte, an early stage egg, and replacing it with the nucleus of a healthy infant skin cell. An electric shock starts the cells dividing until they form a "blastocyst" of a few hundred cells, which can be harvested.

Dr Rudolph Leibel, a co-author and co-director of the Naomi Berrie Diabetes Center in New York, where parts of the study were conducted, said: "The resulting technical and scientific insights bring closer the promise of cell replacement for a range of human disease."

In 2011, the researchers used nuclear transfer to make stem cells and insulin-producing beta cells from patients with Type 1 diabetes, but those stem cells had three sets of chromosomes, and therefore could not be used for new therapies.

Earlier this month, the Research Institute for Stem Cell Research at CHA Health Systems in Los Angeles and the University of Seoul reported that a team had used human cloning to create stem cells for adults for the first time in a breakthrough that could lead to organs being regrown. Stem cells had previously only been created from babies' skin.

Both breakthroughs are likely to reignite the debate about the ethics of creating human embryos for medical purposes and the possible use of the same technique to produce cloned babies - which is illegal in Britain.

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