

# Pure insulin-producing cells produced in mouse

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Singapore researchers have developed an unlimited number of pure insulin-producing cells from mouse embryonic stem cells (ESCs).

These pure insulin-producing cells, which according to electron microscopy studies, have the same sub-cellular structures as the insulin-producing cells naturally found in the pancreas, were highly effective in treating diabetes in the mouse model.

The transplants of pure insulin-producing cells reduced the blood glucose levels of diabetic mice with high blood glucose levels.

The experiments also showed that the subsequent removal of the transplanted cells from the diabetic mice restored the blood glucose to its original high level.

None of the diabetic mice involved in the transplant experiments developed teratoma, which are a type of tumour often associated with ESCs and which could complicate their use in human therapeutic treatment.

Furthermore, the pure insulin-producing cells managed to retain their insulin-production and glucose-sensing capacity over time.

The Singapore researchers' achievement provides proof of principle that this strategy could be applied to human ESCs to obtain similar pure insulin-producing cells.

These research findings were published in two separate papers in the July and August 2008 online versions of the journal *Stem Cell Research*.

Conducting the research were scientists at the Institute of Medical Biology (IMB), which is under Singapore's Agency for Science, Technology and Research (A\*STAR), and the Yong Loo Lin School of Medicine (YLLSoM ) at the National University of Singapore (NUS).

The team of researchers was co-led by Dr. Lim Sai Kiang, an IMB principal investigator and a research associate professor at the YLLSoM Department of Surgery, and Dr. Li Guodong, a research associate professor at National University Medical Institutes, YLLSoM, NUS.

Commenting about these findings, Dr. Gordon Weir, Director of the Clinical Islet Transplantation Program at Harvard Medical School, who also holds appointments at the Harvard Stem Cell Institute and Joslin Diabetes Centre, said, "The amount of careful work done by this group of researchers is impressive. We need something to put into diabetic patients to treat their condition, and these findings tell us interesting things about the development of beta cells."

The strategic approach by the group offers avenues for further research in the treatment for diabetes. Said Dr. Lim, "Our ability to isolate and then multiply insulin-producing cells from differentiating ESCs provides an unlimited supply of pure insulin-producing cells to study in unprecedented detail many aspects of these cells."

Added Dr Li, "Besides providing a tool to facilitate basic research in test tubes and animals, these insulin-producing cells may be also used to replace the isolated native pancreatic cells that are hard to obtain in a large amount, for pharmacological tests".

Source: Agency for Science, Technology and Research (A\*STAR),

Singapore

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