

## Injection-free Diabetes Care



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A University of Alberta team has developed a new step to improve the process for creating insulin-producing pancreatic cells from a patient's own stem cells, bringing the prospect of injection-free treatment closer for people with diabetes.

The researchers take stem cells from a single patient's blood and chemically wind them back in time, then forward again in a process called "directed differentiation," to eventually become insulin-producing cells.

In research published this month, the team treated pancreatic progenitor cells with an anti-tumour drug known as AKT/P70 inhibitor AT7867. They report the method produced the desired cells at a rate of 90%, compared with previous methods that produced just 60% target cells. The new cells were less likely to produce unwanted cysts and led to insulin injection-free glucose control in half the time when transplanted into mice. The team believes its efforts will soon be able to eliminate the final five to 10% of cells that do not result in pancreatic cells.

"We need a stem cell solution that provides a potentially limitless source of cells", says James Shapiro, Canada Research Chair in Transplant Surgery and Regenerative Medicine and head of the Edmonton Protocol, which has allowed 750 transplantations of donated islet cells since it was first developed 21 years ago. "We need a way to make those cells so that they can't be seen and recognised as foreign by the body's immune system".

The researchers suggest this safer and more reliable way to grow insulin-producing cells from a patient's own blood could eventually allow transplants without the need for anti-rejection drugs. Recipients of donated cells must take anti-rejection drugs for life, and the therapy is limited by the small number of donated organs available.

Shapiro says further safety and efficacy studies will need to be carried out before transplantation of stem-cell-derived islet cells is ready for human trials, but he is excited by the progress.

"What we're trying to do here is peer over the horizon and try to imagine what diabetes care is going to look like 15, 20, 30 years from now", he says. "I don't think people will be injecting insulin anymore. I don't think they'll be wearing pumps and sensors".

Source: [University of Alberta](https://www.ualberta.ca)

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