

## Rebooted pancreas cells could ease type 1 diabetes

2 October 2015



*Could insulin injections become a thing of the past?*

*(Image: Gary Milner/Getty)*

Just switch them off and on again. “Rebooting” ordinary pancreas cells so they produce insulin could potentially help people with type 1 diabetes manage their blood sugar levels without the need for daily injections. The approach is simpler and potentially safer than giving people [stem cells that have been coaxed into becoming insulin-producing cells](#).

Type 1 diabetes occurs when the pancreas doesn’t produce any insulin, which moves glucose from the bloodstream to the body’s cells to be used for energy. People with the condition currently have to inject insulin to control their blood sugar levels.

To find an alternative treatment, [Philippe Lysy](#) at the Cliniques Universitaires Saint Luc – part of the Catholic University of Louvain (UCL) – in Belgium and his colleagues turned to cells from pancreatic ducts extracted from dead donors who weren’t diabetic at the time of death. The duct cells don’t produce insulin themselves but they have a natural tendency to grow and differentiate into specific types of cells.

First, the team grew the cells in the lab and encouraged them to become insulin-producing cells by exposing them to fatty particles, which get absorbed into the cells. The fatty particles carried with them the genetic code for making MAFA, essentially a genetic “switch” that binds to DNA in the nucleus and activates insulin production.

Then the team implanted these altered cells in mice with a form of diabetes to check that they secrete insulin in a way that controls blood sugar levels. “The results are encouraging,” says Lysy.

His colleague, Elisa Corritore, reported progress at this week’s annual meeting of the [European Society for Paediatric Endocrinology](#) in Barcelona, Spain. The team is preparing to submit the results for publication.

### Off-the-shelf cells

If the work progresses well, the hope is that cells can be harvested from the pancreatic ducts of dead donors and converted in bulk into cells that make insulin. These “off-the-shelf” cells could then be transplanted into people with type 1 diabetes to compensate for their inability to make the hormone themselves.

“We would hope to put the cells in a device under the skin that isolates them from the body’s immune system, so they’re not rejected as foreign,” says Lysy. He says devices like this [are already being tested for their ability to house insulin-producing cells derived from stem cells](#).

Previous attempts to get round this problem have included [coating insulin-producing cells in a seaweed derivative prior to transplant](#) to keep them from being attacked by the recipient’s immune system.

Lysy says that because the insulin-producing cells originate from pancreatic tissue there is less risk that they will turn cancerous after the transplant. This has always been a worry with tissues produced from embryonic stem cells, as these have the capability to form tumours if any are left in their original state in the transplanted tissue.

The basic premise of the work looks solid, says Juan Dominguez-Bendala, director of stem cell development for Translational Research at the University of Miami Miller School of Medicine’s Diabetes Research Institute in Florida. “However, until a peer-reviewed manuscript is published and all the details of the work become available to the scientific community, it is difficult to judge if this advance represents a meaningful leap in the state of the art.”

Lysy expects it will take between three and five years before the technique is ready to be tested in people.

By **Andy Coghlan**