
Stem cells ? on the way to a new diabetes treatment

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[Stem cells](#)[2]

The number of people diagnosed with diabetes worldwide continues to rise – there is even talk about diabetes as being an epidemic in some countries. The importance of solving some of the problems that come with diabetes is highlighted in last week's edition of *Nature* (May 17th) which dedicated their OUTLOOK section to diabetes.

Though type II diabetes accounts for 90 percent of all cases of diabetes worldwide, finding a cure to type I remains equally important. Patients with type I do not have many ways of combating their diagnosis, whereas for type II diabetes, a healthier diet and exercise still seem to be the best way of lowering one's chance of getting the disease.

Type 1 diabetes, also referred to as juvenile-onset diabetes, occurs when the body's own immune system starts to attack and destroy the insulin-producing beta cells in the pancreas. As a result, insulin is not secreted to the blood stream, and without insulin glucose is not taken up by the cells. Instead it accumulates in the blood causing toxicity. Some of the complications of diabetes include blindness, kidney failure, heart disease, stroke, neuropathy, among which some contributes to the risk of diabetic foot ulcers that occasionally require amputation.

There is no cure to diabetes type 1, however, people are treated with insulin injections that they have to take daily for the rest of their lives. In addition, they have to monitor their glucose levels several times a day and regulate it either by taking insulin to decrease glucose levels in the blood, or eat sugary foods if the sugar levels become too low. If the blood sugar level is kept close to normal some of the complications can be avoided. If on the other hand blood sugar levels deviate from the normal range, it can be deadly.

To combat diabetes, researchers continue to investigate in more permanent treatments for diabetes to ease the lives of the patients. A limited number of whole-organ pancreas transplantations are carried out each year. One year after transplantations most of these patients don't have any symptoms of diabetes and do not have to take insulin. Nevertheless, this is not a treatment that the average diabetic patient can hope for, as the demand for pancreases far exceeds their availability.

An alternative to whole-organ transplants is the injection of pancreatic islet cells (islets isolated from organ donor pancreas). The problem with this approach is the requirement for immunosuppressant treatment to prevent rejection of the cells and this can cause a metabolic burden on the transplanted cells. Also, with this treatment the availability of islet cells does not match the demand.

Researchers have been given new hope with the arrival of human embryonic stem cells (hESCs) as these cells can be differentiated into most cells of the human body. If insulin expressing beta-cells can be generated from hESCs, these can potentially be injected into patients in a manner similar to islet cells isolated from donor pancreas, thus providing a limitless source of insulin producing cells.

 [Diabetic glomerulosclerosis \(8\) PAM.jpg](#) [3]

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