

# Encapsulation



## Imagine...

a future where a simple procedure eliminates the need for insulin for up to 24 months.

Imagine Dave. He has lived with type 1 diabetes (T1D) since he was 12 years old. Dave's been a proactive patient and has adopted new advances in T1D treatment—from the artificial pancreas to faster insulin. And thanks to a new outpatient procedure he just had, Dave is now insulin free.

During the procedure, Dave's doctor implanted a small tea bag-like "packet" under his skin using a local anesthetic. The packet, containing new beta cells derived from other cell sources, will produce insulin as Dave needs it for up to 24 months.

Occasionally, Dave will have to check his blood glucose and visit his doctor to monitor the status of his treatment, but other than that, Dave is living his life essentially T1D free. No daily blood-glucose monitoring, no carb counting, no extreme lows or highs, and no multiple daily injections of insulin. Technically, he may not be cured. But he sure feels like it.

*JDRF isn't just imagining this. We're making it happen.*

**"Dave is living his life essentially T1D free."**

An artificial pancreas system, insulin taken just once a day, vaccines that prevent T1D, implanted beta cells free from autoimmune attack, and restoration of beta cells are all part of JDRF's plan to progressively remove T1D from people's lives until it is finally gone.

But as we work to deliver these advances, one fact is inescapable: increased funding is essential. Clinical trials and development are expensive. And for these possibilities to become life-changing realities, JDRF needs your help.

Because with your support we can create a world without T1D.

**Visit [jdrf.ca](http://jdrf.ca) to learn how you can turn type one into type none.**

# Encapsulation



## Why

Encapsulated cell therapy has the potential to virtually eliminate the relentless daily management burden for those living with T1D: no need for multiple daily insulin injections or pump therapy, no more constant blood testing, and no more carb counting. People with T1D would just go about their daily lives for extended periods of time as if they didn't even have the disease.

## What

New beta cells are created and wrapped in a permeable, protective barrier which is implanted in the body. The new beta cells release insulin when needed while the barrier protects them from being destroyed by the autoimmune attack.

## How

About a decade ago there was considerable excitement in the T1D community about islet cell transplants—the transplantation of insulin-producing cells back into the body. But islet transplants have a big downside: high doses of potentially toxic immunosuppressive drugs are needed to block the same autoimmune attack that initially triggered T1D.

Encapsulation describes a therapy where a pouch composed of beta cells or islet cells, surrounded by a protective barrier, is implanted into the body. The barrier keeps the newly implanted cells alive by hiding them from the immune system, providing a safe environment where they can function normally. The cells constantly assess the amount of glucose in the blood and release exactly the correct amount of insulin. And unlike islet transplants, no immunosuppressive drugs are required.

In efforts to reach our ultimate goal of a world without T1D, JDRF has been a leader in driving encapsulation research forward. In fact, we have already supported some of the earliest human trials to evaluate select encapsulation strategies. Specifically, through our industry partnerships, JDRF is testing the ability of encapsulated pig islets to reverse severe hypoglycemic unawareness in humans. And we're helping to advance encapsulated stem cell precursors to beta cells into human testing. In the years ahead, JDRF will advance a number of encapsulation approaches to human trials as quickly as possible to determine which are the most promising, effective, and safe to deliver to people living with T1D.

Although a lot of progress has been made, we need to make this a reality. To do so, an aggressive investment in funding is still required – your contribution will make a difference. Support our efforts and together we can turn **type one into type none.**

*A small tea bag-like “packet” containing new beta cells is implanted under the skin to provide up to 24 months of natural insulin production; meaning an individual can live free of injected insulin during this time.*