

Cool Research News

A JDRF Research Update

Whether you are newly diagnosed or have been living with type 1 diabetes for a long time, JDRF is committed to lessening the burden of the disease. We hope you will enjoy reading about two exciting areas of research that have the potential to bring us closer to providing better treatments and a cure for type 1.

How to Defend a Beta Cell (Hint: Put it in a capsule!)

When you think about it...trying to live in outer space is challenging because the life-sustaining resources we need, like water and oxygen, are not available. But that didn't stop a team of scientists from making a capsule that could shield astronauts from the inhospitable environment of outer space. Now, JDRF is working on a capsule on a much smaller scale: one that could shield the insulin-producing beta cells in your body from being attacked by your immune system.

If you have type 1 diabetes, you've probably heard about these beta cells and how important they are for your health. Beta cells huddle together with each other and with a bunch of other cells inside a sac-like cluster called an islet. In type 1 diabetes, parts of the immune system target the beta cells inside an islet and destroy them. JDRF helps researchers who explore ways to barricade new islets that are transplanted in the pancreas from the immune system—think of it like putting a moat around a castle to protect it from invaders. This is called beta cell encapsulation, which aims to keep immune system attackers from getting inside these newly transplanted cells, while letting insulin out to help control your blood sugar.

It's surprising that one material that works well in this research is a substance found in—seaweed! This substance, called alginate, not only can protect

islets from the immune system, but also can keep them alive and healthy by letting in oxygen and other necessary nutrients. JDRF supports research that will help scientists understand how to make alginate work even better. The goal is to build a capsule that protects precious beta cells so that they can produce the insulin your body needs.

A Sweet Performance

Sometimes too much of a good thing can be bad. Take sugar, for instance. Sugar is important because it provides the cells in your body with the energy they need to do their jobs. But too much sugar can also damage cells. When beta cells, which are the insulin-producing cells in the body, have to constantly work to control high sugar levels in the blood, they can get stressed and burn out. However, JDRF-funded scientists in Israel have found that when beta cells sense a certain amount of sugar in the blood, this can prompt them to form valuable new beta cells. This is called beta cell “regeneration.”

The researchers in Israel studied the role of blood sugar in beta cell regeneration and discovered that the real star in this process is an enzyme called glucokinase. An enzyme is a protein with a purpose. In the case of glucokinase, its job is to sense how much sugar is in the blood and alert beta cells to secrete insulin when levels are high. In fact, researchers recently showed that when glucokinase speeds up, its actions may be able to trigger beta cells to produce new beta cells, or regenerate. Unfortunately, this doesn't mean that you should eat more sugar. What this does mean is that scientists now know that glucokinase has an important role which impacts the number of beta cells in your body, and they can use this information in developing drugs that can bring us closer to better treatments and a cure for type 1 diabetes. Pretty sweet news, indeed!

To find out more about type 1 diabetes research, or how to get involved with JDRF in your community, visit www.jdrf.org