Thanks to synthetic insulin, which is based on technology developed at City of Hope, we are transforming the treatment of type 1 diabetes symptoms. And while that is great, we know that treating symptoms alone is not enough. After all, insulin is not a cure for type 1 diabetes.

Medical textbooks are always being revised for the simple reason that clinicians and researchers are constantly learning new things.

For example, we now know that type 1 diabetes manifests at any age. We know that many patients keep a silent reserve of insulin-producing beta cells. And we know that diabetes “risk” genes have a role to play in the fight against cancer. In fact, recent studies have revealed unexpected opportunities to actually reverse disease in type 1 diabetes.
At City of Hope, diabetes has a storied history. This is the place where scientists first learned how insulin works and how to make it in a petri dish. The insulin receptor was discovered here, too. Dr. Samuel Rahbar, the “father” of HbA1c (the only marker for the control of blood sugar), was based at City of Hope.

Building upon this incredible legacy, we have set ourselves a new goal: finding a cure for type 1 diabetes.

At the Diabetes & Metabolism Research Institute at City of Hope, experts in every major area of diabetes research have gathered to work together in pursuit of this one goal. We believe that gaining a thorough understanding of genes, the immune system, islets and diabetes complications — and the relationships between them — will point the way forward.

Our program is unique in that we are seeking to engage the immune system rather than suppress it. Our goal is to teach the immune system to cherish the body’s insulin-producing cells instead of destroying them.

How do we achieve this? By taking lessons from nature, which shows us how immune cells, vitamin D3 and biopharmaceuticals all have a role to play in moving us toward a cure. We are also fortunate to be part of an internationally renowned cancer hospital like City of Hope, whose unique expertise enables us to design selective and specific immunotherapies to personalize our medicine.

Like our patients, we are in a hurry. We are on an aggressive timeline to translate our discoveries to the clinic and we know that the clock is ticking. Our work is only possible thanks to the Wanek family and the many other supporters of City of Hope, perhaps even you.
HOW ARE WE GOING TO DO IT?

1. DON’T BLAME THE IMMUNE SYSTEM

The immune system protects us from cancer and infections. Type 1 diabetes is the result of a mistake of the beta cell, not the immune system. This mistake causes the immune system to respond and kill the cell, as it would in cases of cancer and infection. Although the immune system has good intentions, it nevertheless attacks and destroys insulin-producing beta cells in the pancreatic islets. We are developing multiple immunotherapeutic strategies to correct this.

But rather than simply turn the immune system off, we want to work cooperatively with it, encouraging it to live in harmony with beta cells. One of the ways in which we are doing this is with a “reverse” vaccine, which is close to being tested in the clinic. With guidance from the Food and Drug Administration, the study protocol is near finalization.

Other new insights indicate that the immune system is legitimately responding to distressed islets. This implies that treating the immune system alone may not be sufficient to cure the disease. To fill this gap, we are bringing additional novel therapies to bear.

2. BOOST THE BETA CELLS

Beta cells are the hardest-working cells in our body, so their ability to defend themselves is limited. Building on our understanding that beta cells are actively involved in their own demise, we are developing new strategies to revitalize islets and make them resistant to inflammation.

We have developed new ways to reprogram beta cells, enabling them to go into “stealth mode” and become invisible to the immune system. At the same time, we are working to improve their health and vitality. In our islet transplant program, we will be testing the success of these new strategies as a prelude to their wider use in curing type 1 diabetes.

3. AVOID COMPLICATIONS

The ultimate goal of curing type 1 diabetes is to restore a patient’s insulin production so they don’t need to inject it daily and can stop worrying about their blood sugar. Wanek Project scientists and clinicians are halting disease progression by using immunotherapy to protect a patient’s remaining beta cells, which have themselves been enhanced with increased health and protections.

But complications are what patients fear most. These can include acute problems like blood sugar that is too low or too high, and chronic problems that affect the eyes, nerves, blood vessels, heart and kidneys. At City of Hope, we are working tirelessly to understand how these complications arise. But more than that, we are developing a promising treatment — a “pill” — to address these issues, and will soon be testing its safety and efficacy.

For more information, please visit our website, and stay tuned for opportunities to join our studies.

CityofHope.org/wanek-project