From Basic Science to Human Research

A NEW APPROACH TO TREATING TYPE 1 DIABETES

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In April 2008, Eisenhower Medical Center was privileged to host one of the country's top experts in diabetes as a speaker at the annual A Day of Hope for Diabetes® event. Denise Faustman, MD, PhD, is director of the Immunobiology Laboratory at Massachusetts General Hospital, and Associate Professor of Medicine at Harvard Medical School. Currently there is great emphasis on new treatments for Type 1 diabetes, particularly blood glucose monitoring devices, insulin pumps and islet cell transplantations. However, there is little emphasis on disease reversal or an end-all cure for this disease. Dr. Faustman has been conducting groundbreaking research on Type 1 diabetes for more than a decade, looking at the possibilities for reversing the disease, rather than just addressing its symptoms.

Dr. Faustman's lab is studying diabetes in mice, examining the behavior of their white blood cells. With Type 1 diabetes, diseasecausing white blood cells, also known as T-cells, mistakenly attack what are called insulin secreting islet cells in the pancreas, mistaking the insulin islet cells for foreign invaders. This "autoimmunity" behavior by the white blood cells eventually kills the insulin cells, which means patients must replace them by injecting insulin to control their blood sugars.

In her research, Dr. Faustman found that the disease-causing white blood cells were destroyed after they were exposed to a substance called tumor necrosis factor-alpha (TNF-alpha). This treatment not only stopped the autoimmunity reaction and restored blood glucose to normal, but also caused the actual regeneration of insulin producing cells. Several other research groups repeated Dr. Faustman's research protocol, and found similar results. The research could prove promising not just for reversing Type 1 diabetes, but also other autoimmune diseases such as rheumatoid arthritis, Sjögren's syndrome and lupus.

How do these results translate to Type 1 diabetes in human beings? Dr. Faustman and her colleague David Nathan, MD, Professor of Medicine at Harvard Medical School, are starting human trials that will apply the same principles utilized in their research on mice. Beginning this year, Dr. Faustman and Dr. Nathan will test a new drug, Bacillus-Calmette Guérin (BCG), which is known to cause a patient's own body to produce more TNF-alpha, the very substance that destroyed the bad T-cells in mice. The hope is that the drug will destroy the T-cells that cause diabetes in humans. BCG is a relatively risk-free drug that has been in existence for more than 80 years and is being used worldwide as a vaccination to prevent tuberculosis (TB) abroad. Could BCG, a drug used for many years that is both low cost and safe be the cure? Let's keep our fingers crossed.

We were fortunate to have Dr. Faustman present her research at A Day of Hope for Diabetes in 2004 and again in April 2008. To learn more about Dr. Faustman's work, go to: www.massgeneral.org/diabetes/diabeteslaboratory_programtocure.htm

Diabetes Roundtable Discussion Desert Diabetes Club W, Oct 15, 2 to 3 p.m. **'Tis the Season to Eat Right** Kris Moore, RD, CDE W, Nov 19, 2 to 3 p.m. Held at the Annenberg Center for Health Sciences at Eisenhower. Call 760-773-1578 for information.

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