

Updates

Fall 2018



MASSACHUSETTS
GENERAL HOSPITAL



HARVARD
MEDICAL SCHOOL

from the Faustman Laboratory at Massachusetts General Hospital

A Note from Dr. Faustman

This was a major year for the Immunobiology Lab here at MGH and our quest to reverse type 1 diabetes. In June, we published data on the patients in the BCG program followed for at least five years. The results showed restoration of near-normal blood sugar levels three years after receiving two doses of BCG four weeks apart—improvements that persisted. All participants in the study were adults with longstanding type 1 diabetes. In addition to the clinical success, we believe we have uncovered an additional effect BCG has on long term diabetic subjects, a novel metabolic mechanism that increases cellular consumption of glucose. The news spread quickly around the world through dozens of media stories including coverage by *CNN*, *Time*, *The*



Boston Globe, *The Telegraph* and *The Washington Post*.

Our work is not done. The Phase II clinical trial is still underway. All 150 patients have received at least two doses of BCG or placebo. We are also actively planning a pediatric trial, which, depending on funding, we hope to start as early as next year. BCG is a generic vaccine, which means the profit will be the people it helps.

This is great for patients, but it also means we need to fund the research with donations from individuals and private philanthropies.

We hope you will help us move this important work forward. Please contact us if you have any questions at diabetestrial@partners.org.

Sincerely,

Denise L. Faustman, MD, PhD

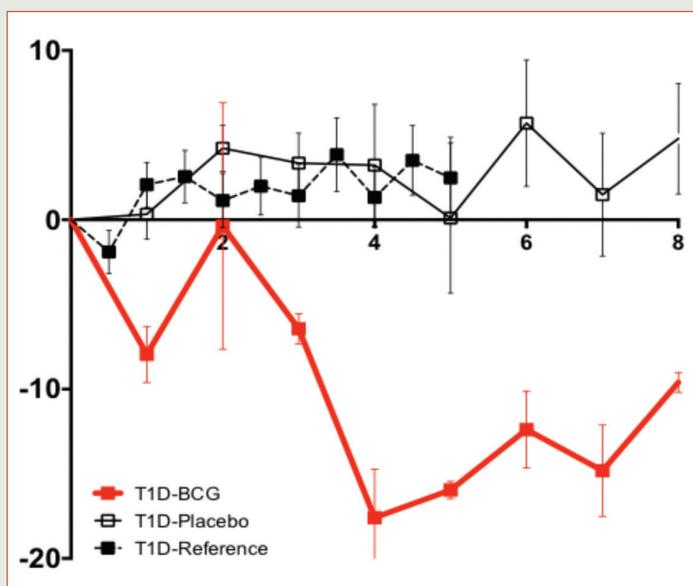
Long-term Follow Up of Phase II

On June 21st, the Faustman Lab published in *Nature Vaccine* results of participants in the bacillus Calmette-Guérin (BCG) clinical trial program who had been followed for at least five years.

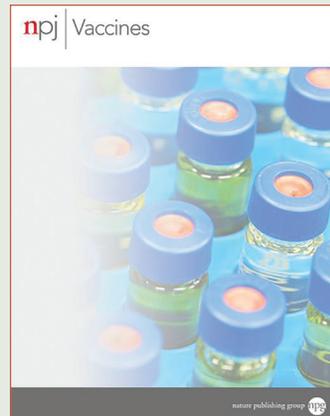
The patients had received two administrations of the BCG vaccine four weeks apart. All were adults with longstanding type 1 diabetes. All of the patients showed an improvement in HbA1c to near normal levels – improvement that persisted for the following five years.

What is the significance of HbA1c?

HbA1c refers to glycated hemoglobin and is a measure of overall average blood sugar levels over a period of months. Higher HbA1c is directly correlated with greater risks of developing diabetes-related complications such as blindness, heart attacks, strokes and renal failure. A significant lowering in HbA1c is a primary endpoint for diabetes clinical trials.



HbA1c dropped in the treated participants (red line).



Nature Vaccines

Regular monitoring of clinical trial participants found that HbA1c levels of those receiving BCG had dropped by more than 10 percent at three years after treatment and by more than 18 percent at four years. That reduction was maintained over the next four years, with treated participants having an average HbA1c of 6.65 (close to the 6.5 considered the threshold for diabetes diagnosis) and with no reports of severe hypoglycemia. Participants in the placebo group and in a comparison group of patients receiving no treatment experienced consistent HbA1c elevations over the same eight-year time period.

In investigating how BCG administration produces its beneficial effects, the research team identified a mechanism never previously seen in humans in response to treatment with a drug – a shifting of the process of glucose metabolism from oxidative phosphorylation, the most common pathway by which cells convert glucose into energy, to aerobic glycolysis, a process that involves significantly greater glucose consumption by cells. The researchers also found that BCG could reduce blood sugar elevations in mice that were caused by means other than autoimmune attack, raising the possibility that BCG vaccines could also be beneficial against type 2 diabetes.

Updates on How BCG Changes the Immune System

Over the course of the last year, Dr. Faustman presented updates on the BCG clinical trial program at three international diabetes conferences and was invited to give a key note speech at a special conference organized in Paris at the Pasteur Institute in honor of the 110th anniversary of the discovery of the BCG vaccine.

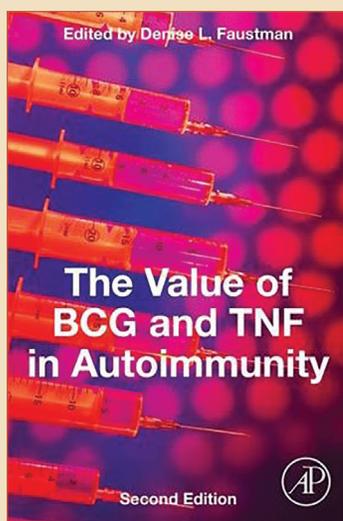


Trial Recruitment

The Phase II trial is fully enrolled, but we are still looking for patients for future study groups. We are actively planning and designing new cohort and study groups including a pediatric trial and an expanded trial in adults that we hope to start next year. If you are interested please contact the lab. We recommend you email the lab at DiabetesTrial@partners.org to see if you might be eligible for a type 1 diabetes trial or FibromyalgiaStudy@partners.org if you are interested in the fibromyalgia trials.

New Edition of Book

In September, Dr. Faustman, in collaboration with BCG researchers around the globe, published a new edition of *The Value of BCG and TNF in Autoimmunity*. The book is based on the third International BCG conference held in October 2017. The new book contains several new chapters including updates on the large pediatric prevention trials taking place in Denmark and Australia.



“The clinical effects and the proposed mechanism demonstrated are exciting and add to the emerging consensus that the BCG vaccine can have a lasting and valuable impact on the immune system. The MGH trials and other, larger prevention and intervention trials underway around the globe may lead to a major shift in the prevention and treatment of infections and autoimmunity.”

Mihai G. Netea., PhD, professor in the Department of Internal Medicine at Radboud University Medical Center in the Netherlands

FUNDRAISING EVENTS

Drive To Cure Diabetes Turns Ten

Kathy Kearney and her team put together another incredible golf tournament in New York.



Old Friends in Connecticut

On September 12th, Kim Morse hosted a meeting with donors organized by Sue Root. Sue is one of our longest standing advocates going back to a bike ride she organized with Jackie Fusco in 2004. Stephen Schwartz opened the evening.

Strike Out Diabetes

Amy Sampen and her husband, MLB veteran Bill Sampen, launched a new organization dedicated to striking out type 1 diabetes. Proceeds are going to support the lab.



The NFL Intercepts Diabetes

Mr. Sid held a special evening for the Faustman Lab hosted by former New England Patriots Scott Zolak, Jerod Mayo and Rob Ninkovich to kick off Mr. Sid's season long campaign to raise funds for type 1 diabetes research.

How You Can Help

Please consider making a tax-deductible donation to this type 1 diabetes research program. Every gift makes a difference.

1. To make a secure online donation, visit www.faustmanlab.org and click on "Donate."

2. You may make a gift by check (payable to "Massachusetts General Hospital") and mail it to:

*Diabetes Clinical Trial
c/o Dr. Denise Faustman
Immunobiology Laboratory
MGH - East
Building 149, 13th Street, CNY-3601
Charlestown, MA 02129*

On the memo line, please write: "Faustman T1D research."

Thank you for joining us in the fight against diabetes!

For more information, visit www.faustmanlab.org or email DiabetesTrial@partners.org.

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