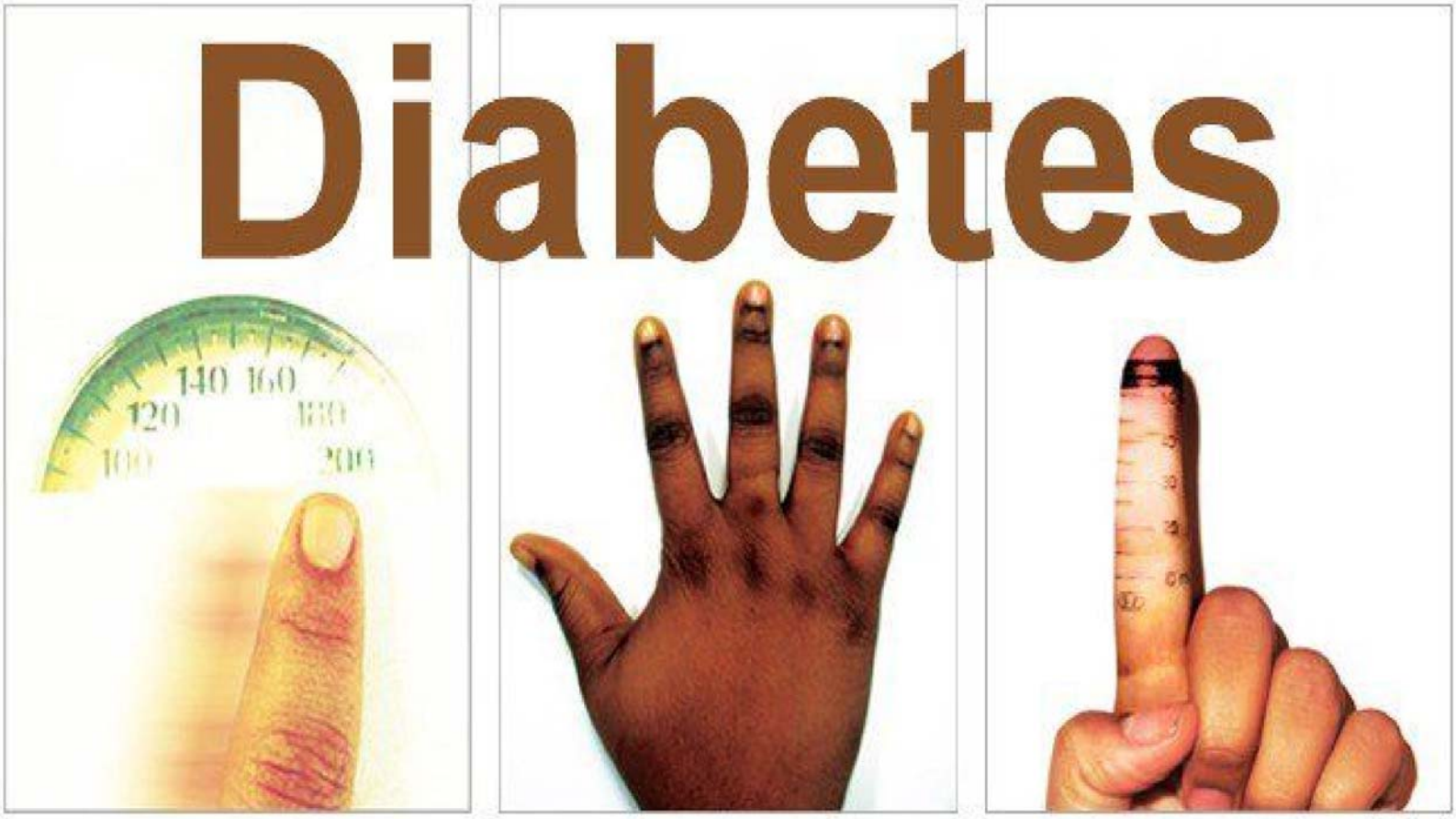
# Diabetes



**The World Health Organization** estimates that more than 220 million people worldwide have diabetes. In the U.S., it is estimated that approximately 24 million people, or just under 8% of the population, have been struck with this disease – and its incidence is increasing. Two women profiled in *Her Story: A Timeline of the Women Who Changed America* have played key roles in helping with our understanding of the underlying causes and the treatment of diabetes.

Diabetes is a disease that affects how your body processes glucose, or blood sugar. Glucose is vital to your health because it is the main source of energy for the cells that make up your muscles and tissues. If you have diabetes, you have too much glucose in your blood. One of the most frequently used treatment regimes for diabetes involves injections of insulin that help control the blood sugar.

**Gerty Cori** and **Rosalyn Yalow** did much to advance scientific knowledge of glucose and of insulin. Both women received the Nobel Prize in Physiology or Medicine for their work, Cori in 1947 and Yalow in 1977.

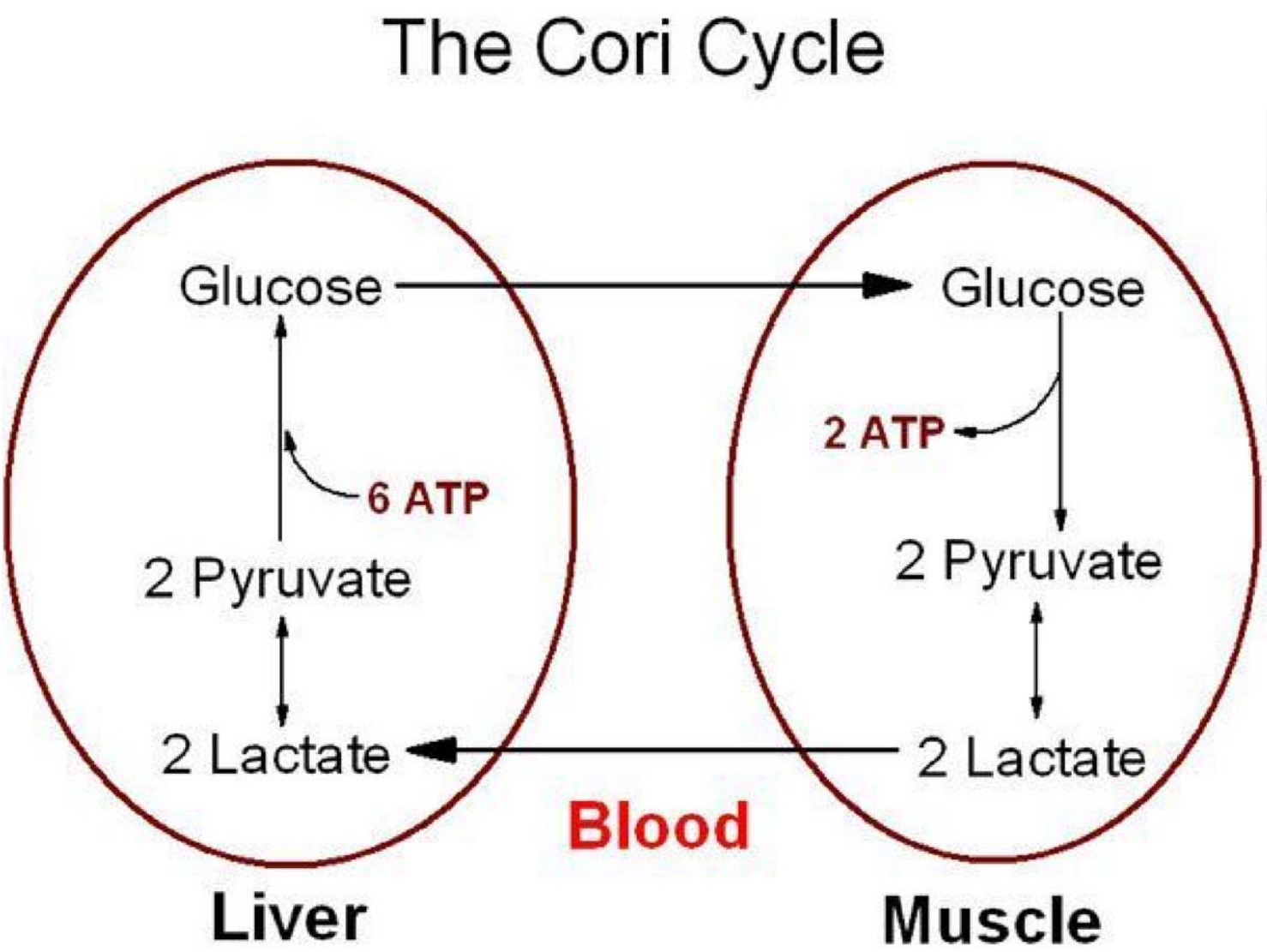
Gerty Cori was educated in Prague and received her M.D. there. After immigrating to the U.S., she and her research partner, her husband Carl Ferdinand Cori, focused on two major areas of biochemistry: sugar metabolism (how sugars supply energy to the body) and glycogen storage disorders. The Coris work was so fundamental to understanding how the body processes food into energy that it can use, that the process is named after them: the Cori cycle.

The Coris also demonstrated that water was not involved in carbohydrate

metabolism. In addition, they provided much of the scientific understanding of the carbohydrate metabolism process. Their work fundamentally changed the way that scientists thought about reactions in the human body. The Cori laboratory gained such an international reputation that no less than five Nobel Laureates spent part of their careers in the Cori's laboratory working with them on various scientific issues.

Later in her career, Gerty Cori concentrated her scientific work on the inherited, rare, childhood diseases known as glycogen storage disorders. She demonstrated that these disorders are caused by disruptions in sugar metabolism. Her work was instrumental in convincing other researchers in biomedicine that understanding the structure and roles of enzymes could be critical to the understanding of the diseases themselves. In this way, she again opened up new fields of study for other scientists. Gerty Cori was the first American woman and the third woman to receive a Nobel Prize in the sciences. Like both scientific women Nobel Laureates before her – Marie Curie and her daughter, Irene Joliot-Curie – Cori's research partner and co-recipient was her husband.

Physicists Rosalyn Yalow, the second woman we would like to highlight this month, received the Nobel Prize in Physiology or Medicine for the development of radioimmunoassay (RIA). RIA is a method of quantifying minute amounts of biological substances in the body by using radioactive-labeled material. While an employee of the Veterans Administration, Yalow collaborated for 22 years with Solomon Berson. Using radioisotopes, Yalow and Berson developed a method of




discerning the quantity of blood cleared of iodine by the thyroid gland per unit of time. This method formed the basis of understanding for their next effort. They chose insulin because it was readily available and because Yalow's husband Aaron was diabetic. Insulin lowers blood sugar; without insulin, humans will die.

Yalow and Berson's research determined that diabetics who were taking insulin became immunized such that they developed insulin-binding antibodies, which kept the insulin molecules in the bloodstream. This was the first real proof that so small a protein could stimulate a response from the immune system, and was not accepted readily by the scientific establishment. They proved that the human immune system could recognize and respond to smaller molecules than previously thought possible and they had proven it using their RIA technology. RIA was a technological breakthrough. Despite the vast commercial potential of RIA, Yalow and Berson chose not to patent it; they wanted RIA available to help other researchers make a difference in the study and treatment of diseases such as diabetes.

RIA stimulated a revolution in theoretical immunology and in all of biology. Today, it is used to screen blood for the hepatitis virus in blood banks, to determine effective dosage levels of drugs and antibiotics, to detect foreign substances in the blood, to treat dwarfed children with growth hormones, and to test and correct hormone levels

in infertile couples. Yalow received the Nobel Prize for the development of RIA in 1977. She was saddened that Berson had died of a heart attack in 1972 and thus did not share in the Nobel Prize or other prizes that Yalow received.

Both Gerty Cori and Rosalyn Yalow did much to advance both our knowledge of and the treatment for diabetes. We need many more women like them. As Yalow said, "We cannot expect that in the foreseeable future women will achieve status in academic medicine in proportion to their numbers. But if we are to start working towards that goal we must believe in ourselves or no one else will believe in us; we must match our aspirations with the guts and determination to succeed; and for those of us who have had the good fortune to move upward, we must feel a personal responsibility to serve as role models and advisors to ease the path for those who come afterwards."

Do join us as we salute Gerty Cori and Rosalyn Yalow.


**Charlotte Waisman and Jill Tietjen**

Charlotte S. Waisman

Jill S. Tietjen

**Charlotte S. Waisman, PhD,** is a national champion and advocate for women as a professor and keynote speaker. As an executive coach, Waisman coauthored 50 Activities for Developing Leaders and The Leadership Training Activity Book. She is a principal with a consulting company specializing in leadership and workforce excellence initiatives.

**Jill S. Tietjen, PE,** is an author, speaker and an electrical engineer. Her books include the Setting the Record Straight series. Tietjen is a top historian on scientific and technical women. She is President/CEO of Technically Speaking, a consulting company that specializes in improving career opportunities for women in technology.

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