



## 14.4 Rosalyn Sussman Yalow

*Rosalyn Sussman Yalow and her research partner, Solomon Berson, developed radioimmunoassay, or RIA. This important medical diagnostic tool uses radioactive isotopes to trace hormones, enzymes, and medicines that exist in such low concentrations in blood that they were previously impossible to detect using other laboratory methods.*

### Encouraged and inspired



Rosalyn Sussman was born in 1921 in New York City. Neither of her parents attended school beyond eighth grade, but they encouraged Rosalyn and her older brother to value education. In the early grades, Rosalyn enjoyed math, but in high school her chemistry teacher encouraged her interest in science.

She stayed in New York after high school, studying physics and chemistry at Hunter College. After her graduation in 1941, she took a job as a secretary at Columbia University. There were few opportunities for women to attend graduate school, and Sussman hoped that by working at Columbia, she might be able to sit in on some courses.

### A wartime opportunity

However, as the United States began drafting large numbers of men in preparation for war, universities began to accept women rather than close down. In fall 1941, Sussman arrived at the University of Illinois with a teaching assistantship in the School of Engineering, where she was the only woman.

There, she specialized in the construction and use of devices for measuring radioactive substances. By January 1945 she had earned her doctorate, with honors, in nuclear physics, and married Aaron Yalow, a fellow student.

### From medical physics to 'radioimmunoassay'

From 1946–50, Yalow taught physics at Hunter College, which had only introduced it as a major her senior year and which now admitted men. In 1947, she also began working part time at the Veterans Administration Hospital in the Bronx, which was researching medical uses of radioactive substances.

In 1950 she joined the hospital full time and began a research partnership with Solomon A. Berson, an

internist. Together they developed the basic science, instruments, and mathematical analysis necessary to use radioactive isotopes to measure tiny concentrations of biological substances and certain drugs in blood and other body fluids. They called their technique radioimmunoassay, or RIA. (Yalow also had two children by 1954.)

### RIA helps diabetes research

One early application of RIA was in diabetes research, which was especially significant to Yalow because her husband was diabetic. Diabetes is a condition in which the body is unable to regulate blood sugar levels. This is normally accomplished through the release of a hormone called insulin from the pancreas.

Using RIA, they showed that adult diabetics did not always lack insulin in their blood, and that, therefore, something must be blocking their insulin's normal action. They also studied the body's immune system response to insulin injected into the bloodstream.

### Commercial applications, not commerce

RIA's current uses include screening donated blood, determining effective doses of medicines, detecting foreign substances in the blood, testing hormone levels in infertile couples, and treating certain children with growth hormones.

Yalow and Berson changed theoretical immunology and could have made their fortunes had they chosen to patent RIA, but instead, Yalow explained, "Patents are about keeping things away from people for the purpose of making money. We wanted others to be able to use RIA." Berson died unexpectedly in 1972; Yalow had their VA research laboratory named after him, and lamented later that his death had excluded him from sharing the team's greatest recognition.

### A rare Nobel winner

Yalow was awarded the Nobel Prize in Physiology or Medicine in 1977. She was only the second woman to win in that category, for her work on radioimmunoassay of peptide hormones.



## Reading reflection

1. Rosalyn Yalow has said that Eve Curie's biography of her mother, Marie Curie, helped spark her interest in science. Compare the lives of these two scientists.
2. Describe radioimmunoassay in your own words.
3. What information about adult diabetes was discovered using RIA?
4. Find out more about the role of patents in medical research. Do you agree or disagree with Yalow's statement? Why?