Rosalyn Sussman Yalow was born on July 19, 1921, in the South Bronx area of New York City. She learned to read before she entered kindergarten, and during her later education, she became devoted first to mathematics and then to chemistry. At Hunter College, New York City, she became interested in physics. After she attended a lecture by the Italian-born physicist Enrico Fermi (1901-1954), her interest focused on nuclear physics. She was offered a teaching assistantship in physics at the University of Illinois (Champaign-Urbana), where she was the only woman on the 400-member faculty of the College of Engineering. She received her master’s degree in 1942 and her PhD degree in 1945 with a thesis entitled “Doubly Ionized K-shell Following Radioactive Decay.”

After Yalow received her degree, she returned to New York and became the only female engineer at the Federal Telecommunications Laboratory, a research laboratory for International Telephone and Telegraph (ITT). In 1946, she began teaching physics at Hunter College but became interested in medical research. She became a part-time consultant in the Radioisotope Section in the Bronx Veterans Administration Hospital in 1947. When radioisotopes such as radioactive iodine became available from the nuclear reactor in Oak Ridge, Tenn, she believed they would provide “a torch to light the way to investigative medicine.” She began working full time at the Bronx Veterans Administration Hospital in 1950, where she was a colleague of Dr Solomon Berson (1918-1972). They used radioactive iodine to study thyroid physiology. In 1952, Berson and Yalow published an important article on the clearance of iodine by the thyroid and kidney. Francis Raymond Keating, Jr, a well-known thyroid expert, wrote that this article was “the most important contribution to the problem of diagnostic tracer procedures which has yet appeared.”

Berson and Yalow next applied their methods to the distribution and degradation of insulin. They noted that labeled insulin has a slow rate of disappearance in diabetic persons and hypothesized that insulin might be bound to antibodies in the blood that developed in response to the use of beef or pork insulins. Yalow stated, “We soon appreciated that the same methods used to quantify antibody could be used reciprocally to measure antigen, in this case the circulating insulin.” Thus, the radioimmunoassay principle was formulated. Yalow’s report was initially rejected by a journal editor who did not believe that insulin could produce antibodies. The radioimmunoassay technique proved to be so sensitive that a Swedish scientist likened its power to detecting half a lump of sugar in a lake 62 miles square and 30 feet deep. Berson and Yalow subsequently used radioimmunoassay to measure parathyroid hormone, growth hormone, and corticotropin.

Yalow was the recipient of the Albert Lasker Award in 1976 and the National Medal of Science in 1988. She once said, “I have respect for people only because of the qualities they have, not because of their position.” She shared the Nobel Prize in medicine or physiology in 1977 with Drs Roger Guillemin (1924– ) and Andrew Schally (1926– ) for the discovery and development of radioimmunoassays of peptide hormones.

Yalow was honored on a stamp issued by Sierra Leone in 1995.