Eugene Goldwasser, the Alice Hogge and Arthur A. Baer professor emeritus of biochemistry and molecular biology at the University of Chicago, died Dec. 17. He was 88.

Generally regarded as the father of erythropoietin, Goldwasser led the team that succeeded in purifying sheep and human erythropoietin, a discovery that has enabled millions of dialysis and anemic patients to live longer and more productive lives.

Goldwasser was born in 1922 in Brooklyn, N.Y. He developed an interest in science in high school and won a scholarship to the University of Chicago, where he majored in biology. After the Japanese attack on Pearl Harbor, he worked as a research assistant in the university’s defense-oriented toxicity laboratory. He completed his bachelor’s degree in biochemistry in 1943.

In 1944, Goldwasser was drafted into the United States Army. He served for two years as a biochemist at Fort Detrick, Md., working on the army’s anthrax program. In 1946, he returned to Chicago as a graduate student and completed his doctorate in biochemistry in 1950. He then spent two years as a postdoctoral fellow with Herman Kalckar at the Institute for Cytophysiology in Copenhagen, Denmark.

In 1952, Goldwasser returned to Chicago as an instructor in biochemistry. He stayed there for the rest of his career, rising to professor of biochemistry and molecular biology. He retired in 1987 but remained active in his laboratory until he retired again in 2002.

Goldwasser started working on erythropoietin in 1955 when his mentor, Leon O. Jacobson, challenged him to isolate and purify the biochemical signal that regulated the growth of new red blood cells. By systematically removing various organs from rats and looking for the onset of anemia, Goldwasser was able to trace signal production to the kidneys. Reasoning that animals with anemia would produce more erythropoietin, he spent many years visiting a slaughterhouse outside Chicago, collecting blood from anemic sheep. But by 1971, he and his colleagues had only managed to purify six milligrams of a gram of erythropoietin from 125 gallons of plasma from the sheep.

Looking for a better source of the hormone, Goldwasser turned to urine and began collaborating with Takaji Miyake, a Japanese physician who had been collecting urine from people with aplastic anemia. Miyake was able to collect 2,550 liters of urine from his patients, which he concentrated and brought to Chicago on Christmas Day, 1975. Within 18 months the scientists managed to purify eight milligrams of erythropoietin and published their results in the Journal of Biological Chemistry (1).

At the urging of colleagues and the federal agencies that funded his research, Goldwasser submitted a patent disclosure form to the university. Unfortunately, the school officials did not patent his discovery, and Goldwasser never followed up. Many Midwestern companies also failed to take interest in Goldwasser’s findings, so he ended up sharing his results with a young biotech company called Applied Molecular Genetics (now Amgen). Amgen eventually became one of the world’s biggest biotech companies based on its sales of erythropoietin under names like Epogen, Procrit and Aranesp, which brought in billions of dollars a year. ☯️

Nicole Kresge (nkresge@asbmb.org) is the editor of ASBMB Today.

REFERENCE