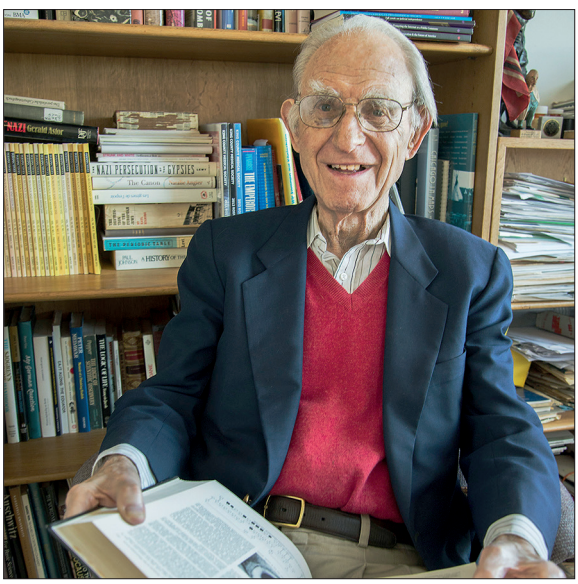

Claire McLean/UW Medicine

Arno Motulsky

Founder of medical genetics and creator of pharmacogenomics. Born on July 5, 1923, in Fischhausen, Germany, he died in Seattle, WA, USA, on Jan 17, 2018, aged 94 years.

When Arno Motulsky was discharged from the US military in 1953, after serving as a physician at the Walter Reed Army Medical Center in Washington, DC, in the Korean War, he accepted an appointment at the University of Washington in Seattle. At the time, medical genetics was a new field without a cohesive curriculum. Motulsky, who had studied haemolytic anaemias at Walter Reed, "bootlegged" some of his lectures in haematology to teach his students the rudiments of the emerging science. "I made up a syllabus based on little vignettes, case descriptions for which genetics could solve the case", he said in a 2016 interview in the *Annual Reviews of Genomics and Human Genetics*. "Word got around."

In 1956, Motulsky attended the First International Congress of Human Genetics in Copenhagen, Denmark. The next year, he founded the University of Washington's Division of Medical Genetics, one of the first such departments in the USA. While at the 1956 meeting in Denmark, he heard a presentation that sparked his interest in what would become pharmacogenomics. "I was intrigued with the interaction of enzymes, genetics, drug reactions, and disease and compiled a review of the then-known examples", he recalled in 2016. His early work in this area included studies of blood disorders such as sickle-cell disease and thalassaemia. Motulsky built the new department knowing that medical genetics touched on many different sciences: "No one can be an expert in everything, and we needed colleagues in biochemistry and statistics and later in molecular biology and genomics to carry out the research that would be useful to our patients. In order to specialize in medical genetics in those days, you had to be a little adventurous. It was exciting to inspire adventurous people further", he said. Indeed, Motulsky considered his most important contribution to the field to be his legacy of education—the mentoring of students and fellows, and the co-authoring, with Friedrich Vogel, of *Human Genetics: Problems and Approaches*, a landmark text for the specialty.

Among his many areas of interest was the genetics of hyperlipidaemia, which he encouraged a young mentee named Joseph Goldstein to study. To Motulsky's delight, Goldstein shared the 1985 Nobel Prize in Physiology or Medicine with Michael Brown for his work on the metabolism of cholesterol. That research led to the development of statin drugs. "When we become discouraged about whether identifying the gene for a trait will ever lead to a medical intervention, we should remind ourselves that this one did", Motulsky said. "It is a beautiful, cohesive story, and it took a long time—more than 20 years." Goldstein called Motulsky "a hurricane of energy, enthusiasm, exhilaration, and excitement", who "gave me the confidence, support, and resources to design and carry out a large study on lipid levels in survivors of heart attacks—at a time when I was an unknown 28-year-old". Of those 2 years, he said, "One of my fondest memories of Arno is when I would slip into his tiny book-strewn office where he would tell me about the latest interesting things on his mind. This is where I learned all sorts of stuff about science, art, and life—from the early days of medical genetics, to the latest museum shows that he had enjoyed during his world travels, to the newest books by Philip Roth and Saul Bellow."

Arriving in Chicago in the early 1940s after fleeing Nazi Germany and spending time in internment camps in Belgium and France, separated from his family, Motulsky attended night school at a YMCA. There, he met another German refugee, Gretel Stern, whom he eventually married. "I was only able to do everything I did because Gretel took care of everything else", he said. He completed his premed courses at Yale University, received his MD degree in 1947 from the University of Illinois at Chicago, and went on to residency training and a haematology fellowship at the Michael Reese Hospital in Chicago. Late in his career, Motulsky acknowledged that the field he helped create raised difficult questions. "Any discussion of population origins raises the question of whether the term 'race' is meaningful in genetics. I am uncomfortable with the term, because of the horrible misdeeds that have been done in its name." Ultimately, he said, "with respect to genetic ancestry, race is less important than a patient's genotype at any specific alleles that influence sensitivity to disease or to a drug". Motulsky is survived by a son, Harvey, and two daughters, Judy Walker and Arlene Audergon. His wife predeceased him in 2009.

Ivan Oransky, Adam Marcus