

Arthur Kornberg (1918–2007)

On October 26, 2007, Arthur Kornberg died as a result of pulmonary disease. An eventful life thus came to an abrupt end.

Arthur Kornberg was born in Brooklyn, New York, on the 3rd March, 1918 as the son of Lena Kornberg (née Katz) and Joseph Kornberg. His parents had originally lived in Galicia and had migrated to the USA in 1900. Kornberg senior worked for almost 30 years as a sewing machine operator in the Lower East Side. As his health deteriorated he opened a small hardware shop in Brooklyn in which Arthur Kornberg served customers as a small boy of just nine years.

Kornberg graduated from Abraham Lincoln High School and was awarded his bachelor's degree at the City College of New York in 1937, his master's degree at the University of Rochester in 1941, and finally his MD. Kornberg suffered from Gilbert's syndrome, which owing to an increase bilirubin level in the blood caused a mild jaundice. During his medical studies, Kornberg investigated the incidence of this mild condition amongst his fellow students. The results of this investigation formed the basis of his first scientific publication in 1942. Kornberg served his internship at the Strong Memorial Hospital in Rochester, New York, between 1941 and 1942. During the Second World War he carried out military duties as a lieutenant in the United States Coast Guard, in which he served as ship's surgeon. Even during this period the leopard could not change his spots: from 1942 to 1945 he fed rats on the ships special diets in order to discover new vitamins.

However, for Kornberg feeding rats was understandably not especially demanding; he was now increasingly interested in enzymes. After the Second World War, he started work at New York University in the laboratory

of Severo Ochoa and also attended summer courses in the areas of organic and physical chemistry at Columbia University. In addition to his everyday duties he learned the techniques of enzyme isolation. His advancement was rapid: during the period 1947 to 1953 he rose to the head of the Enzyme and Metabolism Department at the National Institutes of Health, where he immersed himself in the study of ATP production from NAD and NADP.

From 1953 to 1959 he was Director of the Department of Microbiology at Washington University in St. Louis, where he continued his experiments with DNA-synthesizing enzymes. In 1956 Kornberg isolated the first DNA polymerase from the intestinal bacterium *Escherichia coli*. In 1957 Arthur Kornberg wanted to publish his work in the *Journal of Biological Chemistry*; the manuscript was, however, rejected with the comment that Kornberg and his co-workers were insufficiently competent. Moreover, polymerase was "*a poor name*". A year later—after a new chief editor had taken over the helm of the journal—Kornberg's work was finally published. In 1959 he was awarded the Nobel Prize for Medicine together with his mentor Severo Ochoa. Further important awards were the Paul Lewis Prize in enzyme chemistry in 1951, and the US National Science Medal in 1979. He received a dozen honorary doctorates at universities in the United States as well as in Great Britain, France, Spain, and Israel.

In 1958 Arthur Kornberg founded the Institute for Biochemistry at Stanford University, which soon rose to one of the world's leading institutions in this research area. This was without doubt the great achievement of Arthur Kornberg. He understood not only how to lead the institute skillfully, but together with his colleagues also how to shape it so attractively that it always attracted the best researchers.

As Kornberg's mother died of gangrene in 1939, which was brought about through a spore infection following a routine gall bladder operation, he decided to investigate spores in depth. From 1962 to 1970, in midst of his work on DNA synthesis, he spent half his time in investigating how the DNA in spores is stored, which reproduction mecha-

nisms are present, and how spores generate new cells. Although Kornberg made advances, he finally gave up this research. Even after his retirement Kornberg ran a research laboratory in Stanford and regularly published his work. During the last 15 years his main interest lay in the investigation of polyphosphates as possible energy sources in cells.

Kornberg married Sylvie Ruth Levy, also a biochemist, on November 21, 1943. She worked closely with him and contributed decisively to the discovery of DNA polymerase. They had three sons: Roger Kornberg (Professor of Structural Biology at Stanford University and Nobel Laureate for Chemistry 2006), Thomas Kornberg (discoverer of DNA polymerases II and III and professor at the University of California), and Ken Kornberg (architect).

Arthur Kornberg was not only a brilliant scientist; he had a phenomenal ability to enthuse postgraduates and postdoctorates. His enthusiasm for good science and the continual search for new discoveries together with hard work accompanied us during our stay in Arthur Kornberg's laboratory. Arthur was always there to give advice when burning questions arose. The great expectations placed on his co-workers bore fruit: most of his several hundred postgraduates and postdoctorates were able to take up leading positions at universities and in industry.

His work ethic was exemplary, whether it was working on whole manuscripts over the weekend, or to come into the laboratory late at night to view the latest data so that the following experiment could be assessed next morning. His scientific spirit and his love of enzymes lives on in us, and his great work still influences science.

Ulrich Hübscher
Universität Zürich (Switzerland)

DOI: 10.1002/anie.200705248