

Har Gobind Khorana

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Har Gobind Khorana was a Nobel Prize winning India born American biochemist. Khorana was born in 1922 in a place called Raipur, now in East Pakistan. Although the exact date of his birth is not known, the date cited in almost all documents is 9th January. Khorana had a precocious childhood. In spite of his father not being literate, he made sure that his children received a good education. In fact, in a village of about a 100 people, Khorana and his siblings were the only literate ones.

Khorana started his schooling in D. A. V. High School, Multan and then went on to do his B. Sc and M. Sc in 1945 from the University of Punjab in Lahore. It was here that Khorana was inspired in a career of scientific research by some very good and able teachers. With a fellowship from the Government of India, Khorana left for the University of Liverpool, United Kingdom from where he received his PhD degree in 1948 under the supervision of Professor Roger J. S. Beer. It was his first introduction to western civilisation and science and Khorana soaked it, in all its glory. Following his PhD he went to the famous ETH in Zurich where he worked under the supervision of Professor Vladimir Prelog, a Nobel laureate himself.

After completing his work at ETH, he returned to India for a brief period in 1949, following which he went to the University of Cambridge and worked under Professor G. W. Kenner and Lord A. R. Todd. He stayed in the University of Cambridge until 1952, after which he moved to the University of British Columbia at Vancouver, Canada where he was offered a job. It was at British Columbia that Khorana first made a mark internationally. Although the facilities were not as good at British Columbia as what Khorana was used to in his earlier work, he had the independence to do his work in any way he wanted. There he worked independently on various research projects involving phosphate esters and nucleic acids. His work on the chemical synthesis of ribonucleotides for protein synthesis was initiated at about this time and it later proved to be fundamental for his other works. There, in 1959, Khorana discovered an inexpensive way to synthesize acetyl coenzyme A, a molecule essential to the body's biochemical processing of proteins, carbohydrates, and fats. It was a big breakthrough for this young scientist and was beacon for the good things that were to follow.

Khorana then accepted an offer from the University of Wisconsin-Madison in 1960 to serve as co-director of the University of Wisconsin-Madison Institute for Enzyme Research and a member of the Department of Biochemistry. It was there that he did his ground breaking work in interpreting the genetic code and determining the function of genes in protein synthesis for which he shared the 1968 Nobel Prize in physiology or medicine with Robert Holley and Marshall Nirenberg. Khorana detailed the functioning of the nucleotides, the chemical compounds that form the "steps" in the double helix of the DNA; mapped out the nucleotides' exact order; and demonstrated that the amino acids exist in form of triplets or codons, and each codon leads to the synthesis of a particular amino acid. He also was able to pinpoint within this structure where protein synthesis began and ended.

Khorana became the Alfred P. Sloan Professor of Biology and Chemistry at the prestigious Massachusetts

Institute of Technology in 1970, a position he retained until his retirement in 2007. At MIT since the mid 1970s he studied the biochemistry of the membrane protein bacteriorhodopsin which is responsible for conversion of photon energy into proton gradient energy and most recently studied the pigment rhodopsin which helps in vision.

Khorana was a very efficient and loyal teacher, always welcoming his students to his house and was forever eager to hear about the work that they were conducting. He was an endearing soul and a remarkable person alongside a pioneering biochemist. His name will always be written in golden letters in the annals of scientific history. Among his many remarkable discoveries, he also was the first person to artificially produce a gene inside a living organism. In his honour the Khorana Program was founded in 2007 by the University of Wisconsin-Madison, the Government of India, and the Indo-US Science and Technology Forum, with the mission to build a community of scientists, industrialists, and social entrepreneurs in the United States and India.

Har Gobind Khorana married Esther Elizabeth Sibling, a Swiss in 1952. They had three children: Julia Elizabeth, Emily Anne and Dave Roy. He left for his heavenly abode on the 9th of November 2011 at the age of 89. His research survives in the many new and wonderful findings of biochemistry and gene technology.

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