# Sanger, Fred Encyclopedia Article

## Sanger, Fred

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# Sanger, Fred

Molecular Biologist
1918-

Born August 13, 1918, in Rendcombe, Gloucestershire, United Kingdom, Fred Sanger has been breaking new ground in chemistry for decades. In fact, he is the only person to have won a Nobel Prize in chemistry twice, and is only one of four people ever to have won a Nobel Prize more than once.

While at Cambridge University in England he developed a new method for sequencing amino acids in proteins, which he used to identify the complete sequence of insulin. For this he was awarded his first Nobel Prize in chemistry in 1958. After this success, in 1961 Sanger moved to the MRC Laboratory of Molecular Biology, where he became head of the division of protein chemistry. His colleagues' interest in nucleic acids inspired him to turn his interest in sequencing to the research of nucleic acids.

In 1977 Sanger developed a sequencing method, called the "dideoxy" method, with which he determined the entire sequence of a bacterial virus called phi-X174. This was the first time a complete sequence of a DNA molecule had been established. For this achievement he was awarded the 1980 Nobel Prize in chemistry, shared jointly with Walter Gilbert of Harvard University who had concurrently developed an alternative DNA sequencing method. Sanger's original sequence contained only 5,375 nucleotides, but his technology is now being used to determine sequences that are millions of nucleotides longer, including, importantly, the human genome. In his honor one of the major DNA sequencing centers in the world is named the Wellcome Trust Sanger Institute, at the Wellcome Trust Genome Campus, Cambridge, England.

Fred Sanger shortly after receiving his second Nobel Prize for chemistry.

## See Also

Sequencing Dna.

### Bibliography

#### Internet Resource

"About Frederick Sanger." Wellcome Trust Sanger Institute. <http://www.sanger.ac.uk/Info/In tro/sanger.shtml>.