

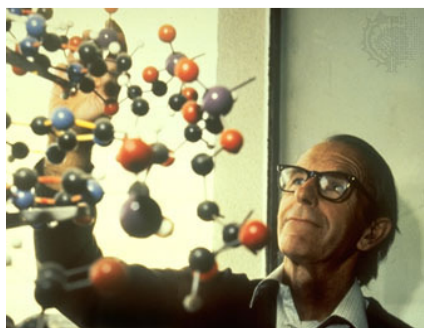
From the Editor's Desk

Adieu to a Scientific Luminary

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The passing away of Frederick Sanger on the 19th November at the age of 95 marks the end of one of the most amazing scientific odyssey of all eras. A twice Nobel Laureate, Sanger was the only living one of just four other individuals who belonged to this “elite double club” of Nobel Prize winning individuals. Although both the Nobel Prizes were won in Chemistry his scientific contributions are “milestones” which revolutionized the field of genomics and medicine. The first Nobel Prize in 1958 was for his seminal work in elucidating the primary structure of bovine insulin¹. The peptide hormone was sequenced by reacting it with fluorodinitrobenzene (FDNB) also known as “Sangers Reagent” followed by hydrolysis, electrophoresis and chromatography. It paved the way in further understanding the three dimensional structure of this highly conserved molecule, and also production of genetically engineered synthetic “human” insulin. This work served as a template for Francis Crick to formulate the theory of The Central Dogma of Biology-the flow of information within a biological system.

He won his second Nobel Prize in 1980 for developing a technique known as the “dideoxy” chain-termination method, which was used to rapidly and accurately sequence DNA molecules². The genomic DNA of bacteriophage phi X174 comprising 5386 nucleotides was the first to be sequenced by this method. His laboratory was subsequently successful in sequencing the entire human mitochondrial DNA and that of bacteriophage λ . Scientists used this technique for effectively sequencing human DNA in the Human Genome Project. In 2003 the genetic blueprint of the complete Human Genome was published. The myriad benefits of the Human Genome Project

includes basic identification and understanding of rare mutations involved in inherited diseases, diagnosis and treatment of cancer, and key advances in areas of pharmacogenomics, nutrigenomics, forensic medicine, anthropology and human evolution. To honor his inimitable leadership in the genesis and advancement of genomics, Frederick Sanger is hailed as the “Father of Genomics”. The world renowned Sanger Institute in Cambridge is also named after him.

Colleagues described him as a decisive, modest man of strong opinions who pursued his scientific goals with great zeal. Craig Venter, founder of Celera Genomics and a major contributor to the Human Genome Project described Frederick Sanger as one of the “outstanding scientists of the 20th century “. Leading from the front he was steadfast in personally doing experiments in lab till its completion. Nobel Laureate Venki Ramakrishnan described Sanger as a “superb role model “for all to emulate. Sanger is quoted as saying, “I believe that we have been doing this not primarily to achieve riches or even honor, but rather because we were interested in the work, enjoyed doing it and felt very strongly that it was worthwhile”. It summarizes his indisputable passion for work.

Winner of many awards and honors, a self-effacing Sanger turned down an offer of knighthood as he refused to be addressed as “Sir”. It was modesty-personified at the highest when he described himself as “just a chap who messed about in a lab”, and “academically not brilliant”. A genius, whose achievements ignited minds of thousands of scientists across the globe, the benefits of whose scientific work the present and coming generations, have and shall reap with gratitude. Adieu to an all time great in his last journey in life!!

References

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2. Sanger F., Nicklen S. and Coulson A.R., DNA sequencing with chain-termination inhibitors, *Proceedings of the National Academy of Sciences, USA*, **74(12)**, 5463-5467 (1977)