## Sanjay K. Biswas Memorial lecture

09:00 am, January 27, 2017
CES Seminar Hall, 3rd Floor, Biological Sciences Building
Indian Institute of Science, Bengaluru

# DNA as Information

**Prof. Vijay Chandru**
Strand Life Sciences, Bengaluru

*Abstract*

Information Theory and Information Technology have had more or less coincident timelines with the story of DNA and Genomics over the last 65 –75 years. Shannon's papers on information theory were published about half a decade before Crick-Watson's double-helix. Shannon was always cautioning scientists on the indiscriminate use of information theory in their domains and yet was unwilling to dismiss the hypothesis that "the human being acts as an ideal decoder". The code being decoded is of course the DNA sequence. However, most biologists would dismiss this hypothesis as a metaphor that when taken too literally leads to a misleading picture of development as an expression of genetic information. In this lecture, we will touch briefly on some of these philosophical controversies but focus more on the constructive or engineering aspects of this metaphor that has brought the most advanced ideas in computing to bear on the sequencing and annotation of the human genome. Today we are at the threshold of a new age of precision and personalized medicine that is affordable and accessible to increasingly larger segments of society.

*About the Speaker*

Professor Vijay Chandru (PhD from MIT, 1982) taught and conducted research in the computational mathematics of optimization, geometry, logic and biology at Purdue University (1982-1993) and the Indian Institute of Science (1992-2005). A Fellow of the Indian Academy of Sciences, he is the current president of the Operations Research Society of India for a two-year term 2017-2018.

Professor Chandru is a founder of Strand Life Sciences (www.strandls.com), a computational biology company, and of the Association of Biotech-led Enterprises (ABLE) and continues to serve in these in executive and advisory capacities. He was named a Technology Pioneer of the World Economic Forum in 2007 and the Biospectrum Biotech Entrepreneur of 2007. For contributions to Science and Society, Professor Chandru was awarded the Hari Om Trust Award by University Grants Commission (MHRD) in 2003, the President's Medal of INFORMS (Institute for Operations Research and Management Studies) in 2006, and was named in the 50 pioneers of change by India Today in 2008.

He is an Adjunct Faculty in BSSE and a Visiting Professor in RBCCPS at IISc.

# Sanjay Kumar Biswas
## (1945-2013)

Sanjay Kumar Biswas, a distinguished tribologist and educator, was on the faculty of mechanical engineering at the Indian Institute of Science since 1976. He made significant contributions in many aspects of tribology including contact mechanics, surface roughness measurement, single-point abrasion tests, nano-indentation, nano-tribology, and cutting fluids. His untiring efforts led to the development of indigenously built tribological instruments. He had extensive collaborations with the industry and world leaders in his area.

In addition to being an able researcher throughout his career, he also proved to be an effective administrator. He knew how to enthuse people around him and take up new initiatives. Undergraduate programme in IISc, IIScPress, and Bioengineering Programme in IISc are few of his many initiatives. He occupied a prestigious Department of Biotechnology Chair to work at the Translational health Sciences and technology Institute, Gurgaon, at the time of his untimely death. It was his dream to set up a National Biodesign Alliance and bring clinicians, researchers, and industry people to work towards improving the healthcare system in India.

Sanjay Biswas was a man of many interests. He ran a journal entitled Bulletin of Sciences for many years to popularize science. He was engaged in social activities to help the poor and deprived sections of the society. He was fond of music, trekking, and good food. He wrote about South Indian Temple Architecture and enjoyed history and literature. His eternal optimism and unbridled enthusiasm for everything he did are remembered by all who interacted with him.