

Sequencing Nucleic Acids: From Chemistry to Life Sciences and Medicine

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The sequence, structure, chemistry and function of nucleic acids are fundamental to our understanding of life. In this lecture I will describe the invention of a method to accurately determine the sequence of DNA at high speed and low cost on a genome scale. The approach, originally called Solexa (now Illumina) sequencing, has brought about a quantum leap in our ability to study biology and is poised to potentially revolutionise the future of medicine. I will discuss, with examples from my laboratory, how the methodology has provided new insights into four-stranded DNA structures (G-quadruplexes), the targeting of DNA with drugs and epigenetic chemical modification of the human genome. I will also discuss examples of how routine human genome sequencing will shape the future of molecular medicine.

References:

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