

2013

Next Generation Sequencing

Translation to Clinical Diagnostics

Editors:

- [Lee-Jun C. Wong](#)

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Chapter 1 History of DNA Sequencing Technologies

Lee D. White

Abstract DNA sequencing technologies have a relatively short history - with the first published report in 1977, a mere 39 years. But what a history! In 1973, Walter Gilbert and Allan Maxam published the 24-hour paper segment of the first operation using chemical sequencing techniques Gilbert and Maxam's *Proc Natl Acad Sci USA* 70:3213-1984, 1973). Through innovation and automation, we are now able to sequence the entire human genome (which takes just over a year) in a matter of a few weeks. This chapter will review this short but amazing story of basic force, innovation, and automation from its infancy to the present. Further to its story, the advances and technological leaps are continuing apace and this chapter will be updated by the time you are reading it.

1 The Early Days of Sequencing

The 1953 landmark publication suggesting the structure of DNA by Watson and Crick (1) began what has become one of the most successful modern endeavors carried out by humans. The Nobel Prize in Physiology or Medicine 1962 was awarded jointly to Francis Harry Compton Crick, James Watson, and Maurice Hugh Frederick Wilkins "for their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material". After the 1962 Nobel recognition for the discovery of the structure of DNA, it was only a short 15 years later that the Nobel Prize in Chemistry 1980 was divided, one half awarded to Paul Berg "for his fundamental studies of the biochemistry of

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