Next Generation Sequencing

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Next-generation sequencing (NGS) is an innovative technique for **low-cost, high-speed sequencing of genomes with increased efficacy.** NGS is used in various **applications such as exploration of biomarkers, oncology trials, precision medicine, agriculture & animal testing**, and so on. The global next generation sequencing market size was valued at USD 4,533 Million in 2018 and is estimated to reach USD 18,565 Million by 2026, growing at a CAGR of 19.2% from 2019 to 2026.

Next Generation Sequencing

Next generation sequencing (NGS), massively parallel or deep sequencing are related terms that describe a DNA sequencing technology which has revolutionised genomic research. Using NGS an entire human genome can be sequenced within a single day. In contrast, the **previous Sanger sequencing technology, used to decipher the human genome, required over a decade to deliver the final draft.** Although in genome research NGS has mostly superseded conventional Sanger sequencing, it has not yet translated into routine clinical practice.

There are a number of different NGS platforms using different sequencing technologies, however all **NGS platforms perform sequencing of millions of small fragments of DNA in parallel. Bioinformatics analyses are used to piece together these fragments by mapping the individual reads to the human reference genome.** Each of the three billion bases in the human genome is sequenced multiple times, providing high depth to deliver accurate data and an insight into unexpected DNA variation. NGS can be used to sequence entire genomes or constrained to specific areas of interest, including all 22,000 coding genes (a whole exome) or small numbers of individual genes.

NGS has **simplified the study of nucleotides** and has effectively replaced traditional genomics methods. This factor is expected to increase the next generation sequencing market size. Moreover, the **emergence of genome mapping systems is also expected to fuel the global market’s growth for next-generation sequencing.** One of the key developments boosting the demand is the **miniaturization of third-generation devices with the launch of palm-sized sequencers.** The continued advancement of next-generation sequencing technology’s performance and the cost is projected to fuel the growth of non-conventional applications such as agri-genomics and infectious disease research.