Title: Nanotechnology for a Genomic Revolution

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Abstract

Over the duration of the human genome project (HGP) from 1990 to 2003, more than $2.7 billion dollars was spent across 20 global institutions resulting in the cataloging of a human genome at 8 -9 X coverage. This was a monumental achievement completed through the use of hierarchical shotgun method, which set the foundation upon which modern methods of genetic analysis stand. Since the completion of the HGP, numerous efforts have been put forth to increase the accuracy, simplify the process reduce the amount of time and cost associated with measuring the sequence of any organism. This is now the foundation of modern medicine and is on the verge of a changing the way not only healthcare is performed but also revolutionizing agriculture, forensics and pharmaceutical development around the world. Over the years of 2009 through 2014, myself and a team of research scientists at illumina developed a method to sequence a human genome in less than 48 hours at a coverage of 30X and at the cost of $1000. During this talk, I will give an overview of the technologies developed to make this happen as well as set the stage for the next iteration of innovations paving the path to the $100 genome, being enabled by the NovaSeq platform commercialized by illumina this year.