The DNA Sequencing Revolution As An Important Singularity

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The cost for sequencing a single human genome using Sanger sequencing was over 200 million dollars. New sequencing technologies based upon massively parallel sequencing (so called Next Generation Sequencing) has completely transformed sequencing and now a human genome can be sequenced for under $1,000. I will review the different technologies of next generation sequencing to describe how this was accomplished. The most exciting aspect of this sequencing revolution is that now you can determine the sequence of many billions of DNA molecules simultaneously and this makes it possible to use these technologies for both basic research and in the clinic. I will describe some of the uses of next generation sequencing and their strengths and weaknesses. Finally I will discuss the next generation of these technologies that will make it possible to generate the complete sequence for an individual for less than $100. This is an important singularity that will completely transform all aspects of our lives from health and well-being to clinical treatment for disease.