Using Genomics and Genetics to Understand Human Health and Disease

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Technologies for collecting very large amounts of genomic and genetic data have dramatically increased in throughput and efficiency in recent years, so that it is now possible to determine whole and partial genome sequences and measure quantities and qualities of every type and source of nucleic acid that is produced by cells, tissues and organisms. This talk will describe the development of some of these approaches, and how they are applied on a large scale to study a variety of problems in human health and disease. Results of applying whole genome and targeted DNA sequencing to large numbers of research and clinical samples for childhood and adult diseases, acquired cancers, and interactions of our bodies and cells to the environment, including differential responses to drug treatments, will be discussed.