## Evolution in Cancer

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Cells in tumors evolve by natural selection. They are genetically unstable, acquiring somatic mutations. Some of those mutations increase the fitness of the cancer cells within the body. Unfortunately, little of the theory of evolution has been adapted to the peculiarities of natural selection and mutations in tumors. However, this is a critical area of research because that evolution drives both the process of developing cancer and the emergence of tumors that are resistant to our therapies. In fact, the evolution of cancer explains why we have not been able to cure cancer, despite massive resources devoted to the problem. I will discuss some of the differences between evolution in cancer and evolution in populations of organisms that generate challenges for the application of evolutionary theory to this new realm of inquiry. I will also touch on a few of our evolutionary results on natural selection and genetic diversity in tumors.