The innate and adaptive immune systems are tasked with protecting us from a diversity of threats ranging from injury to pathogens. Together they represent one of the most complex parts of human physiology. While immunologists have made enormous progress in identifying the components and their individual interactions, we are only beginning to understand immunity from a systems perspective. This talk will introduce the general topic of systems immunology and provide examples of how high-throughput measurements and machine learning are leading to a broader understanding of immunity. I will then discuss some of our own work in this area, focusing on modeling changes in adaptive immunity to cancer. Finally, a survey of new companies and technologies that are leveraging this understanding will be provided.