A statistical framework to investigate molecular mechanisms associated with tumor microenvironment

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Abstract: During the last decade, there have been tremendous achievements in cancer immunotherapy. Among those, immune checkpoint blockades, such as Anti-PD1, have completely changed the therapeutic approaches for many type of cancer. However, a significant heterogeneity in the efficacy of these immune checkpoint blockades has been reported and the molecular basis related to such differences have not been thoroughly investigated yet. Compositional data analysis recently received significant attention with the emergence of big compositional data such as microbiome and immune cell composition data. In this presentation, I will discuss our recent work on a Bayesian regression framework for the compositional data. This approach allows us to consider correlation among compositional outcomes, identify key covariates associated with the compositional outcomes, and utilize various prior biological knowledge. We applied the proposed statistical method to the immune-genomic data of the Immune Landscape of Cancer.