



Regression and graphical model learning for compositional data - with applications to microbiome data

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I will review our recent efforts in sparse inference for compositional data analysis with applications in microbiome data analysis. Microbiome data are typically compositional in nature, i.e. only p -dimensional proportions (or relative abundances) of microbes are available. I will show how to do sparse and robust linear regression when the compositions are used as predictors using various forms of log-contrast models. Similar techniques are available for graphical model inference where the goal is to learn microbe-microbe associations in the $p > n$ setting. I will show several data analysis tasks for real-world microbiome data, including gut, lung, and skin microbiome data. The talk is intended to give an overview over the field and is self-contained. I will also highlight open statistical questions that may be of general interest.