# On Multivariate Nonparametric Additive Models with Applications to Anticancer Drug Studies

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We have witnessed significant advances in our understanding of genomic profiles of cancer over recent years, which are driven by advances in high-throughput technologies. In particular, next generation of DNA sequencing has generated high-dimensional data automatically with unprecedented pace. This has help us find the genomic changes that occur in many cancer subtypes. A complete description of cancer related DNA variants will provide profound insights into the origins, evolution and progression of cancer and will act as an impetus for the development of new anticancer drugs. To exploit this development, studies of link patterns between the cancer genomic data and functional readouts such as drug sensitivity become fundamentally important. A number of studies have demonstrated that pharmacogenomic profiling in cancer cell lines can be used as a biomarker discovery platform to guide the development of new cancer therapies.

In this project, we will develop novel multivariate nonparametric additive models for describing the nonlinear link patterns between cancer genomic data and sensitivity data of multiple drugs. We will develop methodologies for model estimation and nonparametric testing. The proposed applications aim to improve our understanding of aspects of key cancer-related molecular mechanisms.

**References**

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