



UNC
GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH

BIostatISTICS SEMINAR



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Integrative Modeling Paradigms for Precision Oncology

Modern biomedicine has generated unprecedented amounts of data. A combination of clinical, environmental and public health information, proliferation of associated genomic information, and increasingly complex digital information have created unique challenges in assimilating, organizing, analyzing and interpreting such structured as well as unstructured data. Each of these distinct data types provides a different, partly independent and complementary, high-resolution view of various biological processes underlying a disease. In cancer, statistical modeling and inference in such studies is challenging, not only due to high dimensionality, but also due to presence of structured dependencies (e.g. pathway/regulatory mechanisms, serial and spatial correlations, tumor heterogeneity). Integrative analyses of these multi-domain data combined with patients' clinical outcomes can help us understand the complex biological processes that characterize a disease, as well as how these processes relate to the eventual progression and development of cancer. This talk will cover flexible modeling and computational frameworks that acknowledge and exploit these inherent complex structural and mechanistic relationships through hierarchical Bayesian and network-based approaches -- for both biomarker discovery and clinical prediction. The approaches will be illustrated using several case examples in oncology integrating high-throughput pan-omic (e.g. genomic, epigenomic, transcriptomic, proteomic) as well as high-resolution neuro- and radiologic-imaging data.

Thursday, April 6, 2017

3:30 pm - 4:30 pm

Blue Cross Blue Shield Auditorium