



## CPH Seminar in Precision Medicine

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### **“Data Integration for Machine Learning in Medicine Case Studies in Lung Cancer”**

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Data integration and machine learning (ML) are playing increasingly important roles in biomedical research. In this talk, I will present several studies that were designed to identify and validate clinically useful markers for prognosis and response to treatments in lung cancer patients, as a demonstration of how to use data integration and ML to facilitate biomedical research. In the first study, we used a systems biology approach to identify an 18-hub-gene signature that can robustly predict the prognosis of patients with early stage adenocarcinoma of the lung. Next, we integrated the hub genes with other types of data to derive a 12-gene set that is predictive for survival benefit with ACT with these datasets. Furthermore, we developed a clinical-grade assay for formalin-fixed paraffin-embedded (FFPE) samples and validated this predictive marker prospectively. In the second study, we developed methods to extract features from pathological images and used these features to predict lung cancer outcomes. I will also present our data integration infrastructure.

Friday, September 14, 2018 12p – 1p. UCT1414

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