My research interests are focused on developing novel methods for detecting, monitoring, and treating hematologic malignancies, particularly non-Hodgkin lymphomas (NHLs). I aim to create tools to rapidly detect and quantify tumors and their response to chemotherapy and immunotherapy, thereby enabling personalized therapies. Toward this end, I utilize tools from a wide range of disciplines, including bioengineering, computational biology, and medical oncology. I previously implemented high-throughput sequencing of the immunoglobulin genes from plasma cell-free DNA for detection of diffuse large B cell and follicular lymphomas (DLBCL and FL), the two most common types of lymphoma. This work demonstrated the superior efficacy of this assay from cell-free DNA as compared to circulating white blood cells, and has led to its translation to the clinic. Recently, I have implemented targeted next-generation sequencing for ultra-sensitive detection of circulating tumor DNA utilizing Cancer Personalized Profiling by Deep Sequencing, or CAPP-Seq, for use in NHLs. This work has led to a number of important applications in the field, including early detection of disease relapse, non-invasive genotyping of tumors, and detection of transformation of follicular lymphoma into DLBCL.
CURRENT RESEARCH AND SCHOLARLY INTERESTS

Implementation of noninvasive detection of malignancies in the clinic remains difficult due to both technical and clinical challenges. These include necessary improvements in sensitivity and specificity of biomarkers, as well as demonstration of clinical utility of these assays. My research focuses on technical development and implementation of assays to detect and track cancers in order to facilitate personalized disease management. This includes development of methods to detect non-Hodgkin lymphoma through circulating tumor DNA (ctDNA), as well as defining the clinical utility of this assay. My current research is focused on utilizing ctDNA to answer clinically relevant questions, enabling personalized treatment paradigms.

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