**Erik Bao, MD**
**Dana-Farber Cancer Institute**

**Abstract/Bio:**

Individuals with inherited mutations in BRCA1 and BRCA2 face an estimated 70% lifetime risk of breast cancer. While BRCA1 and BRCA2 have well-established roles in DNA damage repair, the ways in which these alterations promote tumor formation remain poorly understood. This knowledge gap has limited efforts towards the detection, prevention, and interception of cancer in individuals harboring high-risk genetic variants.

The overarching goal of Dr. Bao's research project is to define the molecular changes in BRCA1/2 carriers that drive accelerated tumor formation. To test this, he is working with a cooperative group that has assembled a comprehensive single-cell atlas of breast tissue from individuals harboring inherited mutations in BRCA1 and BRCA2 as well as non-carrier individuals. Leveraging hundreds of thousands of cells profiled in this dataset, Dr. Bao will perform integrative genomics analyses to identify changes in gene expression and DNA accessibility priming BRCA1/2-mutant breast epithelial cells for tumor initiation. In parallel, he will also investigate the role of DNA copy number alterations within epithelial cells as a key driver of tumor formation within BRCA1/2 carriers. Collectively, these findings will advance our understanding of the earliest molecular alterations in precursor breast cancer cells, a key step towards enabling future strategies to target and eliminate these cells prior to malignant Transformation.

Dr. Bao received his undergraduate degree from Duke University and his medical degree from the Harvard-MIT Program in Health Sciences and Technology. He completed his internal medicine residency at the University of California San Francisco in 2024. He is currently a senior medical oncology fellow in the Breast Oncology Program at Dana-Farber Cancer Institute. Working in the laboratories of Drs. Joan Brugge and Eliezer Van Allen, Dr. Bao's research leverages computational genomics to better understand the molecular evolution of breast cancer and ultimately how these processes can be translated into new ways to prevent and treat the disease.