

MULTIMODAL COMPUTATIONAL PATHOLOGY

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Advances in digital pathology and artificial intelligence have presented the potential to build assistive tools for objective diagnosis, prognosis and therapeutic-response and resistance prediction. In this talk we will discuss our work on: 1) Data-efficient methods for weakly-supervised whole slide classification with examples in cancer diagnosis and subtyping (Nature BME, 2021), and allograft rejection (Nature Medicine, 2022) 2) Harnessing weakly-supervised, fast and data-efficient WSI classification for identifying origins for cancers of unknown primary (Nature, 2021). 3) Discovering integrative histology-genomic prognostic markers via interpretable multimodal deep learning (Cancer Cell, 2022; IEEE TMI, 2020; ICCV, 2021). 4) Self-supervised deep learning for pathology (CVPR, 2022; Nature BME, 2022). 5) Deploying weakly supervised models in low resource settings without slide scanners, network connections, computational resources, and expensive microscopes. 6) Bias and fairness in computational pathology algorithms (Nature BME, 2023).