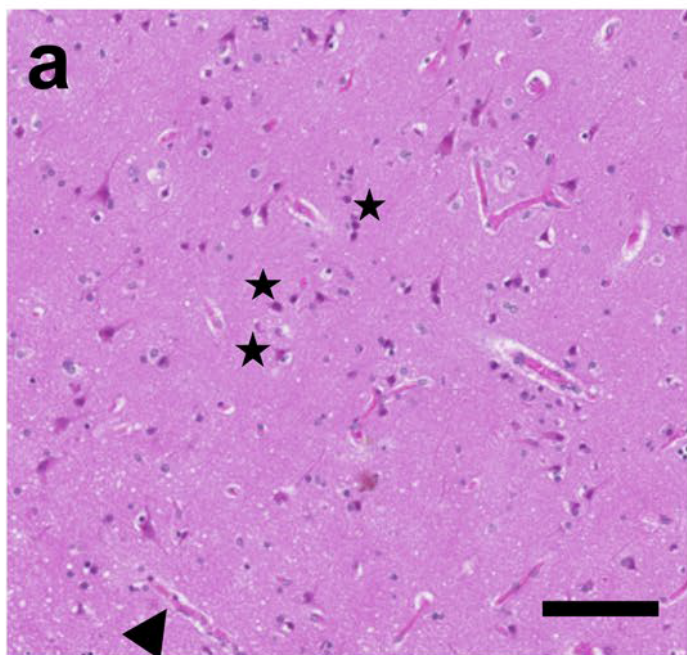
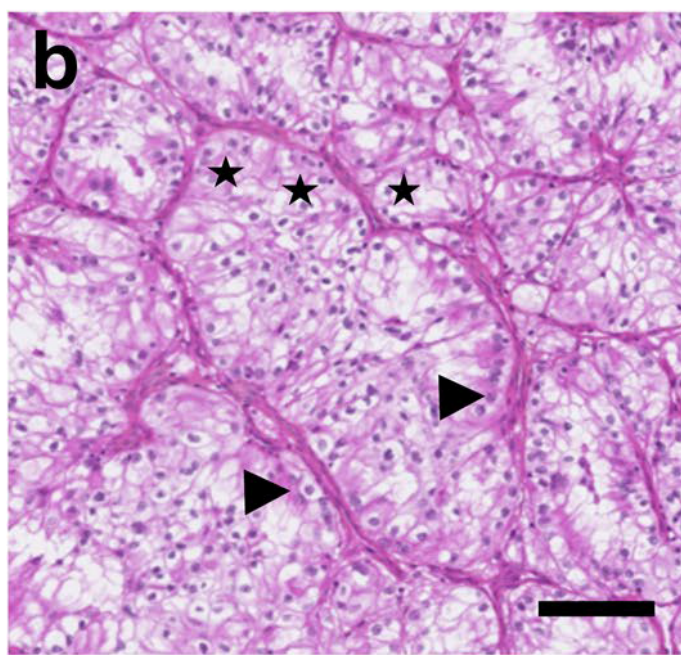


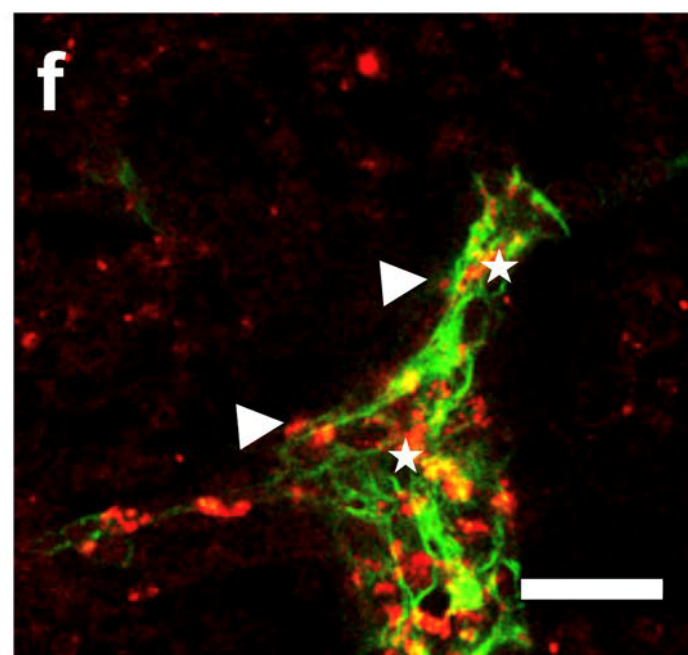
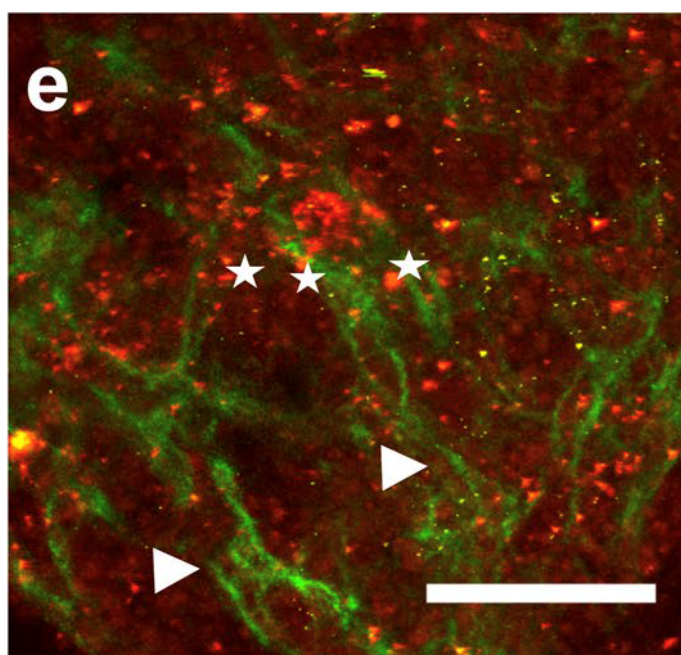
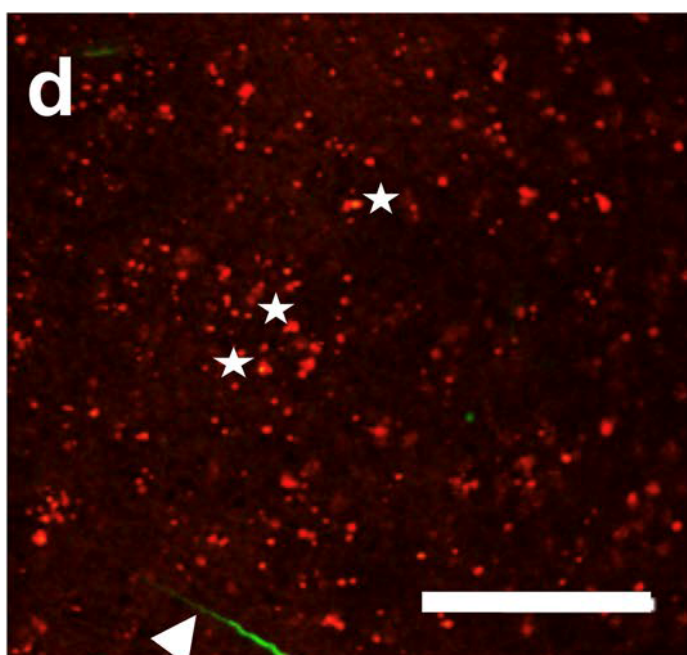
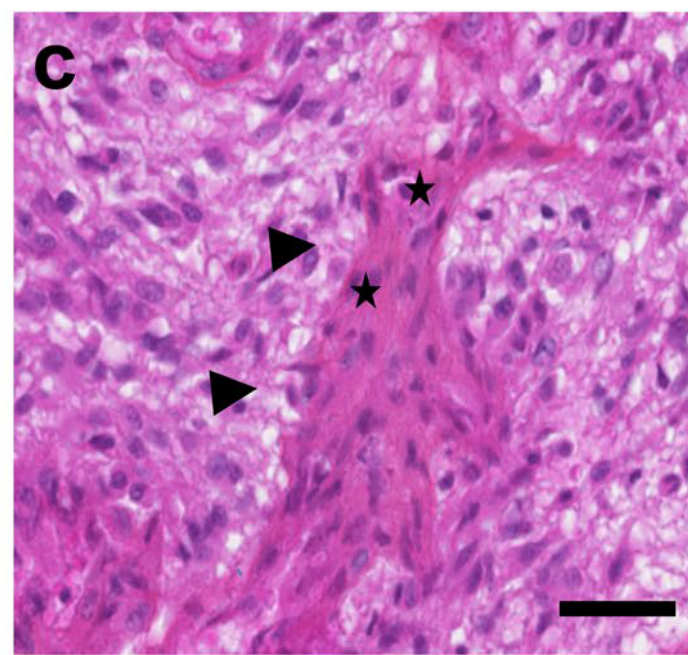
CONTROL



METASTASIS



GBM



BME PARIS
BioMedical Engineering
MASTER'S PROGRAM

Optical Guidance in Neurosurgery

Open Your Mind Seminar

Friday, Dec 06 2024
1.30 pm – 3.00 pm

Amphitheater FOURNEL
Arts et Métiers Institute of Technology
155 boulevard de l'Hôpital, 75013 Paris

The standard of care in managing brain tumors primarily focuses on achieving maximal safe resection while preserving critical brain regions. To date, this has been accomplished using neuronavigation guided by anatomical and functional imaging. However, these imaging modalities can only assist the surgeon in accurately highlighting the bulk of the tumor and, in some cases, identifying solid tumors that have infiltrated adjacent areas within the surgical field. Diffuse tumors, however, remain difficult to detect and are a leading cause of recurrence.

The current diagnostic gold standard for distinguishing between normal and diseased tissue with sparse tumor cells is histopathological analysis of biopsied samples. This is a time-consuming process, prone to sampling errors, and unable to provide real-time diagnosis. Replacing conventional pathological examination with a slide-free, label-free technique capable of delivering accurate intraoperative diagnosis in real time would significantly improve patient outcomes.

To address this critical need, we have developed a non-invasive, multimodal nonlinear endomicroscope that enables real-time optical biopsy. This instrument provides immediate diagnostic information without the need for tissue removal and assists the surgeon in optimizing the resection strategy. It integrates several contrast mechanisms to enhance detection. In parallel with the development of this tool, we are advancing our understanding of the various optical properties measured by multimodal imaging in relation to different biomolecules. This research will enable the creation of a database of optical signatures for both diseased and healthy brain tissues.

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