



3D molecular architecture and protein structure within brain tissue by fluorescence-guided cryo-electron tomography

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Room 103/107, Faculty of Medicine Bldg. A

A defining pathological feature of most neurodegenerative diseases is the assembly of proteins into amyloid that form disease-specific structures. I will present how using cryo-fluorescence microscopy (cryoFM)-targeted cryo-sectioning, cryo-focused ion beam scanning electron microscopy (cryoFIB-SEM) liftout and cryo-electron tomography (cryoET), we determined in-tissue molecular architectures in fresh mouse model and post-mortem human brain. Tomographic maps showed the architecture of β -amyloid and tau pathology. Subtomogram averaging of a microscopic region of pathology revealed the structure of a cluster of tau filaments from a single tomogram. These in situ structural approaches may be applied to address a broad range of neuroscience questions and I will also present how we are using these technologies to investigate the molecular architecture of mouse brain synapses.

Host: Yasunori Hayashi x84393