System Pathology for Neurological Disorders

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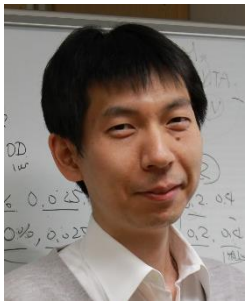

Facile 3D visualization of human brain tissue with single-cell resolution would provide a novel concept of the neuropathological diagnosis and contribute our understanding of pathological mechanisms based on comprehensive and quantitative analysis of individual biomarker. In this laboratory, we aim at establishing a novel 3D neuropathology by developing a highly efficient clearing protocol for human brain tissue and combining with a rapid 3D imaging using light-sheet fluorescence microscopy.

Research interests

1. 3D Neuropathology based on tissue clearing technique.
2. Comprehensive 3D imaging of rodent tissue samples to facilitate our understanding of stochastic disease and multi-organ network.

Materials and methods for collaborations

1. Tissue clearing technique for rodent and primate tissue samples.
2. Functional brain mapping of mouse brain samples.

Links to additional info

1. Inoue M, et al. Rapid chemical clearing of white matter in the post-mortem human brain by 1,2-hexanediol delipidation. Bioorg Med Chem Lett. 2019, 29(15):1886-1890. https://www.sciencedirect.com/science/article/pii/S0960894X19303555?via%3Dihub
2. Tainaka K, et al. Chemical Landscape for Tissue Clearing Based on Hydrophilic Reagents. Cell Rep. 2018, 24(8):2196-2210.e9. https://www.sciencedirect.com/science/article/pii/S2211124718311598?via%3Dihub
3. Tainaka K, et al. Whole-body imaging with single-cell resolution by tissue decolorization. Cell. 2014, 159(4):911-24. https://www.sciencedirect.com/science/article/pii/S0092867414013610?via%3Dihub
4. Susaki EA, et al. Whole-brain imaging with single-cell resolution using chemical cocktails and computational analysis. Cell. 2014, 157(3):726-39. https://www.sciencedirect.com/science/article/pii/S0092867414004188?via%3Dihub