

EASY DEEP BRAIN IMAGING BY TISSUE CLEARING IN MICROENVIRONMENTS OF MODEL ORGANISM

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In the brain tissue studies, deep imaging is very important because various cell types and blood vessels are spatiotemporally changes with developmental stage and neural disease. Recently, many optical clearing techniques were developed to improving depth penetration of tissue and resolution. However, these techniques still have many limitations such as light scattering, tissue distortions, fluorescent bleaching and image aberrations.

Here, we introduces a new clear matching (CM) solution base on aqueous which is simultaneously tissue clear and reflex index (RI) matching. CM solution can be rapidly cleared for ~1.5hr without fragility using 1mm brain slices which is depth limitation of multiphoton microscopy. These clearing tissues were highly preserved fluorescent protein until 40 days over and maintained low viscosity of high reflex index solution (~1.46) status without crystallization by air dry. we used whether we can identify the neuronal connetomics and cell to cell connetion in microenviroments of specific tissue. Therefore, we suggest CM solution enables facile 3D volume imaging and applicate to various tissue microenvironment changes.

[1] Richardson DS and Lichtman JW. "Calrifying tissue clearing" Cell 162, 246-257. (2015).