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Improved system for imaging of large biological samples in high refractive index solutions

Tech ID: 33066 / UC Case 2019-662-0

BRIEF DESCRIPTION

Novel system for imaging of specimens in high refractive index solutions on the Zeiss Z.1 fluorescence light sheet microscope. System will allow for deep imaging of large and intact biological samples (i.e. mouse brain) for enhanced optical resolution and faster imaging speed.

SUGGESTED USES

- Fluorescence imaging of large biological specimens
- Include all intended uses specified in the ROI, intake, or conversations with the inventor

FEATURES/BENEFITS

- Accelerate R&D discoveries and basic biology knowledge for research groups utilizing whole organ clearing + imaging
- Insights into biological phenomenon in intact brains/other clearable organs
- Removes the requirement of slicing brain tissue into thin sections for individual imaging
- Enhanced speed, spatial resolution, and specimen size for fluorescence light sheet imaging

TECHNOLOGY DESCRIPTION

Newly developed methods such as iDISCO have made it possible to image deep into complex organ systems (such as the brain) by making the organ optically transparent. This method requires the use of solutions containing a higher refractive index (RI), a measure of how much light scatters upon hitting said solution. However, current methods for mounting biological specimens for imaging on fluorescence microscopes use chambers compatible with solutions containing a low RI. Attempting to image optically cleared organs in these chambers result in mispositioned light that limits the imaging resolution and effective imaging area.

Researchers at UC Irvine have developed a new system that allows for the imaging of large biological specimens in high refractive index solutions on the Zeiss Z.1 fluorescence light sheet microscope. This new imaging system allows for improved optical sectioning in high RI solutions, increased imaging speed for larger samples, and imaging of larger biological samples via a larger chamber volume and new specimen mounting hardware. This will allow for high-resolution, fast, 3-dimensional imaging of whole brains, featuring new software and hardware specs compatible with the Zeiss Z.1 fluorescence light sheet microscope.

STATE OF DEVELOPMENT

Final prototype stage

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OTHER INFORMATION

CATEGORIZED AS

- » **Imaging**
 - » 3D/Immersive
- » **Medical**
 - » Imaging
 - » Research Tools
- » **Research Tools**
 - » Other

RELATED CASES

2019-662-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,187,659	11/30/2021	2019-662

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