PRESS RELEASE / PRESSEINFORMATION

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Real-time 3D imaging of living organisms at sub-cellular resolution

Leica Microsystems to develop SCAPE microscopy

Mannheim/Wetzlar, Germany. Leica Microsystems CMS GmbH has entered into an exclusive, worldwide licensing agreement with Columbia University in New York to commercialize SCAPE microscopy for Life Science applications. SCAPE (**s**wept **c**onfocally **a**ligned **p**lanar **e**xcitation) microscopy forms 3D images of living samples by scanning them with a sheet of laser light. SCAPE's unique capabilities allow scientists to perform fundamentally new kinds of experiments, from imaging individual neurons firing throughout the brain of adult fruit flies, to tracking calcium waves through cells in the beating heart of a zebrafish. SCAPE also stands to create new inroads for understanding diseases such as cancer, and for the development of new drugs and therapies.

SCAPE microscopy was developed in the laboratory of Elizabeth Hillman, PhD, associate professor of biomedical engineering and radiology at Columbia University and a principal investigator at Columbia's Mortimer B. Zuckerman Mind Brain Behavior Institute. SCAPE's ingenuity lies in being able to both scan and image a moving light sheet through a single, stationary objective lens. SCAPE delivers 3D-imaging speeds that are 10 to 100 times faster than conventional point-scanning microscopes, while maintaining the benefits of light-sheet imaging including low photodamage. Compared to conventional light-sheet microscopes that require multiple objective lenses and complex sample positioning, SCAPE's patented single-objective approach greatly diversifies the range of intact and freely moving samples that can be imaged in 3D at near video-rates. SCAPE technology was recognized late last year with a prestigious grant award from the National Institutes of Health BRAIN Initiative.

"SCAPE's ability to perform real-time 3D imaging at cellular resolution in living, freely moving organisms is a new frontier for neuroscience research," said Dr. Hillman. "Beyond neuroscience, SCAPE is enabling fundamentally new scientific experiments by transforming our ability to capture 3D structure and function, movement, behavior and cellular activity in real-time across a wide range of organisms and biological samples."

In addition to their own intellectual property, Leica Microsystems has also exclusively licensed OPM (Oblique Plane Microscopy) technology from Imperial Innovations. The technology was invented by Christopher Dunsby, PhD, Faculty of Natural Sciences, Department of Physics at Imperial College London. "Leica Microsystems is committed to investing in the most promising technologies in order to drive our innovation, and these are excellent examples of that strategy" said Markus Lusser, President of Leica Microsystems. "We recognize that the accelerating use of GCaMPs, fluorescent reporters and

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optogenetics presents an urgent need for high-speed volumetric imaging of living samples – and that this is a current major gap in the microscopy market. We are thrilled to have the opportunity to develop next-generation imaging systems that will drive discoveries in neuroscience, biology and medicine by capturing life in action" – said Prof. Julian F Burke, Chief Scientific Officer of Leica Microsystems.
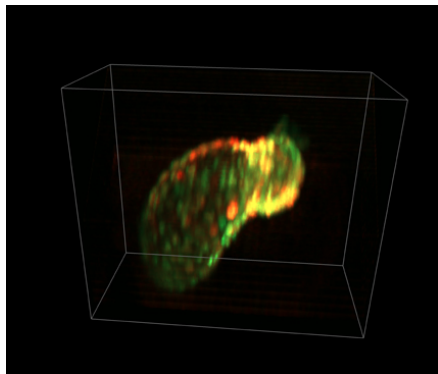
Caption: Zebrafish heart: Beating heart of zebrafish larva (56 hours after fertilization). Myocytes are expressing GCaMP (calcium indicator) and dsRed (cell marker). Imaged in-vivo using SCAPE at 25 volumes per second. 335 x 288 x 156 micron field of view. Credit: Hillman/Li/Targoff, Columbia University
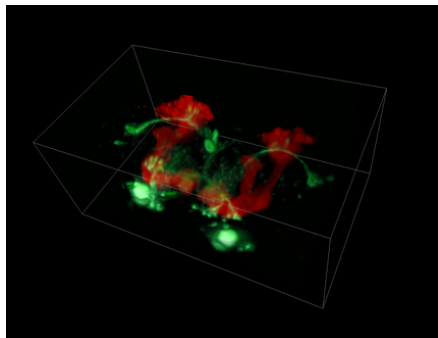
Caption: Fruit fly brain: Whole brain of adult Drosophila acquired in-vivo at 10 volumes per second using SCAPE. Neuronal subset expressing GFP (green), mushroom body neurons expressing dsRed. 450 x 264 x 227 micron field of view. Credit: Hillman/Li/Schaffer, Columbia University

About Leica Microsystems

Leica Microsystems develops and manufactures microscopes and scientific instruments for the analysis of microstructures and nanostructures. Ever since the company started as a family business in the nineteenth century, its instruments have been widely recognized for their optical precision and innovative technology. It is one of the market leaders in compound and stereo microscopy, digital microscopy, confocal laser scanning microscopy with related imaging systems, electron microscopy sample preparation, and surgical microscopes.

Leica Microsystems has seven major plants and product development sites around the world. The company is represented in over 100 countries, has sales and service organizations in 20 countries, and an international network of distribution partners. Its headquarters are located in Wetzlar, Germany.

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About Columbia University

Among the world's leading research universities, Columbia University in the City of New York continuously seeks to advance the frontiers of scholarship and foster a campus community deeply engaged in the complex issues of our time through teaching, research, patient care and public service. The University is comprised of 16 undergraduate, graduate and professional schools, four affiliated colleges and seminaries in Manhattan, and a wide array of research institutes and global centers around the world. More than 40,000 students, award-winning faculty and professional staff define the University's underlying values and commitment to pursuing new knowledge and educating informed, engaged citizens. Founded in 1754 as King's College, Columbia is the fifth oldest institution of higher learning in the United States.