Hiiragi group and Prevedel group collaborate with Prospective Instruments to pioneer intravital multiphoton microscopy

Prof. Takashi Hiiragi, Dr. Robert Prevedel , and Dr. Lukas Krainer have launched an interdisciplinary collaboration to develop a novel intravital microscopy.

DORNBIRN, AUSTRIA, November 14, 2025 /EINPresswire.com/ -- Hiiragi group and Prevedel group collaborate with Prospective Instruments to Pioneer Intravital Multiphoton Microscopy for Early Embryo Research

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Prof. Takashi Hiiragi (Hubrecht Institute), Dr. Robert Prevedel (European Molecular Biology Laboratory), and Dr. Lukas Krainer (Prospective Instruments) have launched an interdisciplinary collaboration to develop a novel intravital microscopy platform for studying mammalian embryo implantation.

Prof. Takashi Hiiragi explains:

“Our research explores how self-organisation drives the emergence of forms and patterns in early mammalian embryos. By combining genetics, microscopy, biophysics, engineering, and modelling, we investigate how a seemingly simple cluster of cells develops into organised structures.”

Prof. Takashi Hiiragi continues:

“To study embryo development in the uterus, we established a new interdisciplinary collaboration with the Prevedel group at EMBL Heidelberg and the industry partner Prospective Instruments to build the intravital microscope. We have extensively tested each microscope component to identify and observe the embryo-uterus interaction, and optimized and finalized its design. The mammalian implantation process is largely enigmatic, and the dynamic embryo-uterus interaction and its underlying mechanisms are poorly understood. This new intravital microscope will provide a fresh window and potentially transform the research of early mammalian development. Fortunately, Prospective Instruments could provide the level of

customizable design we needed to enable our imaging research."
Dr. Lukas Krainer added:
"We are excited to participate in a project that truly pushes the limits of multiphoton imaging by combining such diverse imaging modalities. For many years, we have been supporting researchers with our state-of-the-art multiphoton microscopy solutions. Now, by integrating high-resolution spectral domain optical coherence tomography (OCT) in an automated and user-friendly system, we enable researchers to gain insights from their samples that were not possible before."
About Hiiragi group – Hubrecht Institute
The Hiiragi group aims to understand what defines multicellular living systems. In particular, the group studies the design principle of tissue self-organization, using early mammalian embryos as a model system. To this end, they developed an experimental framework that integrates biology, physics and mathematics. Their recent studies led to a model in which feedback between cell fate, polarity, and cell and tissue mechanics underlies multicellular self-organization. The group adopts a wide variety of experimental strategies including embryology, genetics, advanced microscopy, biophysics, engineering and theoretical modelling, in order to address fundamental questions in cell and developmental biology.
About Prevedel group - EMBL Heidelberg
The Prevedel group focuses on pushing the frontiers of deep tissue microscopy in terms of imaging depths and resolution by developing advanced and innovative optical imaging techniques. They also actively engage in developing and establishing unconventional imaging approaches such as Brillouin microscopy to 'image' mechanical properties of living tissues in a non-contact fashion and with diffraction-limited resolution in 3D.
About Prospective Instruments
Prospective Instruments builds innovative, modular multiphoton microscopes and femtosecond lasers, designed to adapt to the evolving needs of the research community. With a mission to empower scientists and clinicians through customizable and automated imaging systems, we make multiphoton microscopy intuitive, simplify workflows, and accelerate discoveries.

Visit www.p-inst.com to learn more about Prospective Instruments and the various solutions they offer.
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