

The transparent organism

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A novel high-tech microscope will be brought to the marketplace, giving laboratories everywhere fascinating new insights into living organisms. EMBLEM Technology Transfer GmbH [EMBLEM], the commercial entity of the European Molecular Biology Laboratory [EMBL], announced today that it has signed a licensing deal with technological leader Carl Zeiss to commercialize a new technology called SPIM [Selective Plane Illumination Microscopy].

"Microscopes have to evolve to keep up with the demands of modern science," says Ernst Stelzer, whose group at EMBL developed SPIM. "Molecular biology has graduated upwards from studying single molecules – now we need to watch complex, three-dimensional processes in whole, living organisms. SPIM allows us to do that with unprecedented quality."

In a series of technical innovations, Stelzer and his colleagues [in particular Jim Swoger and Jan Huisken] have made it possible to make three-dimensional films of the inner workings of living organisms at a much higher level of detail than ever before.

One innovation of SPIM is the illumination of a sample from the side rather than along the traditional view of the microscope lens. This eliminates a problem that has plagued three-dimensional microscopy in the past: researchers could obtain excellent resolution in the plane of the microscope slide, but resolution along the direction of the viewer was very fuzzy. In SPIM, a sample is passed through a thin sheet of light, capturing high-quality images layer-by-layer. The sample can be rotated

and viewed along different directions, further eliminating the blurry and unwanted light which prevented scientists from looking deep into tissues in the past. The entire procedure is very fast and in a computer supported post-processing step, one or more stacks of images are assembled into a highresolution film.

Another advantage of SPIM is that the specimen is kept alive in a liquid-filled chamber, allowing scientists to track developmental processes like the formation of eyes and the brain in embryonic fish or other model organisms.

The presentation of SPIM at scientific conferences has generated a flood of requests for the instrument.

"We were extremely pleased to have found Carl Zeiss as an excellent partner to translate this technology into a product," says Dr. Martin Raditsch, Deputy Managing Director of EMBLEM.

EMBL Director-General Prof. Fotis Kafatos and EMBL Group Leader Dr. Ernst Stelzer met with the Member of the Executive Board of the Carl Zeiss Group, Dr. Norbert Gorny and with the Executive Vice President and General Manager of the Business Group Microscopy from Carl Zeiss, Dr. Ulrich Simon, last month to finalize the details.

"We see the SPIM technology as an ideal approach for satisfying the growing demand in highly resolved image information from living organisms. The products based on this technology will form a perfect match with our lines of confocal and multiphoton 3D-imaging systems," says Dr. Simon.

Source: European Molecular Biology Laboratory

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