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LaVision BioTec reports on the neuro research on the human brain after trauma by Dr Ali Ertürk from the Institute for Stroke and Dementia Research at LMU Munich.

Bielefeld, 25th August 2015: LaVision BioTec, developers of advanced microscopy solutions for the life sciences, report on the work of Ali Ertürk, a Group Leader at the Institute for Stroke and Dementia Research (part of the Klinikum der Universität München) at the Ludwig Maximilians University in Munich, Germany.

Dr Ali Ertürk has been using light sheet and 2-photon microscopy in his research for a number of years during work in both the USA (with Genentech) and currently in Germany in the Klinikum der Universität München (KUM), of the Ludwig Maximilians University (LMU) in Munich. He is now Group Leader of the Acute Brain Injury Research Group where his main interest is in understanding key mechanisms leading to neurodegeneration after traumatic brain injury. At present, virtually nothing is known about how the initial trauma alters the brain structure over months/years and ultimately its function.

Dr Ertürk describes the challenges he faces. "One of the main struggles in neuroscience in general is the difficulty to accurately analyze long connections in the brain using tissue sections which deliver only limited spatial information. We use a novel approach aiming at mapping the acute and chronic changes in the entire brain caused by small, well-defined brain lesions. To map the pathological brain, we utilize cutting-edge imaging techniques including high-resolution 3D imaging of the entire brain – that we recently developed – and in *vivo 2*-photon imaging. Subsequently, we screen for novel molecular players that are altered in chronically affected brain regions to halt secondary neurological problems."

Choosing the instrumentation from LaVision BioTec for his laboratory in Munich started with his experience gained using their first generation UltraMicroscope while in Genentech's Department of Neuroscience. He was a member of the development team which discovered a highly reproducible and versatile clearing procedure called 3D imaging of solvent-cleared organs, or 3DISCO, which is applicable to diverse tissues including brain, spinal cord, immune organs and tumors.[1,2] This has continued in Munich where he images entire transparent rodent brains. As Dr Ertürk says, the UltraMicroscope is the only commercial solution for this type of imaging where he looks at centimeter

lengths of tissue. He also makes use of a two-photon microscope for higher resolution imaging of transparent organs albeit with a smaller field of view.

To receive more details about LaVision BioTec's TriM Scope II 2-Photon Microscope and the UltraMicroscope II for light sheet microscopy, please contact LaVision BioTec on +49 (0)5219151390, visit the web site: www.lavisionbiotec.com.

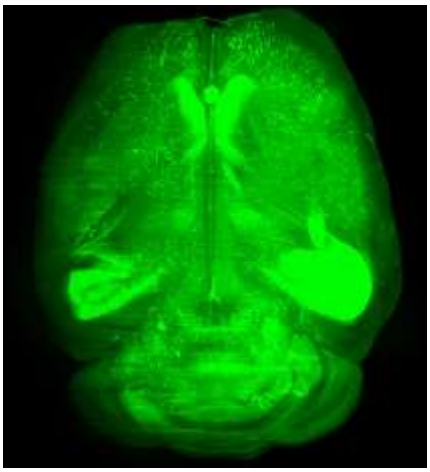
References:

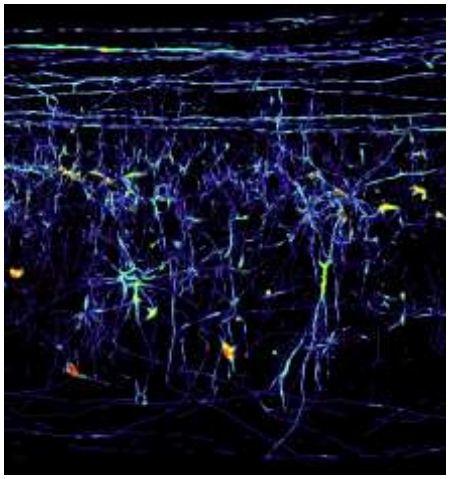
1 Ertürk A, Becker K, Jaehrling N, Mauch CP, Hojer CD, Egen J, et al. (2012): Three-dimensional imaging of solvent cleared organs using 3DISCO. *Nature Protocols* Oct 11;7(11):1983-95 (Cover article of the 2012 November *Nature Protocols* issue).

2 Ertürk A, Mauch C.P., Hellal F., Forstner F., Keck T., Becker K., Jahrling N., Steffens H., Richter M., Hubener M., et al. (2012): Three-dimensional imaging of the unsectioned adult spinal cord to assess axon regeneration and glial responses after injury. *Nature Medicine* 18, 166-171. (Cover article of the 2012 January *Nature Medicine* issue).

Attachments:

Dr Ali Ertürk, Group Leader of the Acute Brain Injury Research Group at the Klinikum der Universität München, part of the LMU.





Left: Whole brain of a GFP-M mouse, which was cleared with 3DISCO method and then imaged with the LaVision UltraMicroscope.

Right: Neuronal connections in the spinal cord of a GFP-M mouse (3DISCO clearing and 2-photon imaging).

For high resolution copies of these images, either right click to download, or contact Jezz Leckenby at Talking Science.

About LaVision BioTec GmbH

LaVision BioTec was founded in 2000 to develop and manufacture advanced microscopy solutions for the life sciences. There are currently two product lines:

TriM Scope II is a modular multi-photon/confocal microscopy platform that combines single- and multi-beam operation in one microscope. This allows for deep in-vivo imaging with Ti:Sapphire, OPO and visible lasers simultaneously with frame rates up to 60 Hz. PMTs, TCSPC and CCD detectors, multicolour imaging, spectral discrimination, FLIM/FRET capabilities and adaptive optics provide customization of the TriM Scope.

UltraMicroscope II utilizes six thin light sheets to excite samples with fluorescence light which is detected with a sCMOS-equipped microscope mounted perpendicular to the plane of illumination. Moving the sample through the light sheets generates 3D image stacks at cellular resolution.

For more details, please visit www.lavisionbiotec.com.

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