

JPK Instruments contact:

Gabriela Bagordo: +49 30726243 500

Media contact:

Jezz Leckenby: +44 (0)1799 521881

JPK's NanoWizard® AFM and CellHesion® systems are used to shed light on the development and regeneration of the central nervous system in the Franze group at the University of Cambridge

Berlin, September 22nd 2016: JPK Instruments, a world-leading manufacturer of nanoanalytic instrumentation for research in life sciences and soft matter, reports on the use of their NanoWizard® AFM and CellHesion® systems in the Department of Physiology, Development & Neuroscience at the University of Cambridge.

Dr Kristian Franze is a lecturer in the Department of Physiology, Development and Neuroscience at the University of Cambridge. His major goal is to understand when, where and how mechanical signals, such as forces and local tissue stiffness, are involved in controlling cell development and function in the nervous system. With their JPK systems, they particularly want to figure out what the mechanical environment of cells in the central nervous system (CNS) looks like in the developing embryo as well as in regenerating spinal cord and brain tissue. Using AFM and CellHesion® techniques among other microscopies, both commercial and custom-made, Dr Franze and others have shown that nervous tissue is mechanically heterogeneous. Furthermore, they found that neurons constantly exert forces on their environment and that both neurons and glial cells respond to mechanical cues. Understanding how and when CNS cells actively exert forces and respond to their mechanical environment will shed new light on CNS development and could eventually lead to novel biomedical approaches to treat or circumvent pathologies that involve mechanical signaling.

AFM is well-accepted and the addition of a CellHesion® module greatly increases the force measurement capabilities. It provides the quantification of single cell-cell and cell-surface interactions under physiological conditions. In parallel to these forces, cytomechanical characteristics including stiffness and elasticity can be determined. In [Dr Franze's group](#), the CellHesion® setup enables the measurement, for example, of brain tissue stiffness in living frog embryos with cellular resolution and the simultaneous observation of how fluorescently labelled neurons grow in that region.

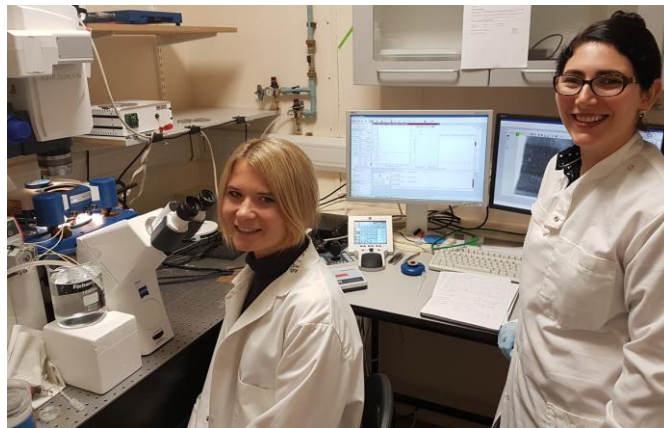
Dr Franze has been using NanoWizard® AFMs from JPK since 2002 when he bought his first system as a PhD student. He has continued to select systems from JPK ever since. Discussing his reasons for choosing systems from JPK, he says, "I very much appreciate the long working distance in z of 100 µm. This is key for the raster measurements of

whole tissues in living embryos. I also like the ability of the ExperimentPlanner™ which allows us to easily design our own experiments. The support we get from JPK's Alex Winkel is quite superb and underscores why we have such a great relationship with the company."

2016 has been a good year for publication of the group's research. Amongst others, they have had a paper in *Nature Neuroscience*¹ (which contains the *in vivo* brain mechanics measurements).

For more details about JPK's NanoWizard® AFM and its applications for the bio & nano sciences, please contact JPK on +49 30726243 500. Alternatively, please visit the web site: www.jpk.com or see more on Facebook: www.jpk.com/facebook and on You Tube: <http://www.youtube.com/jpkinstruments>.

Attachment



***Dr Isabell Weber and Joy Thompson from the Franze Group
with their JPK NanoWizard® system.***

For a high resolution copy of the image, either right click to download or contact Jezz Leckenby at Talking Science.

Reference

- 1 Mechanosensing is critical for axion growth in the developing brain, Kristian Franze *et al*; *Nature Neuroscience* (2016) doi:10.1038/nn.4394

About JPK Instruments

JPK Instruments AG is a world-leading manufacturer of nanoanalytic instruments - particularly atomic force microscope (AFM) systems and optical tweezers - for a broad range of applications reaching from soft matter physics to nano-optics, from surface chemistry to cell and molecular biology. From its earliest days applying atomic force microscope (AFM) technology, JPK has recognized the opportunities provided by nanotechnology for transforming life sciences and soft matter research. This focus has driven JPK's success in uniting the worlds of nanotechnology tools and life science applications by offering cutting-edge technology and unique applications expertise. Headquartered in Berlin and with direct operations in Dresden, Cambridge (UK), Singapore, Tokyo, Shanghai (China), Paris (France) and Carpinteria (USA), JPK maintains a global network of distributors and support centers and provides on the spot applications and service support to an ever-growing community of researchers.

For further information:

JPK Instruments AG

Colditzstrasse 34-36

Haus 13, Eingang B

Berlin 12099

Germany

T +49 30726243 500

F +49 30726243 999

www.jpk.com

bagordo@jpk.com

Talking Science Limited

39 de Bohun Court

Saffron Walden

Essex CB10 2BA

United Kingdom

T +44 (0)1799 521881

M +44 (0)7843 012997

www.talking-science.com

jezz@talking-science.com