

JPK Instruments contact:

Gabriela Bagordo: +49 30726243 500

Media contact:

Jezz Leckenby: +44 (0)1799 521881

Oxford University “Research Hotel” combines the JPK NanoWizard® AFM with a toolbox of microscopy techniques.

Berlin, 26th November 2015: JPK Instruments, a world-leading manufacturer of nanoanalytic instrumentation for research in life sciences and soft matter, reports on how their NanoWizard® AFM system is being combined with a toolbox of fluorescence microscopy techniques at the Weatherall Institute of Molecular Medicine located at Oxford University.

The Weatherall Institute of Molecular Medicine (WIMM) at Oxford University comprises various groups involved in molecular medicine research forming a “Research Hotel.” They all come from different medical departments and also different topics (immunology, haematology, oncology, neurobiology), but their joint efforts within one place and the possibility to use state-of-the-art facilities shall optimize research efforts and bolster novel results.

Dr Marco Fritzsche works in the Nano-Immunology group of Professor Christian Eggeling in the MRC Human Immunology Unit (HIU) at the WIMM. Their specialty areas include cell mechanics and the use of FRAP. They combine AFM with a toolbox of fluorescence microscopy techniques to investigate the mechanisms of actin cytoskeleton-mediated force generation during triggering of immune cells such as the activation of T-cells. These experiments are the starting point for comprehensive quantitative studies of mechanical force in the context of health and disease.

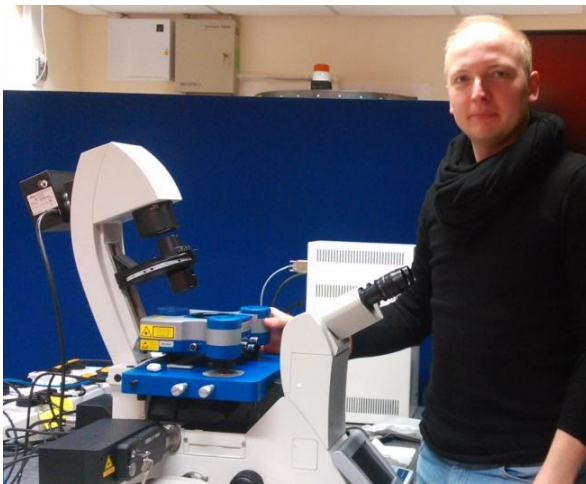
This work uses many of the recent developments of the family of microscope techniques commonly referred to under the title of super-resolution microscopies. In recent years, biomedical researchers have increasingly recognized the importance of forces within biological systems, ranging from the spreading of cancerous cells to the triggering of the immune system resulting in the atomic force microscope (AFM) being adopted by many research groups on a daily basis. However, to date, no system had been available within the Oxford microscope facilities serving biological research for directly measuring or enforcing forces on cells. The way cells interact with each other is often ruled by physical changes due to motion, so-called mechanical force. Such forces are present during molecular rearrangements and are observed most obviously when cells form close contacts, avoid each other or reshape to change morphology. Forces play an important

role in many biomedical processes. The new JPK AFM setup will eventually be integrated into the image facility at the WIMM (the Wolfson Imaging Centre), offering the possibility for less-experienced users to address questions about force involvement in their biomedical research.

Dr Fritzsche and the Nano-Immunology group use a toolbox of different nanoscopy and microscopy techniques. This involves custom-built and commercially available microscopes such as Stimulated Emission Depletion (STED) microscopy, STORM, as well as confocal scanning, spinning disk microscopy, widefield technologies and TIRF. Moreover, they have implemented quantitative microscopy and spectroscopy methods such as FRAP, point FCS, scanning FCS, FLIM, and FRET. Dr Fritzsche sees several benefits in choosing JPK's system: "What is particularly important for our experiments is the ability of the JPK NanoWizard® AFM to move the sample instead of the head and the ability to pull and push with a dynamic range of 15 μm . This way, we can quantify the mechanical properties of the cells but also functionalise cantilevers with antibodies and receptor ligands and study the forces exerted by the immune cells in response to these ligands."

For more details about JPK's NanoWizard® AFM and their 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 Marco Fritzsche of the Weatherall Institute of Molecular Medicine at Oxford University with the JPK NanoWizard®

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

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