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JPK launches the OT-AFM Combi-System - the world's first combined system to provide optical tweezers and atomic force microscopy

Berlin, December 14th, 2016: JPK Instruments, a world-leading manufacturer of nanoanalytic instrumentation for research in life sciences and soft matter, announce the release of the world's first combined system to provide optical tweezers and atomic force microscopy on a single inverted light microscope platform.

Based on years of leadership in the fields of atomic force microscopy and optical tweezers for applications in nanotechnology for life science, JPK have brought the technologies together on a single inverted light microscope platform. The OT-AFM Combi-System pairs the exceptional surface force measurement and imaging capabilities of AFM with the ability of optical tweezers to apply and measure smallest forces in 3D.

The unique combination of 3D positioning, detection and manipulation provided by OT and the high-resolution imaging and surface property characterization of AFM opens up a whole new spectrum of applications.

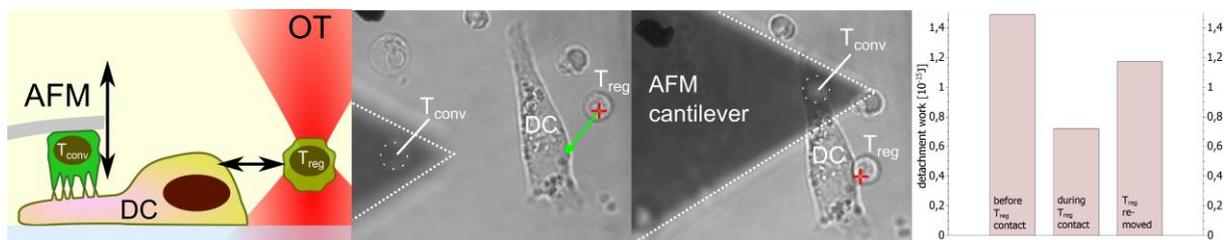
The OT-AFM Combi-System fulfills the highest demands on mechanical stability, flexibility and modularity. A specially designed OT-AFM ConnectorStage™ is the key to combining any AFM of the NanoWizard® or CellHesion® family with the NanoTracker™ optical tweezers on a research-grade inverted optical microscope. JPK's established hardware and software integration of high-end optical methods like TIRF or confocal fluorescence microscopy with both AFM and OT provides correlated data easily. Dynamic processes can be controlled with the non-invasive power of light while data is being simultaneously collected with the AFM. Single molecules and living cells can be manipulated in 3D with additional degrees of freedom in force measurement. Dual force measurement applications are supported by JPK's camera-based OT force detection system.

New applications are now available to users. Cellular response, cell-cell or cell matrix interactions, immune response, infection or bacterial/virus/nanoparticle uptake processes are just some of the examples that can be investigated with the new OT-AFM platform. JPK's proven AFM and OT core technologies, combined with fluorescence microscopy, have set the ultimate benchmark for live cell applications.

JPK CTO, Torsten Jähnke, describes one exciting breakthrough. "Triggering cellular responses by using functionalized particles or modified microorganisms is a common method. The resulting changes in cellular structure, dynamics and mechanical properties can be investigated using AFM-based methods. However, delivering objects to specific regions of interest on the cell is very difficult to achieve. OT provides the perfect tool for manipulating the sample and triggering cellular response, at a precise time and location. This significantly improves the throughput, flexibility and reproducibility of these studies. In this application, the influence of signaling between dendritic cells (DCs) and regulatory T-cells (T_{reg}) on the adhesion of conventional T-cells (T_{conv}) to the same DC is quantified by our unique OT-AFM Combi-System."

For more details about JPK's OT-AFM Combi-System 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 YouTube: <http://www.youtube.com/jpkinstruments>.

Attachment



Schematic to show an example of the triggering immune signaling experiment (sample courtesy and original experiment design by Yan Shi, University of Calgary/ Tsinghua University, Beijing, publication in print)



The JPK OT-AFM Combi-System

For high resolution copies of the images, 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.

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