

JPK Instruments contact:

Claudia Boettcher: +49 30533112070

Media contact:

Jezz Leckenby: +44 (0)1799 521881

JPK reports on the research activities of the Nanophysics Group at the Istituto Italiano di Tecnologia based in Genova.

Berlin, 16th of April 2013: JPK Instruments, a world-leading manufacturer of nanoanalytic instrumentation for research in life sciences and soft matter, reports on the research studies of the nanophysics group to couple the chemical information of STED microscopy with the high resolution spatial and force measurements provided by AFM to study biological samples in liquid.

The Istituto Italiano di Tecnologia (IIT) was founded in 2003 in the city of Genova to promote Italy's technological development and advanced education. Professor Alberto Diaspro is the Director of the Department of Nanophysics. His research includes the design, realization and utilization of optical and biophysical instrumentation such as far-field super resolution optical microscopy and nanoscopy, conventional and confocal microscopy, two-photon fluorescence microscopy and spectroscopy architecture, and scanning probe microscopy (STM, SNOM, AFM). This last area has led to collaborations with JPK Instruments.

Dr Claudio Canale is a team leader in the group focusing on the application of scanning probe techniques in the study of bio-materials and bio-mechanisms. One of his main projects has been to couple STED (stimulated emission depletion microscopy) and atomic force microscopy (AFM). Describing this work, Dr Canale said "in our department, an entire group works on the development of optical super-resolution techniques and this has led to a STED microscope based on a conventional multi-photon platform from Nikon Instruments. Together with Dr Benjamin Harke, we had the idea to couple the capability of this instrument with those offered by an AFM. For the AFM, we chose the NanoWizard® from JPK."

There have been several iterations of the new combined set-up. This work has been reported in a paper published by the group in the journal, *Optical Nanoscopy*¹. Now, the main goal is to characterize biological processes having simultaneous access to morphological and mechanical properties and coupling both of them with chemical recognition capability directly provided by STED with a resolution in the order of tens of nanometers. Working on model membranes, Dr Canale says "we can recognize target molecules or particular membrane components by STED and we can look at the fine structural and mechanical changes by AFM."

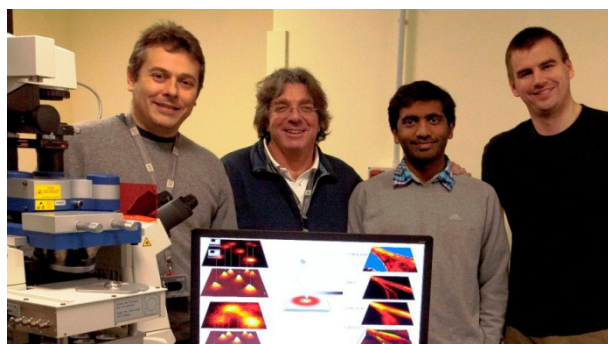
The choice of JPK's AFM came after experience using many different commercial AFM systems. Settling on the NanoWizard, Dr Canale comments "I found the JPK system extraordinarily comfortable for this application. I think that JPK have produced a system with a special aptitude towards biology. This approach to the development of stable systems that provide state of the art performance applications in liquid with a user-friendly approach that makes the system easily accessible not only to users with a physical background but also to biologists and biochemists. In particular, I have been

impressed by the unique capability of this instrument to work in a liquid environment with both nanometric spatial and piconewton force resolution.”

For more details about JPK’s specialist products and applications for the bio and nano sciences, please contact JPK on +49 30533112070, visit the web site: www.jpk.com or see more on Facebook: www.jpk.com/facebook and YouTube: <http://www.youtube.com/jpkinstruments>.

Reference: 1) Harke et al., *Optical Nanoscopy* 1:3 (2012)

Attachment:



Dr Claudio Canale, Professor Alberto Diaspro, Jenu Chacko-Varghese and Dr Benjamin Harke – the group to have coupled STED and AFM at the Department of Nanophysics, IIT, Genova.

About JPK Instruments

JPK Instruments AG is a world leading manufacturer of nanoanalytic instruments that enable unparalleled access at the nanotechnology level. JPK was recognized as Germany's fastest growing nanotechnology company in 2007 and 2008 (Deloitte). The product portfolio is based around atomic force microscopes and optical tweezers for a wide range of applications, from soft matter physics to nano-optics, from surface chemistry to cellular and molecular biology. Leading-edge instruments from JPK are used by the most renowned research institutes across the world. Headquartered in Berlin and with operations in Dresden (Germany), Cambridge (UK), Singapore, Tokyo (Japan) and Paris (France), 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.

JPK Instruments AG
Bouchéstrasse 12
Haus 2, Aufgang C
Berlin 12435
Germany
T +49 30533112070
F +49 30 5331 22555
www.jpk.com
cl.boettcher@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