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JPK reports on the study of structure and dynamics of biological membranes using AFM and advanced fluorescence microscopies in Pierre-Emmanuel Milhiet's group at the CBS in Montpellier

Berlin, 15 October 2013: JPK Instruments, a world-leading manufacturer of nanoanalytic instrumentation for research in life sciences and soft matter, reports on how AFM and advanced fluorescence microscopy is being applied in the study of biological membranes in the Centre de Biochimie Structurale (CBS, CNRS and INSERM affiliated) in Montpellier (France).

The CBS includes a research group focused on single molecule physics. Dr Pierre-Emmanuel Milhiet runs a team which applies AFM and advanced fluorescence microscopies (single molecule tracking and single-molecule localization microscopy or SMLM) in the study of both structure and dynamics of biological membranes.

Speaking about his work, Dr Milhiet says "One of our aims is to decipher the molecular mechanisms involved in the lateral segregation of membrane components using artificial bilayers and intact cell membranes. Part of our activities is also to develop new methodologies and we have recently mounted a new setup combining a JPK AFM and home-made SMLM (especially PALM and STORM). The main motivation came from the fact that the lateral resolution that can be achieved with an AFM on intact cells is in the same range than that obtained by SMLM (a few tens of nanometers), making possible the precise identification of structures imaged by the tip. We are also involved in the development of high-speed AFM for imaging biological membranes as part of a collaborative effort with Professor Toshio Ando's group in Japan."

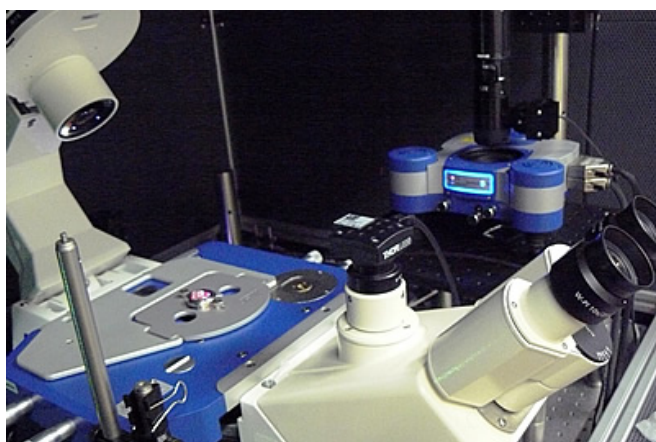
His team uses AFM because it is an outstanding tool to investigate membrane topography. Because of its vertical and lateral resolution, structure of membrane assemblies can be observed and single molecule (protein or DNA) can be delineated by the tip. The possibility to work in liquid is another tremendous advantage as compared to other structural biology techniques.

Dr Milhiet selected the JPK system because "It is a very stable machine for a stand-alone AFM allowing single protein resolution to be achieved on biological membranes. The HyperDrive™ mode is especially suitable for this purpose. Also, JPK's Tip-Assisted Optics stage can be combined with tip scanning which is very useful for compensating the drift of the sample stage which may be observed during long-term SMLM acquisition. Combining single molecule fluorescence microscopies with AFM is important as it enables

us to understand that the integration of multiple methodologies over multiple length- and time-scales, from molecular to cellular levels, is necessary to tackle complex biological questions."

For more details about JPK's NanoWizard® and applications for the bio & 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 on You Tube: <http://www.youtube.com/jpkinstruments>.

Attachment:



JPK's NanoWizard® system in use at the CBS in Montpellier

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 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.

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