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JPK's NanoWizard® AFM system is being used for cell studies in the Research Centre for Nanometer-scale Science & Advanced Materials at the Jagiellonian University in Krakow, Poland.

Berlin, May 31st 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 system at the Jagiellonian University in Krakow where it is applied to make simultaneous imaging, mechanical and spectroscopy measurements.

Dr Marek Szymonski is a Professor at the Research Centre for Nanometer-Scale Science and Advanced Materials (NANOSAM) located at the Jagiellonian University in Krakow, Poland. The aim of his research is to understand the signals that govern intracellular communication between hepatocytes and liver sinusoidal endothelial cells (LSECs) and between cardiomyocytes and cardiac microvascular endothelial cells (CMECs). This is because these microvascular bed-specific mechanisms determine the phenotype of the endothelium in an organ-specific way and may constitute the pathophysiological basis for the hepato-selective and cardio-selective therapy of endothelial dysfunction. Impairment of endothelial function is a primary cause or a result of many human diseases.

AFM plays an important role in the research. It is apparent, that knowledge of endothelium mechanical properties at the cellular level is necessary for the proper understanding of the cell functionalities and mechanical response to both native and pathological environment. Professor Szymonski takes a full advantage of the development of AFM-based techniques: imaging, nanoindentation and intermolecular force spectroscopy. These are used to perform experimental and theoretical investigations on both the mechanical properties and functioning of the endothelial cells. The ultimate goal is to determine quantitative parameters of the EC nanomechanical phenotype (stiffness, effective Young's modulus) for various structural cell compartments (glycocalyx, cortical actin web, cytoplasm, and nucleus) and then to develop a nanomechanical model of endothelial dysfunction which could be practically used for "in vitro" investigations.

Professor Szymonski described his work applying AFM and what led him to the use of JPK's NanoWizard® platform, "AFM-based microscopy and spectroscopy techniques applied to biological materials have been used in our laboratories over 15 years. In addition to AFM and often in parallel, we use optical fluorescence microscopy (confocal as well), Raman spectroscopy mapping (currently tip-enhanced Raman is of our particular

interest) and scanning electron microscopy (SEM). We chose JPK because of its open design which is particularly suitable for combined (integrated) optical microscopy, AFM force microscopy and spectroscopy measurements. It provides good technical conditions for tip-enhanced Raman mapping.”

For more details about JPK’s NanoWizard® AFM system and the applications for the bio & nano sciences, please contact JPK on +49 30726243 500. Alternatively, please visit the web site: www.jpkinstruments.com or see more on Facebook: [www.jpkinstruments.com/facebook](https://www.facebook.com/jpkinstruments) and on YouTube: <http://www.youtube.com/jpkinstruments>.

Attachment



Katarzyna Malek-Zietek, MSc, uses the JPK NanoWizard® AFM system at NANOSAM, Jagiellonian University in Krakow

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),



Nanotechnology for Life Science

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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