Nanotechnology for Life Science

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JPK reports on how the University of Glasgow is using their NanoWizard AFM and CellHesion module to study how cells interact with their surroundings.

Berlin, August 2nd, 2017: JPK Instruments, a world-leading manufacturer of nanoanalytic instrumentation for research in life sciences and soft matter, is pleased to report on the Yin group in the Division of Biomedical Engineering at the University of Glasgow. They are studying cells and how they react with their surroundings using JPK's NanoWizard® AFM and CellHesion® module.

Professor Huabing Yin is a senior lecturer in the Division of Biomedical Engineering at the University of Glasgow. Her research aims to understand how a cell interacts with its surroundings at the microscale level since this process is fundamental to a vast number of applications in health care. "We take a multidisciplinary approach, developing technologies to study cells in well-controlled microenvironments that resemble key features in their native habitats. Our research converges on micro-/nanofabrication, microfluidics, and advanced microscopic and spectroscopy technologies. These allow us to develop various integrated approaches for single cell analysis, linking biological function with chemistry and the physics of a cell."

Professor Yin describes her work with JPK's NanoWizard® AFM. "We use our AFM to quantify physical and mechanical properties (e.g. stiffness, viscoelasticity) of cells and their associated extracellular matrix. These properties are closely linked with cell functions in physiological (e.g. growth, differentiation; McPhee et al 2010) and pathological conditions. In collaboration with scientists in the Beatson Cancer Institute, we have shown the roles of cell stiffness (Cameron et al 2015) and extracellular matrix (Hernandez-Fernaud et al 2017) in cancer invasion. We also use our CellHesion® module to quantify the interaction between living cells and extracellular matrix. This offers a great capability for dynamic monitoring of cell-matrix interaction with nanoscale resolution."

The NanoWizard® has been particularly flexible for integration with other techniques. Professor Yin continues: "We have used various optical microscopic and spectroscopic techniques (such as Raman). We combine some of them, in particularly, fluorescence and TIRF imaging with AFM. This significantly enhances our ability to associate biological activity with the physics of cells. The JPK system is very reliable and easy to use. Our

NanoWizard® AFM has been used intensively for over ten years and it has never let us down."

For more details about JPK's AFM systems and their applications for the materials, life & 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.

References

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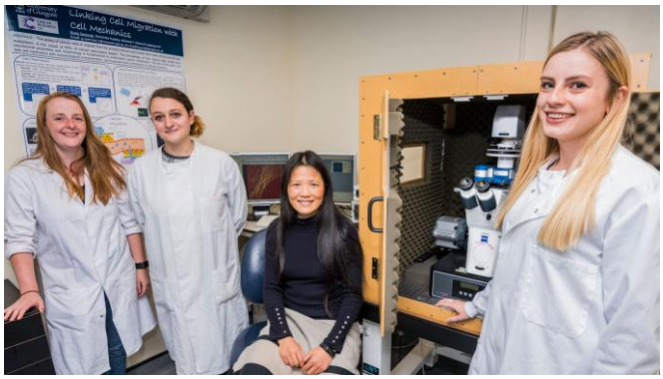
Attachments



Professor Huabing Yin (seated) and her students with their JPK NanoWizard® AFM with the CellHesion® module at the University of Glasgow.

One of Dr Yin's students, Louise Manson, works with the JPK NanoWizard® AFM.

For high resolution copies of the images, either right click to download or contact Jezz Leckenby at Talking Science.

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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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