Nanotechnology for Life Science

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JPK reports on the retrovirus research of Professor Itay Rousso and his colleagues at Ben-Gurion University in Israel using the NanoWizard® ULTRA Speed AFM.

Berlin, January 16th 2018: JPK Instruments, a world-leading manufacturer of nanoanalytic instrumentation for research in life sciences and soft matter, reports on the ground-breaking research into the understanding of the reproduction of retroviruses such as HIV at Ben-Gurion University in Beer-Sheba, Israel. This research uses JPK's NanoWizard® ULTRA Speed AFM.

Professor Itay Rousso leads a research group in the Department of Physiology and Cell Biology at Ben-Gurion University in Beer Sheba. Their focus is to uncover the physical mechanism underlying the replication machinery of enveloped retroviruses (primarily HIV). So far, they have studied the assembly and budding steps, viral entry and during the past three years, they have been studying the mechanism that triggers core disassembly and release of the viral genome – a process termed uncoating.

In the opinion of Professor Rousso, one of the major advantages of the AFM is its ability to study "live" samples under physiological environments with spatial resolution similar to that of the EM. This ability enables investigating dynamical processes as well as characterization of samples under native environments. His team studies specimen at sizes of 80-100 nm, which is well within the resolution limit of the AFM, which allow the investigation of viral associated process with sufficient resolution. Presently, the questions they investigate can hardly be addressed using other techniques.

With experience of different commercial systems, Dr Rousso talks about why the JPK system offers particularly helpful capabilities. "For us, the JPK system can provide some of the more advanced features such as quantitative imaging mode, QI™, and fast-scanning imaging. The main benefits in using JPK AFM system are that (1) JPK is a company which provides a direct link to their development team. This enables more flexibility in our work, e.g. we often use non-conventional measurements which we can consult and even obtain some custom modifications; and (2) the open architecture design of the JPK operating system basically provides the user with the ability to customize nearly every parameter and perform measurements and experiments as required."

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The Rousso group have published a number of papers using the JPK NanoWizard® AFM to study the mechanical and morphological properties of HIV-1 capsids. These illustrate the NanoWizard®'s versatility, resolution and high performance imaging. [1-3]

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.

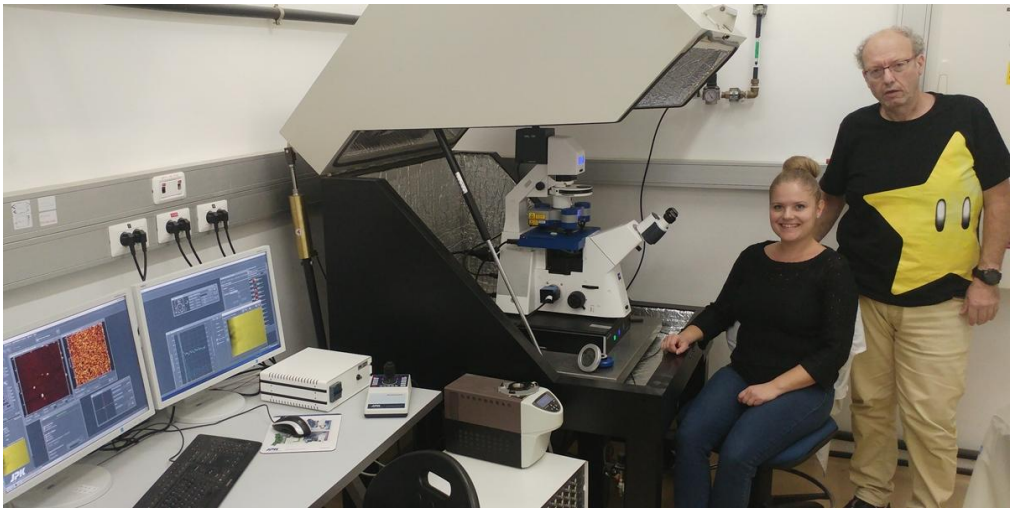
References

1 Lui et al, Cyclophilin A stabilizes the HIV-1 capsid through a novel non-canonical binding site, NATURE COMMUNICATIONS | 7:10714 | DOI: 10.1038/ncomms10714

2 Ramalho et al, Analysis of the mechanical properties of wild type and hyperstable mutants of the HIV-1 capsid, *Retrovirology (2016) 13:17* DOI 10.1186/s12977-016-0250-4

3 Rankovic et al, Reverse Transcription Mechanically Initiates HIV-1 Capsid Disassembly, J Virol 91:e00289-17. https://doi.org/10.1128/JVI.00289-17.

Attachment



Professor Itay Rousso and his PhD student, Sanela Rankovic, with their JPK NanoWizard® ULTRA Speed AFM system at Ben-Gurion University.

For a high resolution copy of the image, 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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