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JPK reports on the exciting research in the School of Medicine at Sungkyunkwan University (SKKU), Suwon, South Korea using the NanoWizard® ULTRA Speed AFM to understand the binding of transcription factor Sox2 with super enhancers.

Berlin, November 23rd 2017: JPK Instruments, a world-leading manufacturer of nanoanalytic instrumentation for research in life sciences and soft matter, reports on the exciting research of the Kim Group in the Structural Biology Laboratory of the Sungkyunkwan University School of Medicine, (SKKU), Suwon, South Korea using JPK's NanoWizard® ULTRA Speed AFM to study the binding of transcription factor Sox2 with super enhancers.

[Professor Kyeong Kyu Kim](#) leads a research group in the Structural Biology Laboratory of Sungkyunkwan University (SKKU) in Suwon, South Korea. The goal of their research is to understand the working mechanisms of Sox2, a master transcription factor that plays a role in controlling the “stemness” of cells. In this research, the Group focuses on how Sox2 accesses super enhancers and what happens to them when Sox2 binds to them. AFM (atomic force microscopy) is applied to investigate the binding of Sox2 on super enhancers. It is also used to observe the structural changes of super enhancers induced by the binding of Sox2. The AFM is used to analyze real-time structural changes of super enhancers induced by Sox2 to be able to reveal the mechanisms of Sox2-mediated transcriptional activation on super enhancers. The comprehensive understanding of Sox2 activity on super enhancers will contribute not only to understanding the role of Sox2 in dedifferentiation of iPSC (induced pluripotent stem cell) but also in enhancing the dedifferentiation efficiency by developing molecules that regulate the Sox2 activity.

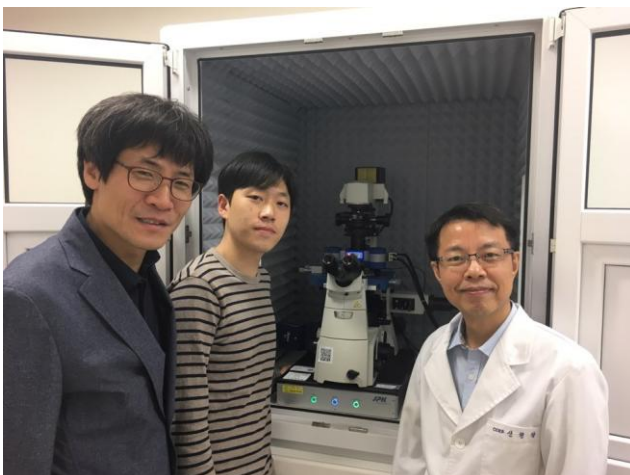
Professor Kim and a graduate student, Mr Wanki Yoo, talk about why AFM from JPK was chosen for their research: “To visualize the events occurring *in vitro* is very challenging. The virtue of AFM is that imaging can be performed in solution enabling the whole process to be carried out in solution keeping samples in native condition. Another advantage of using AFM is to monitor each step of the reaction serially while imaging; this provides us with a better understanding on each and every step. Furthermore, the fast scanning of the JPK NanoWizard® ULTRA Speed AFM provides real-time scanning for imaging while maintaining noise at minimum levels. This means using the AFM for our research will bring us the knowledge on the binding mode between Sox2 and super enhancers.”

There were specific features of the ULTRA Speed AFM that attracted Professor Kim to select it: "Rather than capturing one "scene" of the sample, we tried monitoring a chain of events between Sox2 and the super enhancers. Hence, the ability to obtain high resolution images quickly while minimizing the damage to the sample, keeping its structure in its native condition, was most crucial to our research. JPK's NanoWizard® ULTRA Speed AFM provides high resolution and also scans very fast; the recently installed 'Quantitative imaging mode' (QI™) adds to its advantage because it helps apply the smallest lateral damage to the sample by making force-distance plot for every pixel of samples. This gives us the best quality of images."

Continuing, Mr Yoo said "Compared to other SPM instruments, JPK's AFM has the advantage of being able to provide very high-resolution images. The most powerful and key benefit of the NanoWizard® system that sets it apart from all other SPM systems is that it does not require any treatments of the sample for the measurement. This is beneficial as treatments can potentially alter the result of the experiment. Such ability of the AFM allows the samples to be kept in their native condition."

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 YouTube: <http://www.youtube.com/jpkinstruments>.

Attachment



Professor Kyeong Kyu Kim with his graduate student, Mr Wanki Yoo, and lab manager, Dr Hyungchang Shin with their JPK NanoWizard® ULTRA Speed AFM at SKKU in Korea

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, 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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