Park SYSTEMS

Application Note

Mouse Sperm Cells

Excellent to Assess the Morphological Features of Sperm Cells

(a) (b) (c)

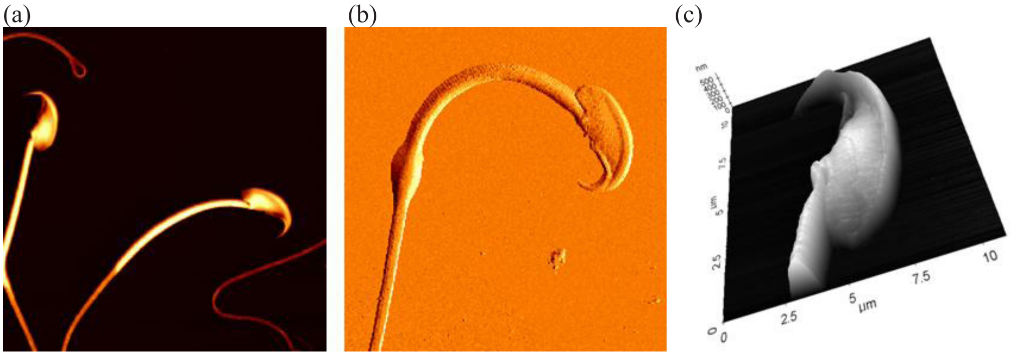

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Figure 1. High resolution AFM Images of mouse sperm cells. (a) Topography of sperms (45 µm scan size), (b) error image of sperm (25 µm scan size) and (c) 3D rendering of topography image of sperm head (11 µm scan size).

(a) (b) (c)

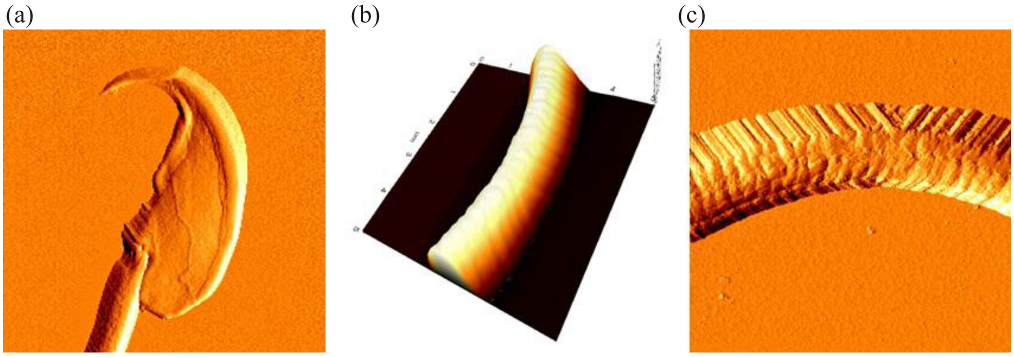

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Figure 2. High resolution AFM images of mouse sperm cells. (a) Error image of sperm head (11 µm scan size), (b) 3D rendering of topography image of sperm tail (5 µm scan size) and (c) error image of sperm tail (5 µm scan size).

Sperm morphology is assessed routinely as part of standard laboratory analysis in the diagnosis of human male infertility. It is well-known that the morphology of fertile sperm is significantly different from that of infertile sperm.

Optical microscopy has been used to observe the morphological features of sperm cells, but requires sample staining and offers only limited resolution.

In contrast, atomic force microscopy doesn't need any sample staining. Furthermore, it provides much higher resolution images than optical microscopy.

Figure 1 and 2 show high resolution AFM images of mouse sperm cells. Mouse sperm cells were extracted from the mouse testis tissue and fixed with 1% glutaraldehyde and 1% paraformaldehyde in phosphate buffered saline. Then, they were attached onto the poly-L-lysine coated glass slide and it was washed out with filtered distilled water twice.

The images were obtained using contact mode AFM in air. A gold-coated silicon nitride cantilever was used to image the sample. Its spring constant is approximately 0.06 N/m.

AFM images can be quantitatively analyzed using XEI software. The dimensions and features of sperm cell parts can be measured and evaluated with the strict criteria for sperm morphology.

The XE-series AFM is expected to become an excellent tool to assess the morphological features of sperm cells.

Park Systems Inc.
3040 Olcott St.
Santa Clara, CA 95054
Toll Free +1-866-979-9330
Phone +1-408-986-1110
Fax +1-408-986-1199
www.parkafm.com

Park Systems Japan Inc.
Nakamaya Bldg. 2F
2-9 Kanda Nishi-cho
Chiyoda-ku
Tokyo 101-0054, Japan
Phone +81-3-3219-1001
Fax +81-3-3219-1002
www.parkafm.co.jp

Park Systems Corp.
KANC 4F
Iui-dong, 906-10
Suwon, Korea 443-270
Phone +82-31-546-6800
Fax +82-31-546-6805
www.parkafm.co.kr