

新聞稿 PRESS RELEASE

To News Editor

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## **CUHK Scientist Solves a Four-decade Mystery of Sperm Maturation Novel Gene Found Responsible for Sperm Motility**

Sperm do not intrinsically possess the ability to swim or fertilize the egg when they are first produced by the testis, but acquire these abilities through a process called sperm maturation in the epididymis situated next to the testis. How sperm become mature in the epididymis remains a puzzle since up still now no gene of epididymis-origin that is involved in the process of sperm maturation has been found despite nearly four decades of search.

A recent study published by *Nature Cell Biology* that was conducted at the Epithelial Cell Biology Research Centre of The Chinese University of Hong Kong has revealed the first secret of sperm maturation, demonstrating that Bin1b, a  $\beta$ -defensin gene found in the head region of the epididymis can bind to sperm head and induce progressive sperm motility in originally immotile immature sperm.

Professor Chan Hsiao-Chang, director of the Research Centre, explains, progressive movement of sperm is one of the fundamental changes associated with early process of sperm maturation. Thus,  $\beta$ -defensin is the first molecule found in the epididymis that is involved in the initiation of sperm maturation. It could be used as a biomarker for diagnosis of male infertility or for treatment and may lead to new research in this area. The findings also provide grounds for development of new contraceptive strategies. Studies on the detailed mechanisms how Bin1b interacts with sperm membrane proteins are already in the pipelines and plans to examine Bin1b expression in infertile patients are also in place. Some of the planned studies have received support from Lalor Foundation in USA.

The investigation of the role of the novel epididymis-specific gene, Bin1b is a collaborative project of the Centre with the Shanghai Institute of Biochemistry and Cell

Biology, Chinese Academy of Sciences. Previous work on Bin1b for its antimicrobial activity was published in *Science* in 2001. Together with the previous findings, the present results suggest that Bin1b plays dual role in the epididymis, both as a defensin and a regulator of sperm maturation.

The Epithelial Cell Biology Research Centre, established as a joint effort of the Academy of Military Medical Sciences and CUHK, is the first integrated research institution ever founded in China which is devoted to epithelial cell biology research. The epithelium is a continuous layer of cells that covers external body surface and forms lining of body cavities and exocrine glands. Disturbance of epithelial cell functions give rise to a wide spectrum of common disorders such as diarrhoea and lethal diseases including cancers. Reproductive biology with focus on the role of reproductive tract epithelia in spermatogenesis & sperm maturation, fertilization and implantation is one of the major research directions of the Centre.