

## Effect of Androgen on the Expression of Aquaporins in Mouse Epididymis

Jae Eun Lee, Myung Chan Gye

한양대학교 생명과학과

**Objectives:** Aquaporins (AQPs) are transmembrane channel proteins, and function as molecular water channel in the direction of osmotic gradients. Alterations in the fluid homeostasis in epididymis may affect male infertility. In an effort to uncover the functional involvement of AQPs in sperm maturation, expression of AQP-1, -4, -7, -8, and -9 was investigated together with the effect of testosterone on the AQPs expression in different regions in mouse epididymis.

**Methods:** Adult male mice were subjected to ORX. After recovery, to allow clearance of circulating androgen following ORX or sham, mice were rested for two weeks, and then subjected to subcutaneous injections of 5 $\alpha$ -dihydrotestosterone (DHT) at 3 mg/kg (for 7 days) dissolved in sesame oil (n = 5 for each treatment). Immunohistochemical localization of Hox proteins in caput, corpus, and cauda epididymis was conducted together with optimized RT-PCR analysis of AQP mRNA in epididymis.

**Results:** AQP-1, -4, -7, -8, and -9 were detected in all three regions of epididymis. AQP-1 mRNA level was a little lower in corpus epididymis compared with other regions. Conversely, AQP-7 and -8 mRNA level was significantly higher in corpus epididymis compared with other regions. AQP-9 mRNA level was increased along the length of the epididymis. Following exposure to 5 $\alpha$ -DHT(3 mg/kg), AQP-9 mRNA level increased a little in caput epididymis. In corpus epididymis, AQP-8 and -9 mRNA level increased by 5 $\alpha$ -DHT.

**Conclusion:** Expression of AQPs was different according to the segment of mouse epididymis. Epididymal expression of AQP-9 affected 5 $\alpha$ -dihydrotestosterone, suggesting that 5 $\alpha$ -dihydrotestosterone may regulate fluid homeostasis in epididymis and thus sperm maturation in epididymis.