

The epididymis is the primary site for sperm maturation and storage. Fully differentiated testicular sperm reside in convoluted epididymal tubule, constantly interacting with the epididymal epithelium and their secretions. Epididymal secretions contain a large pool of proteins and molecules that can modify the sperm membrane surface. Quiescin Q6 sulfhydryl oxidase 2 (QSOX2), an epididymal- and seminal vesicle-enriched secretory protein, catalyzes the oxidation of thiol group into stable disulfide bonds. This enzyme affects protein folding and modifies the compositions of the extracellular matrix. Detailed analysis of QSOX2 function indicates that it participates in the pre-ejaculate selection of sperm cells by regulating sperm aggregation and tyrosine phosphorylation.

The proximity of this enzyme to the epididymal lumen, and hence the maturing sperm, can be seen in the epididymal cross section shown: QSOX2 (red) is aggregated in vesicle-like structures at the apical ridge of the epithelium, whose boundaries are indicated by lateral E-cadherin (green). Nuclear staining (blue) shows the polarized nature of the epididymal epithelium as well as the sperm residing in the lumen.

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