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Sonic Hedgehog Pathway Genes Are Expressed and Transcribed in the Adult Mouse Epididymis

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One role of the hedgehog (hh) signaling pathway during development is to assist in establishing pattern orientation in the embryo. The structure and function in the adult epididymis is highly patterned, and since the sonic hedgehog (Shh) pathway is known to be functional in the developing male tract and the expression of other pattern-influencing genes has recently been found in the adult epididymis, we have examined the adult mouse epididymis for Shh pathway molecules. Examination was at both the gene and protein level. Shh, the secreted signal molecule, patched (Ptc), its membrane receptor, and Gli-1, a downstream transcription factor, were detected at the gene level with semiquantitative reverse transcriptase-polymerase chain reaction (RT-PCR) and at the protein level with Western blot analysis. Immunohistochemical localization further detected Shh specifically in the epididymal epithelium. It was hypothesized that efferent duct ligation (EDL) would alter epididymal segmentation within 30 days of the ligation, especially in the proximal segments of the caput epididymis. It was further hypothesized that these alterations would be correlated with changes in the expression of genes in the Shh pathway. EDL did not alter epididymal segmentation, but Shh, Ptc, and Gli1 expression was significantly altered at specific times after the ligation. The presence of the signaling pathway in the adult epididymis is a novel finding, as is the fact that in the distal epididymis, the specific gene expressions are altered by EDL. This suggests that the genes are capable of being regulated in a manner that is influenced by testicular contribution, and it implies that those genes have a function in the epididymis subject to that regulation.

Key words: Gene transcription, efferent duct ligation

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