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Isolated Rat Epididymal Basal Cells Share Common Properties with Adult Stem Cells¹

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Abstract

There is little information on the function of epididymal basal cells. These cells secrete prostaglandins, can metabolize radical oxygen species, and have apical projections that are components of the blood-epididymis barrier. The objective of this study was to develop a reproducible protocol to isolate rat epididymal basal cells and to characterize their function by gene expression profiling. Integrin- $\alpha 6$ was used to isolate a highly purified population of basal cells. Microarray analysis indicated that expression levels of 552 genes were enriched in basal cells relative to other cell types. Among these genes, 45 were expressed at levels of 5-fold or greater. These highly expressed genes coded for proteins implicated in cell adhesion, cytoskeletal function, ion transport, cellular signaling, and epidermal function, and included proteases and antiproteases, signal transduction, and transcription factors. Several highly expressed genes have been reported in adult stem cells, suggesting that basal cells may represent an epididymal stem cell population. A basal cell culture was established that showed that these basal cells can differentiate in vitro from keratin (KRT) 5-positive cells to cells that express KRT8 and connexin 26, a marker of columnar cells. These data provide novel information on epididymal basal cell gene expression and suggest that these cells can act as adult stem cells.