

Sca-1 Expression Identifies a Progenitor/Stem Cell Population in the Proximal Region of Murine Prostatic Ducts With a High Capacity to Reconstitute Prostatic Tissue

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We previously showed that prostatic stem cells are concentrated in the proximal regions of prostatic ducts. We now report that these stem cells can be purified from isolated proximal duct regions by virtue of their high expression of the Sca-1 surface antigen. In an *in vivo* prostate reconstitution assay, the purified Sca-1 expressing cell population isolated from the proximal region of ducts was much more effective in generating prostatic tissue than a comparable population of Sca-1 depleted cells (203.0 ± 83.1 mg vs. 11.9 ± 9.2 mg) or a population of Sca-1 expressing cells isolated from the remaining regions of ducts (transit-amplifying cells) (31.9 ± 24.1 mg). Almost all of the proliferative capacity of the proximal duct Sca-1 expressing cell population resides within the fraction of cells that express high levels of Sca-1 (top 1/3) with the proximal region of prostatic ducts containing 7.2 fold more Sca-1^{high} cells than the remaining regions. More than 60% of the high expressing cells co-express $\alpha 6$ integrin and the anti-apoptotic factor Bcl-2, markers which are also characteristic of stem cells of other origins. As cancers may arise from mutations in stem cells and as benign prostatic hyperplasia may result from aberrant proliferation of these cells, the identification of the stem cell phenotype of prostate cells may permit the development of rational targeted therapies for treating both conditions.