Prostate cancer stem cells: from theory to practice.

Adamowicz J, Pakravan K, Bakhshinejad B, Drewa T, Babashah S.

Abstract

None of the generally accepted theories on prostate cancer development can fully explain many distinguishing features of the disease, such as intratumoral heterogeneity, metastatic growth, drug resistance and tumor relapse. Prostate stem cells are a heterogeneous and small subpopulation of self-renewing cells which can actively proliferate in response to changes in the androgen level and give rise to all the cell lineages that build the prostate epithelium. According to the cancer stem cell hypothesis, prostate cancer could be a stem cell disease. Prostate cancer stem cells, which represent only a minimal percentage of the tumor mass, are characterized by a markedly increased clonogenicity and therapeutic resistance. These tumor-initiating cells reside in dynamic niches distributed within the prostate but at a higher concentration in proximal regions of the prostatic ducts. Several markers have been used to identify prostate cancer stem cells. Nevertheless, a definitive profile has not yet been established owing to specificity issues. As cancer stem cells play determining roles in the birth and burst of prostate malignancy, strategies that selectively target them have gained huge clinical attention. Unraveling the mechanisms underlying the physiological functions of cancer stem cells and gaining fundamental insights into their putative involvement in the pathogenesis of prostate tumors provide novel opportunities for the development of efficient and sophisticated therapeutic strategies in the future.

KEYWORDS: Androgen; cancer stem cell; prostate cancer; prostate epithelium; stem cell marker

PMID: 28635565 DOI: 10.1080/21681805.2017.1283360