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Stem cells in the human prostate and animal models

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Prostate cancer is the second most frequent cancer among males worldwide, and most patients with metastatic spread develop therapy resistant disease. Recent research has suggested the existence of cancer stem-like cells, and that such cells may be the culprit behind therapy resistance and progression. We have taken advantage of the relative quiescent nature of stem cells to identify slow cycling label retaining stem cell populations of the prostate gland. In mice pulsed with BrdU during prostate organogenesis, the slow cycling label retaining stem cell populations of the prostate could be identified and characterized in week old and adult animals using immunohistochemistry and immunofluorescence. We identified label retaining cells in both the basal and epithelial cell layers of the prostate, which expressed several candidate stem cell markers in a lobe and duct/acini specific manner, including the SC markers Sca-1, TROP-2, c-kit, CD44, and the novel prostate SC marker cytokeratin-7. We found that 1.5% of the epithelial cells retained BrdU, and that the majority of label retaining cells (84.4%) were located in the basal cell layer of the epithelium. Importantly, a significant (15.6%) proportion of label retaining cells were localized in the luminal cell layer, the majority expressing androgen receptor. Our results suggest that there are separate basal and luminal SC populations, and open up for the possibility that androgen receptor expressing luminal stem-like cells could function as cancer-initiating cells in prostate cancer.

Biography

Jens Ceder completed his PhD at Lund University in 2008, and has Postdoctoral studies from Radboud University, Nijmegen, The Netherlands, and University of York, York, United Kingdom. In 2012, He was awarded the European Association of Urology Research Foundation (EAU-RF) Career Development Programme for Research Scientist, a three year funding start up program. He is now leading a team under the EAU-RF banner in collaboration with European researchers to identify prostate stem cells.

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