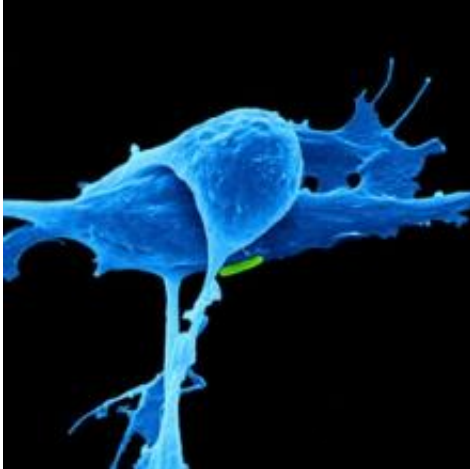


How prostate cancer cells evolve

December 4 2013, by Shaun Mason



(Medical Xpress)—UCLA researchers have discovered how prostate cancer stem cells evolve as the disease progresses, a finding that could help point the way to more highly targeted therapies.

Following recent studies showing that [prostate cancer](#) originates in basal [stem cells](#), UCLA researchers were surprised to discover that the cancer eventually begins to grow from a different type of cell called a luminal stem cell. The new discovery indicates that the basal stem cells evolve into luminal stem cells as the cancer grows. Existing prostate cancer drugs are designed to seek out and kill the basal stem cells that give rise to the cancer, so the evolution from basal to luminal stem cells creates a "moving target" that renders the drugs less effective over time.

The study, by Andrew Goldstein, Dr. Owen Witte, Tanya Stoyanova and colleagues from UCLA's Eli and Edythe Broad Center of Regenerative Medicine and Stem Cell Research and UCLA's Jonsson Comprehensive Cancer Center, was published online by the *Proceedings of the National Academy of Sciences* and will appear later in the journal's print edition.

Adult stem cells are tissue-specific cells that regenerate and replace diseased or damaged cells in the body's organs. Cancer starts in basal stem cells in the lining of the prostate gland, the epithelium, and they lose their ability to control their growth. Tumors that start as uncontrolled growth in basal stem cells continue to grow from luminal stem cells, another type of cell in the prostate epithelium.

"People have begun to think about cancers as being driven by stem cells in the same way that many of our adult organs are maintained by dedicated stem cells," Goldstein said. "Based on this new understanding, we are excited about going right to the root of the tumor and targeting those stem cells to eradicate the cancer."

Patients with aggressive prostate cancer are often treated with anti-androgens, drugs that block production of hormones such as testosterone that make the cancer more aggressive. The tumor stem cells that remain after the anti-androgen treatment look different from the basal and luminal cells. This means that for treatments that target specific cell types, researchers need to identify the different cell types that evolve as the disease and its treatment progress.

With the knowledge that prostate [cancer stem cells](#) can change their physical appearance, or phenotype, from one type of cell to another, the UCLA researchers are now seeking to understand whether certain elements of the stem cells remain consistent even as they evolve from one cell type to another. This knowledge could help scientists develop drugs that target the evolving cancer stem cells by aiming for the

elements that remain unchanged.

More information: "Prostate cancer originating in basal cells progresses to adenocarcinoma propagated by luminal-like cells." Tanya Stoyanova, Aaron R. Cooper, Justin M. Drake, Xian Li, Andrew J. Armstrong, Kenneth J. Pienta, Hong Zhang, Donald B. Koh, Jiaoti Huang, Owen N. Witte, and Andrew S. Goldstein. *PNAS* November 26, 2013. [DOI: 10.1073/pnas.1320565110](https://doi.org/10.1073/pnas.1320565110)

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