

New type of adult stem cells found in the prostate may be involved in prostate cancer development

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A new type of stem cell discovered in the prostate of adult mice can be a source of prostate cancer, according to a new study by researchers at the Herbert Irving Comprehensive Cancer Center at Columbia University Medical Center and New York-Presbyterian Hospital.

Led by Michael Shen, Ph.D., professor of medicine and genetics and development at Columbia University Medical Center, the researchers found the rare stem cells, called CARNs (which stands for "castration-resistant Nkx3.1-expressing cells"), within the ducts inside the mouse [prostate](#). The stem cells are involved in regenerating prostate tissue, but the researchers also found that CARNs can give rise to cancer if certain tumor suppressor genes in the cells are inactivated.

The findings will be published in an advance online edition of *Nature* on Wednesday, September 9, 2009.

Understanding which cells in the prostate give rise to cancer may help researchers develop better treatments for prostate cancer. But the identity of these cells of origin for prostate cancer has been controversial.

Recently, some researchers have proposed that prostate cancer may arise from normal [adult stem cells](#), since stem and cancer cells share several characteristics. But the only stem cells previously described in the

prostate are basal cells, which have been considered to form a "support" layer for the luminal cells that make prostate secretions. However, since prostate cancers are filled exclusively with cells that have features of luminal cells, it has been unclear how cancer might arise from basal cells.

The new study may resolve this conundrum because the newly discovered adult stem cells are also luminal cells. "Previous research suggested that prostate cancer originates from basal stem cells, and that during cancer formation these cells differentiate into luminal cells," said Dr. Shen. "Instead, CARNs may represent a luminal origin for [prostate cancer](#)."

And indeed, the researchers found that CARNs in mice can give rise to prostate cancers, after the cells lose the activity of PTEN, a gene that is frequently mutated in human prostate cancers.

The results do not mean, however, that CARNs give rise to "cancer stem cells," cells inside a tumor that are capable of regenerating the cancer from a single cell. "The relationship between the normal prostate stem cells and potential cancer stem cells is not known yet," said Dr. Shen. "And even the existence of [cancer stem cells](#) in prostate tumors is not established."

Also unclear is whether CARNs exist in the normal human prostate and if human prostate cancers originate from these CARNs. Dr. Shen's lab is now looking to investigate these issues.

Source: Columbia University Medical Center ([news](#) : [web](#))

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