

Breaking Advances

Highlight from recent cancer literature

Two cellular lineages are identified to initiate prostate cancer

Identifying the cells of origin for prostate cancer is a key step to improve disease prevention and therapeutics. However, the identity of these cells has been long debated and remains inadequately defined because of a lack of proper animal models. Now, recent findings by Xin and colleagues provide new insight on the origins of prostate cancer. Their report, published in *Cancer Cell*, shows that prostate cancer can initiate from both basal and luminal cell lineages and that deregulation of epithelial differentiation is a critical step for initiation of prostate cancer of basal cell origin.

In their study, Xin and colleagues used a lineage tracing approach and show that adult rodent prostate basal and luminal cells are self-sustained *in vivo* and *in situ*, “which is in contrast to the current prevailing model in which a multipotent stem cell population is responsible for the maintenance of prostate epithelial tissue,” explains Xin. They also indicated that disease initiation from prostate basal cells would not happen without oncogenic-signal-induced differentiation of adult prostate

basal cells into luminal cells. Therefore, human prostate cancer with a basal cell origin may be initiated through deregulation of normal differentiation of the prostate epithelium.

In addition, they determined that prostate cancer might be initiated in either lineage by disrupting the tumor suppressor Pten *in vivo*. However, the initiated tumors have distinctive cellular composition and onset dynamics: prostate luminal cells are more responsive to Pten null-induced mitogenic signaling, whereas the capability of basal cells to differentiate into transformation-competent luminal cells is induced by loss of Pten activity.

Going forward, Xin says, “It will be interesting to determine whether the cancerous tissues derived from basal and luminal cells are different in terms of their malignant potential.”

—By Ke-Jian Gan

Original featured article:

Choi N, Zhang B, Zhang L, et al. Adult murine prostate basal and luminal cells are self-sustained lineages that can both serve as targets for prostate cancer initiation. *Cancer Cell*, 2012,21:253–265.

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