Tumor-initiating Cells Detected in Pten Null Prostate Cancer Model

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(PhysOrg.com) -- New findings published in *Cancer Research*, a journal of the American Association for Cancer Research, advance the current understanding of the role of stem/progenitor cells on the initiation and progression of prostate cancer from the Pten null prostate cancer model.

“Conventional therapy has focused on treating the entire tumor. However, if cancer stem cells are the source of cancer initiation, progression and resistance to therapies, then targeting of these cells may prove more effective in treatment of the lethal phenotype of prostate cancer, termed castrate-resistant disease,” said researcher David J. Mulholland, Ph.D., postdoctoral fellow in the laboratory of Hong Wu, M.D., Ph.D., at the University of California, Los Angeles.

Mulholland, Wu, who is professor of the Institute for Molecular Medicine and Molecular and Medicinal Pharmacology and a researcher at the UCLA’s Jonsson Comprehensive Cancer Center, and colleagues evaluated whether a subpopulation of stem/progenitor cells - Lin-Sca-1+CD49f^{high} cells (LSC) - isolated from the Pten null prostate cancer model could initiate tumorgenesis.

After evaluating results from the complementary in vitro and in vivo reconstitution assays, the researchers found that sorted LSC cells retrieved from Pten null spheres or the primary tumors regenerated the cancerous prostate epithelial structure, mimicking the organization of the tumor. The study was conducted in a mouse model.

These results are consistent with, and support the concept that the LSC subpopulation carries tumor-initiating activity. While results from previous studies showed that LSC cells exhibit a stem/progenitor phenotype, the results of this study demonstrate a functional significance of these cells in the etiology of prostate cancer, according to Donald J. Tindall, Ph.D., editorial board member of Cancer Research.

“The significance of these findings is the demonstration that a subpopulation of prostate cells from Pten null mice has the capability of prostate cancer initiation and progression,” said Tindall, professor, director and vice chair of urologic research, and the Carl Rosen professorship in urology in the Departments of Urology and Biochemistry Molecular Biology at the Mayo Clinic College of Medicine.

Wu and colleagues are conducting further studies using drug therapy to target the LSC subpopulation in hopes of achieving greater therapeutic efficacy. Tindall suggested that additional studies are needed to more completely characterize these cells, particularly their role in prostate cancer progression following androgen depletion.

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