Derivation Of A Human Neuroendocrine Prostate Cancer Cell Line With Defined Oncogenic Drivers

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SUMMARY

Researchers at UCLA have developed a malignant neuroendocrine prostate cancer cell line that was derived from benign human prostate tissue and transformed with the oncogenes MYCN and myristoylated AKT1.

BACKGROUND

Human cell lines are an important component to laboratory research. Currently there are only two available human neuroendocrine prostate cancer cell lines, both of which are derived from patients with metastatic prostate cancer. While it is important to understand cancer phenotypes of disease-derived cell lines, it is possible that models obtained from cancer patients have undergone additional mutations or changes that could mask behaviors that stem from specific genetic mutations. In contrast, a model with defined genetic alterations makes it possible to address cancer cell behaviors that result from these well-known mutations. Therefore, a cell line derived from normal tissue with precise genetic alterations of known oncogenes would greatly assist researchers in their goals to obtain a greater understanding of neuroendocrine prostate cancer and to develop new, more effective treatments.

INNOVATION

Drs. Witte and Lee at UCLA have developed the LASCPC-1 cell line, a malignant neuroendocrine prostate cancer cell line that was derived from benign human prostate tissue and transformed with the oncogenes MYCN and myristoylated AKT1. The technology is unique in that it is a human neuroendocrine prostate cancer cell line driven by defined cancer genes. While the available PC3 and NCI-H660 neuroendocrine prostate cancer cell lines were initiated from diseased tissues from patients with metastatic prostate cancer, LASCPC-1 was derived from a genetically engineered human model in which benign human prostate tissue was isolated, malignantly transformed with the oncogenes MYCN and activated AKT1 using lentiviruses, then propagated as a xenograft tumor. The vectors were designed to have coexpression of RFP and GFP for the MYCN and AKT1 genes, respectively, to give researchers the ability to easily verify that cells are still expressing the incorporated oncogenes. The inventors have confirmed the neuroendocrine phenotype of the LASCPC-1 cell line by demonstrating protein expression of the neuroendocrine markers NSE, FOXA2, NCAM1, and ASCL1.

APPLICATIONS

- Experimental testing in research laboratories

ADVANTAGES

- The LASCPC-1 cell line is one of only three human prostate cancer cell lines (including PC3 and NCI-H660) that are representative of neuroendocrine prostate cancer.
- LASCPC-1 cell line is driven by high levels of expression of the N-Myc oncoprotein.
- MYCN overexpression and amplification defines a subset of neuroendocrine prostate cancers. However, none of the commercially available prostate cancer cell lines demonstrate appreciable N-Myc expression at the protein level.
- Cells express fluorescent protein markers that verify the expression of MYCN and myristoylated AKT1.
- The cell line uses commercially available media formulas.

STATE OF DEVELOPMENT

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INVENTORS

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OTHER INFORMATION

KEYWORDS

cell line, neuroendocrine prostate cancer, N-Myc, MYCN, AKT1, RAC-alpha serine/threonine-protein kinase, malignant transformation

CATEGORIZED AS

- **Medical**
  - Research Tools
- **Research Tools**
  - Cell Lines

RELATED CASES

2015-288-0

- Developed and validated
- LASCPC-1 was derived from a genetically engineered human model in which benign human prostate tissue was isolated, malignantly transformed with the oncogenes MYCN and activated AKT1, and propagated as a xenograft tumor.
- The cell line has been confirmed to be of neuroendocrine phenotype by demonstrating protein expression of the neuroendocrine markers NSE, FOXA2, NCAM1, and ASCL1.
- Cell line xenograft tumors demonstrate mixed neuroendocrine prostate cancer and prostate adenocarcinoma

RELATED MATERIALS

- Lee JK et al. N-Myc Drives Neuroendocrine Prostate Cancer Initiated from Human Prostate Epithelial Cells. Cancer Cell. 2016 Apr 11;29(4):536-47.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Nucleic Acid Tetramers For High Efficiency Multiplexed Cell Sorting
- Mouse Model Deficient for the Proton Sensing Gpcr T-cell Death-associated Gene 8 (tdag)
- Surfaceome Profiling Of Advanced Prostate Cancer To Identify Target Antigens For Immune-Based Therapy
- Anti-Human Deoxycytidine Kinase (dCK) Monoclonal Antibody
- Novel Non-Immunogenic Positron Emission Tomography Gene Reporter
- Targeted Mass Spectrometry Approaches To Detect Kinase Pathways For Personalized Medicine
- G2A GPCR Deficient Mouse Model and G2A Monoclonal Antibody
- Proton-sensing G Protein-coupled Receptor 4 Knockout
- Novel Polyclonal Antibody to Detect a Bruton's Tyrosine Kinase Phosphorylation Site
- Non-Immunogenic Positron Emission Tomography Gene Reporter Systems

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