Genetically Engineered Mice Lacking a Tumor Suppressor Gene in the CNS

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BACKGROUND

Mutation in the PTEN tumor suppressor gene is associated with several human cancers and neurological abnormalities, such as enlarged brain (megacephaly), mental retardation, and malignant brain tumors. Inactivation of PTEN in mouse models confirmed PTEN to be a bona fide tumor suppressor. However, since a null mutation of the gene leads to death during embryogenesis, there hasnt been a defined *in vivo* model for studying the exact functions of PTEN in brain development and tumor formation.

INNOVATION

To overcome the early embryonic lethal phenotype in PTEN(-/-) mice and to study the roles of PTEN in embryonic development, adult tissue function, and tumorigenesis, researchers at UCLA have generated a knockout mouse model with the PTEN gene functionally deleted in neural stem cells. The mouse model can be used in the following applications: **1)** preclinical screening for compounds with activities that target the PTEN-controlled signaling pathways in treating cancer and other neurological abnormalities; **2)** stemcell research for understanding how PTEN is involved in neural stem cell development, neural regeneration, and neuronal differentiation.

RELATED MATERIALS

- Negative regulation of neural stem/progenitor cell proliferation by the Pten tumor suppressor gene in vivo. *Science.* (2001)
- Cre/loxP-Mediated Inactivation for the Murine Pten Tumor Suppressor Gene. *Genesis.* (2002)

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- PTEN Null Cell Lines
- Adipose Tissue-specific PTEN Knockout Mice
- Murine PTEN Null Prostate Cancer Model
- A Method for In Vivo Visualization of Mutated Mouse Cells

CONTACT

UCLA Technology Development Group
ncd@tdg.ucla.edu
tel: 310.794.0558.

INVENTORS

- Wu, Hong

OTHER INFORMATION

KEYWORDS

research tools, mouse models, cancer, CNS, neurology

CATEGORIZED AS

- **Research Tools**
  - Animal Models

RELATED CASES

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UCLA Technology Development Group
10889 Wilshire Blvd., Suite 920,Los Angeles,CA 90095
https://tdg.ucla.edu
Tel: 310.794.0558 | Fax: 310.794.0638 | ncd@tdg.ucla.edu