B-raf/loxp-flanked Mutant Mouse

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BACKGROUND

B-raf is a member of the Raf family of intracellular signaling proteins, which also include Raf-1 and A-raf. Members of this family are involved in the all-important cellular signaling mechanism known as the Ras/Raf/MEK/ERK/MAPK signaling pathway. This ubiquitous pathway relays signals from outside the cell into the cells nucleus, regulating activities such as gene expression, differentiation, cell division, cell survival and cell death. B-raf regulates vital functions in the brain, testes, skin and bone marrow, and mutations in B-raf are found in malignant melanoma, certain types of thyroid and ovarian cancers, and sporadic types of colon cancers. Up to 6% of all human malignancies may harbor this mutation. Most recently, Sorafenib (Nexavar), which inhibits raf as well as a whole host of other signaling proteins, has been approved by the FDA for the treatment of advanced cancer of the kidney (clear-cell renal cell carcinoma).

INNOVATION

UCLA researchers have made a B-raf/loxP-flanked transgenic mouse. Flanking the B-raf gene with the loxP sequence allows targeted excision of the B-raf gene only when the cell expresses the protein Cre. This allows selective deletion of B-raf in a cell or tissue-specific manner and in a time or developmentally-specific manner as well.

APPLICATIONS

- Cancer research involving the Ras/Raf/MEK/ERK/MAPK signaling pathways
- Research into learning and memory, and hematopoiesis and myelopoiesis

ADVANTAGES

- Uses proven Cre/LoxP DNA recombination technology for targeted gene excision
- Unlike knockout mutants with global B-raf deficiency, B-raf/loxP sequence allows deletion of the B-raf gene in a cell or tissue-specific manner
- Unlike knockout mutants, B-raf/loxP sequence allows deletion of the B-raf gene in a time or developmentally-specific manner, such as after tumorigenesis or transformation
- Allows functional testing in specific cell types without the confounding effects of deleting B-raf in unknown or unrelated cells and tissues

RELATED MATERIALS

- Forebrain-specific knockout of B-raf kinase leads to deficits in hippocampal long-term potentiation, learning, and memory. *J Neurosci Res.* 2006

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Inducible Dominant Negative Disc1 Transgenic Mice as a Model for Schizophrenia
- Phospho-specific Antibody for Cam Kinase II
- Statins as Treatment for Cognitive Dysfunction Associated with RASopathies

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OTHER INFORMATION

KEYWORDS

research tools therapeutics, mouse model, mice, ERK, cancer, conditional, hematopoiesis, myelopoiesis, learning and memory

CATEGORIZED AS

- **Research Tools**
  - Animal Models

RELATED CASES

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