

Non-Confidential Description - PSU No. 3668
“CYLD Knockout Mouse”

Keywords/Field of Invention:

Cylindromatosis (CYLD), Ubiquitination, Tumor Suppression, Animal Model for Cancer Research

Inventors:

Shao-Cong Sun, William Reiley, Ming-Ying Zhang

Background

The discovery of Cylindromatosis (CYLD) as a tumor suppressor in 2000 initiated the elucidation of the anti-tumor and physiological functions of this deubiquitinase (DUB) and its signaling action in molecular mechanisms. CYLD knockout mice have been instrumental in proving CYLD's physiological functions, its tumor suppressor activity, its important role in the regulation of immune and inflammatory responses and apoptosis. The human CYLD gene mutations have been implicated in the following cancers; multiple familial trichoepithelioma, familial cylindromatosis, multiple myeloma, hepatocellular carcinoma, uterine cervix carcinoma and kidney cancer.

Invention Description

The tumor-suppressing function of CYLD has been studied using mouse models. CYLD knockout mice do not spontaneously develop tumors, but they are more sensitive to chemically induced skin tumors than wild-type mice. The loss of CYLD promotes tumor cell proliferation. For instance, a study has also demonstrated that CYLD knockout mice are also more susceptible to colon tumor induction by dextran sulfate sodium.

The critical role of CYLD in NF- κ B regulation suggests the involvement of this DUB in other biological processes, including 1) immune response and inflammation such as inflammatory bowel disease and colonic inflammation – a risk factor for colorectal cancer, 2) germ cell apoptosis and spermatogenesis, 3) osteoclastogenesis and bone homeostasis, 4) cell cycle progression and cell migration and 5) Human Papillomavirus-mediated malignancies, including cervical, head and neck cancers. Recent research focused on the Notch-induced NF- κ B activation using animal models, including the CYLD knockout mice, supports its utility in leukemia research and T-ALL clinical trials.

Status of the Invention

The inventors have made a breeding colony of CYLD heterozygous knockout mouse, which have been studied for nearly a decade by a number of academic and corporate researchers. The principal inventor is capable of supplying breeding pairs of mice to corporate laboratories under a standardized fee-bearing, non-exclusive license and materials bailment agreement.

Commercial Applications

The CYLD heterozygous knockout mouse has utility as a research tool.

Contact: Lidia Sobkow, Ph.D.
Technology Licensing Officer
The Pennsylvania State University

Phone: (814) 865-6277
Direct: (814) 863-6336
Fax: (814) 865-3591
E-mail: iks5393@psu.edu