Docket #: S06-327

Pbx1 knockout mice - (B6.129S-Pbx1tm3.1Mlc/J)

Researchers in the laboratory of Michael Cleary at Stanford University have developed a mouse that lacks the transcription factor Pbx1. Pbx1 is a proto-oncogene that was originally discovered at the site of chromosomal translocations in pediatric acute leukemia. It encodes a TALE (three amino acid loop extension) class homeodomain transcription factor. This protein is a component of complexes that regulate gene expression. Lack of Pbx1 results in embryonic lethality and is associated with multiple patterning malformations, hypoplasia or aplasia of most internal organs, organ malfunctions, and severe fetal anemia. In addition to cancer, Pbx1 appears to play a significant role in bone formation and pancreatic function.

Ongoing Research:
The inventors continue to characterize the Pbx1 knock-out phenotype and its impact on development of various organ systems.

Applications

- **Research** - on embryonic development and tissue homeostasis

Advantages

- ***In vivo* vertebrate model**

Publications

- Selleri L, Depew MJ, Jacobs Y, Chanda SK, Tsang KY, Cheah KS, Rubenstein JL, O'Gorman S, Cleary ML., "Requirement for Pbx1 in skeletal patterning and

programming chondrocyte proliferation and differentiation." *Development*. 2001 Sep;128(18):3543-57.
- DiMartino, J., Selleri, L, Traver, D., Firpo, M., Rhee, J. W., Warnke, R., O'Gorman, S., Weissman, I.L., and Cleary, M.L. 2001. "The Hox cofactor and proto-oncogene Pbx1 is required for maintenance of definitive hematopoiesis in the fetal liver." *Blood* 98:618-626.
- Kim, S.K., Selleri, L., Lee, J. S., Zhang, A.Y., Gu, X., Jacobs, Y., and Cleary, M.L. 2002. "Pbx1 inactivation disrupts pancreas development and in Ipf1-deficient mice promotes diabetes mellitus." *Nature Genetics* 30:430-435.
- Schnabel, C.A., Selleri, L. and Cleary, M.L. 2003. "Defects in adrenal development and urogenital differentiation in Pbx1 deficient mice." *Genesis* 37:123-130.
- Manley, N.R., Selleri, L., Brendolan, A., Gordon, J., and Cleary, M.L. 2004. "Abnormalities of caudal pharyngeal pouch development in Pbx1 knockout mice mimic loss of Hox3 paralogs." *Dev. Bio.* 276:301-312.

Innovators

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