TRM: Cyclic Nucleotide-Gated Potassium Channel 4 (HCN4)nLacZ/H2BGFP Mice

Tech ID: 30493 / UC Case 2008-128-0

BACKGROUND

The hyperpolarization activated nucleotide gated cation channel HCN4 is a pacemaker channel that is highly expressed in the sinoatrial node during development and in the adult. To better facilitate visualization of HCN4 expression, we generated mice with a nuclear localized (n) LacZ or H2BGFP knocked into the endogenous HCN4 locus and analyzed reporter expression in the heart during development.

TECHNOLOGY DESCRIPTION

Heterozygous mice are viable and fertile, homozygotes are embryonic lethal. The HCN4nLacZ/H2BGFP allele expresses a floxed nuclear lacZ and a H2BGFP fusion protein from the hyperpolarization-activated, cyclic nucleotide-gated K+ 4 (*HCN4*) promoter/enhancer elements. The *frt*-flanked neo is still present in this strain. HCN4 is expressed in the first heart field of differentiating myocytes in the developing cardiac crescent. These mice express in the first heart field of the cardiac conduction system (CCS). When these mice are bred to mice that express Cre recombinase, resulting offspring will have the floxed-lacZ sequence removed, resulting in EGFP fluorescence in the CCS.

APPLICATIONS

These mice are useful for visualizing cells in the first heart field of the developing cardiac crescent.

STATE OF DEVELOPMENT

The mice are designated Tangible Research Material (TRM). A complete description, including genotyping, phenotyping, etc is found at The Jackson Lab cat. No. 024284 https://www.jax.org/strain/024284

INTELLECTUAL PROPERTY INFO

Academic and non-profit institutions please order directly from The Jackson Laboratory. Commercial entities require a license from UC San Diego contact (https://innovation.ucsd.edu/contact/).

RELATED MATERIALS

▶ Liang X, Wang G, Lin L, Lowe J, Zhang Q, Bu L, Chen Y, Chen J, Sun Y, Evans SM. HCN4 dynamically marks the first heart field and conduction system precursors. Circ Res. 2013 Aug 2;113(4):399-407. doi: 10.1161/CIRCRESAHA.113.301588. Epub 2013 Jun 6. - 08/02/2013

CONTACT

University of California, San Diego
Office of Innovation and Commercialization
innovation@ucsd.edu
tel: 858.534.5815.



OTHER INFORMATION

KEYWORDS

Mice, HCN4, cardiac, mouse models, cation channel

CATEGORIZED AS

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