inotiv
analyze. answer. advance.

Genetically engineered models **(GEMS)**

Tyrosine Hydroxylase TH-Cre knockin rat

MODEL	Tyrosine Hydroxylase TH-Cre knockin rat
STRAIN	HsdSage:SD-*TH*$^{em1(IRES-Cre)Sage}$
LOCATION	U.S.
AVAILABILITY	Live colony

CHARACTERISTICS/HUSBANDRY

- Specific expression of floxed constructs in dopaminergic neurons
- No observed ectopic expression of cre
- Targeted insertion eliminates possible gene disruption that may occur in random insertion technologies such as BAC
- Background strain: Sprague Dawley

ZYGOSITY GENOTYPE

- Homozygous

RESEARCH USE

- Optogenetics
- DREADD
- Expression/knockout of floxed genes

ORIGIN

The Tyrosine Hydroxylase TH-Cre knockin rat model was originally created at SAGE Labs, Inc. in St. Louis, MO. The animal inventory was acquired by Envigo in 2019 and then by Inotiv in 2021. The line continues to be maintained through the original SAGE Labs animal inventory and is distributed out of the Boyertown, PA facility.

DESCRIPTION

This model expresses cre-recombinase under the control of the endogenous tyrosine hydroxylase (TH) promoter enabling specific expression in dopaminergic neurons. This model possesses a targeted insertion of (IRES)-cre immediately after the translational stop in the open reading frame of TH. The TH-Cre rat is useful for applications requiring tissue specific expression, including optogenetics and breeding with transgenic floxed lines.

We have observed germline excision of floxed alleles in the offspring of female rats with both a floxed allele and at least one Cre allele. We recommend breedings between female rats with homozygous floxed alleles and male rats with both Cre and floxed alleles to obtain offspring that are TH-Cre postive and homozygous for a floxed locus.

CITATIONS

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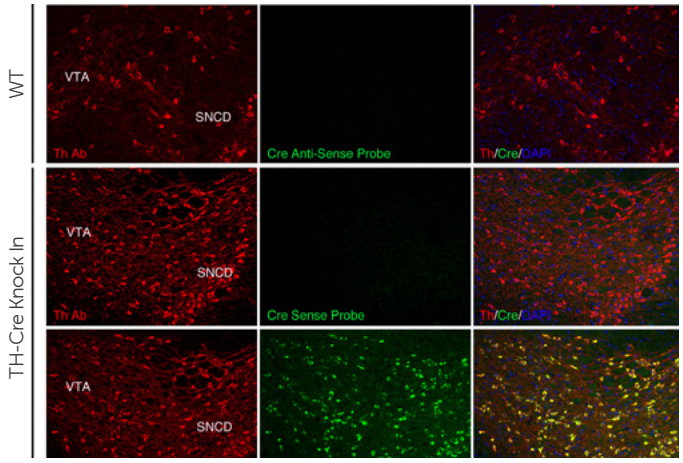

Figure 1: Cre-recombinase is expressed in TH neurons of TH-Cre rats. TH expression (red) by immunohistochemistry in neurons of the ventral tegmental area (VTA) and substantia nigra (SNCD) is shown in the left panels. In situ hybridization using sense and antisense probes to Cre was also performed (green, center panels). The third panel shows colocalization of TH and Cre in TH-Cre rats but not wild type (WT). DAPI stain in blue.

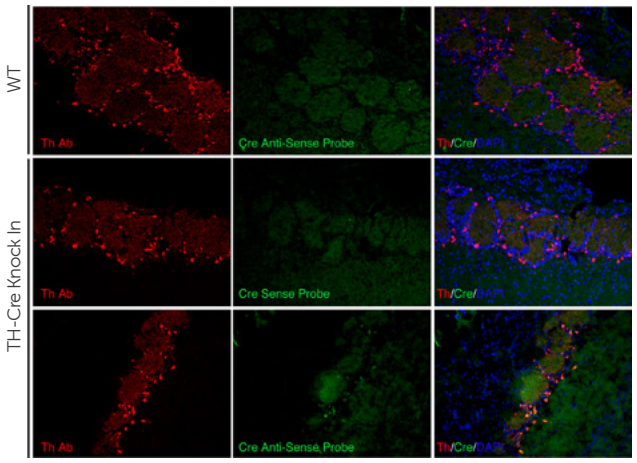

Figure 2: Colocalization of TH and Cre in olfactory bulb. Cre recombinase driven by endogenous TH promoter.

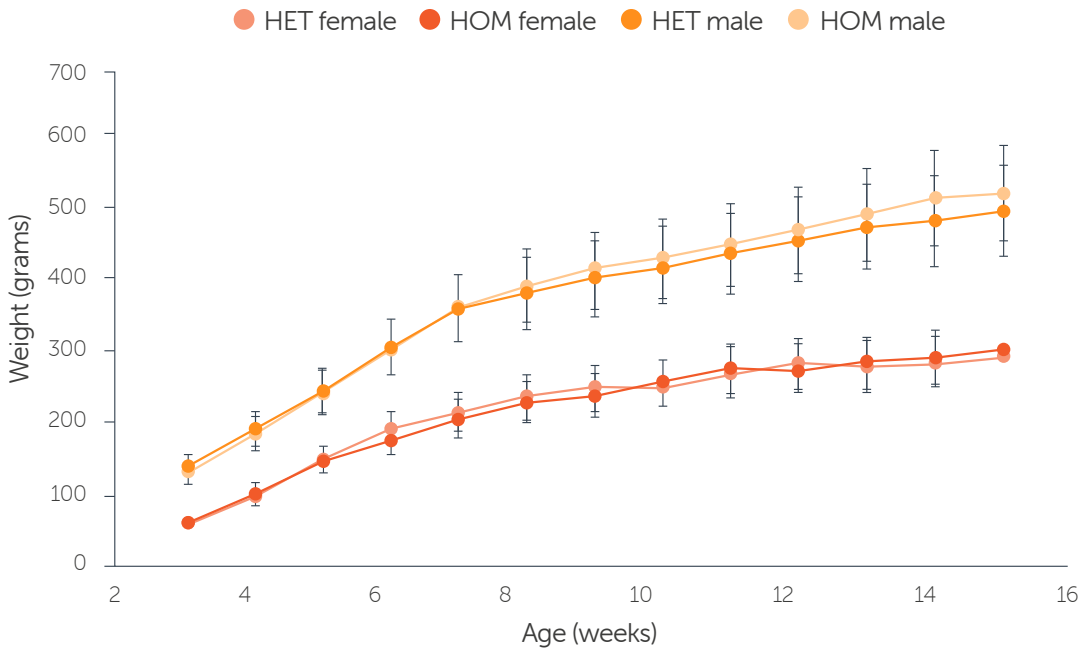

Figure 3: Age/Weight/Curve chart