MOUSE STRAIN DATASHEET

B6SJL-Tg(APPSwFlLon,PSEN1*M146I
Jax

MMRRC Stock No: 34840-JAX | **5XFAD**

Transgenic

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Overview

Also Known As: 5XFAD, Tg6799

These 5XFAD transgenic mice overexpress mutant human APP(695) with the Swedish (K670N, M671L), Florida (I716V), and London (V717I) Familial Alzheimer's Disease (FAD) mutations along with human PS1 harboring two FAD mutations, M146L and L286V. Both transgenes are regulated by the mouse *Thy1* promoter to drive overexpression in the brain. 5XFAD mice recapitulate major features of Alzheimer's Disease amyloid pathology and may be a useful model of intraneuronal Abeta-42 induced neurodegeneration and amyloid plaque formation.

Donating Investigator

Robert Vassar, Northwestern University

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GENETIC OVERVIEW

Genetic Background	Generation
100012 B6SJLF1/J	N11+N25 (2019-08-28 00:00:00)

Tg(APPSwFlLon,PSEN1*M146L*L286V)6799Vas

Allele Type

Transgenic (Inserted expressed sequence, Humanized sequence)

VIEW GENETICS

RESEARCH APPLICATIONS

Mouse/Human Gene Homologs
Neurobiology Research
Research Tools

VIEW ALL RESEARCH APPLICATIONS

Details

Detailed Description

These 5XFAD transgenic mice overexpress both mutant human APP(695) with the Swedish (K670N, M671L), Florida (I716V), and London (V717I) Familial Alzheimer's Disease (FAD) mutations and human PS1 harboring two FAD mutations, M146L and L286V. Expression of both transgenes is regulated by neural-specific elements of the mouse *Thy1* promoter to drive overexpression in the brain. Mice from this founder line have high APP expression correlating with high burden and accelerated accumulation of the 42 amino acid species of beta-amyloid (Abeta-42). 5XFAD mice generate Abeta-42 almost exclusively, rapidly accumulating massive cerebral levels. On the mixed C57BL/6 and SJL background (see MMRRC stock 34840, intraneuronal Abeta-42 accumulation is observed starting at 1.5 months of age, just prior to amyloid deposition and gliosis, which begins at two months of age. On a congenic C57BL/6J genetic background (see MMRRC stock 34848) it has been the observation of the MMRRC that this phenotype is not as robust as that demonstrated in the mixed C57BL/6 and SJL background (view data). In addition, these mice have reduced synaptic marker protein levels, increased p25 levels, neuron loss, and memory impairment in the Y-maze test. 5XFAD transgenic mice recapitulate major features of Alzheimer's Disease amyloid pathology and may be useful models of intraneuronal Abeta-42 induced neurodegeneration and amyloid plaque formation. Hemizygous mice are viable and fertile.

This strain is segregating heterozygous/wildtype for the retinal degeneration allele *Pde6b*^{rd1}.

This model is maintained by backcrossing transgenic animals to a B6SJL F1 at every generation. As a result, SJL content is segregating in the progeny of these animals. It should be noted that the Trem2 allele of SJL contains a naturally occurring variant at position 48351152 on Chr 17 (GRCm38). This C to A transition results in a stop codon at amino acid 148, S148stop (dbSNP ID: rs107649577 [Ensembl GRCm38.p6]). The predicted consequence of this variant is a protein truncation, which would remove the transmembrane helix. Mice produced from this cross could be genotypically heterozygous, homozygous or wildtype for this locus. This variant may be of particular interest to those studying the role played by Trem2 in Alzheimer Disease pathology.

NOTE: This 5XFAD strain is also available on a C57BL/6J background, which does not carry this Trem2 allele (see MMRRC stock 34848)

Development

Expression Data

Control Suggestions

Selected References

Genetics

Tg(APPSwFILon,PSEN1*M146L*L286V)6799Vas

Disease/Phenotype

Disease Terms

Research Areas By Genotype

Mammalian Phenotype Terms by Genotype

References

Technical Support

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Genotyping Protocols

Standard PCR:Generic APP human genomic or cDNA
Standard PCR:Generic Psen
Standard PCR:Pde6b^{rd1}
QPCR:Generic APP human genomic or cDNA
QPCR:Tg(APP)
Standard PCR:Generic Psen
Standard PCR:Generic APP human genomic or cDNA
Standard PCR:Generic APP human genomic or cDNA
Standard PCR:Generic APP human genomic or cDNA
Standard PCR:Generic Psen
Standard PCR:Generic APP human genomic or cDNA
QPCR:Human PSEN1 cDNA qPCR
Probe:Pde6b^{rd1}
QPCR:Generic APP human genomic or cDNA
Standard PCR:Tg(APPSwFILon,PSEN1*M146L*L286V)6799Vas-Chr3
Probe:Generic APP human genomic or cDNA
Probe:Tg(APP)
Sanger sequencing:Trem2 rs107649577-SEQ
Genotyping resources and troubleshooting

Dietary Information

LabDiet® 5K52 formulation (6% fat)

Breeding Considerations

When maintaining a live colony, hemizygous mice may be bred to B6SJLF1/J (Stock No. 100012).
Additional Breeding and Husbandry Support

Mating System

Hemizygote x F1
F1 x Hemizygote

Appearance

multiple coat colors
Related Genotype: segregating for *a*, *A*, *Oca2*^{p}, *Tyr*^{c} and *Pde6b*^{rd1}

Citation

When using the 5XFAD mouse strain in a publication, please cite the originating article(s) and include MMRRC stock #34840 in your Materials and Methods section.

Animal Health Reports

Facility Barrier Level Descriptions

AX10 (Standard)

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