

## FVB/N-Tg(GFAP-tTA)6HymS Tg(tetO-HMOX1)6HymS/J

Stock No: **031671** | GFAP.HMOX1

 Coisogenic, Transgenic

Typically mice are recovered in 10-14 weeks. Contact Customer Service to place an order or for more information.

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Tet-Off system (removal of doxycycline from diet initiates transgene expression), resulting in 1.4 to 5.8-fold increase in total of heme oxygenase 1 protein in astrocytes. Depending on the window of gene expression, these double transgenic mice exhibit inducible locomotor impairment, stereotypy, and mitochondrial damage & autophagy. They are suitable for use in applications related to the study of oxidative stress in the brain, neurodevelopment and neurodegenerative diseases.

### Donating Investigator

Hyman Schipper, McGill University

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## GENETIC OVERVIEW

Genetic Background

Generation

### Tg(tetO-HMOX1)6HymS

#### Alele Type

Transgenic (Inducible, Inserted expressed sequence, Humanized sequence)

### Tg(GFAP-tTA)6HymS

#### Alele Type

Transgenic (Transactivator)

VIEW GENETICS

## RESEARCH APPLICATIONS

VIEW ALL RESEARCH APPLICATIONS

## BASE PRICE

Starting at:

\$2,854.50 Domestic price Cryo Recovery

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### Details

#### Detailed Description

Heme oxygenase 1, encoded by the *HMOX1* gene, is an oxidative stress-response enzyme that is involved in heme catabolism: degradation of cellular heme to biliverdin/bilirubin, free iron, and CO. Up-regulated in the brains of patients with Alzheimer's disease and Parkinson's disease, heme oxygenase 1 also exhibits anti-tumor, anti-inflammatory, anti-oxidant, and anti-proliferative activity.

These GFAP.tTA.TRE.Flag.HMOX1 mice express human heme oxygenase 1 (*HMOX1*) in astrocytes under the control of the Tet-Off system. Transgene expression, induced by removal of doxycycline from the diet, is detected in CNS astrocytes, ependymocytes, and ependymal tanocytes. Immunohistochemical examination reveals no transgene expression in oligodendroglia, microglia, neurons, cerebrovascular cells. No transgene expression is observed in heart, liver, spleen, lung, kidney, stomach, intestines, or gonads. In 48 week old mice, doxycycline treatment inhibited transgene expression, as detected by RT-PCR analysis, of striatum and substantia nigra/ ventral tegmental area.

Phenotype description of induced transgenic mice (doxycycline removed from diet):

48 week old male transgenic mice, under continuous induction conditions starting from embryogenesis, exhibit impaired prepulse inhibition, and both male and female transgenic mice at 6.5 months of age exhibit hyperlocomotor activity, increased dopamine and 5-hydroxytryptamine (5-HT)/ 5-hydroxyindoleacetic acid (5-HIAA) levels, decreased neuronal reelin levels and abnormal hippocampal morphology. At this age point, the transgenic mice exhibit a phenotype with characteristics similar to human schizophrenia.

By shifting the window of transgene expression to mid-to-late life, between 8.5 and 19 months of age transgenic mice exhibit a phenotype with behavioral, pathological, neurochemical and gene expression profiles that are similar to features of human Parkinson's disease.

At this age, the transgenic mice exhibit locomotor incoordination, stereotypy, and increased alpha-synuclein and ubiquitin levels in the striatum and substantia nigra.

At 19 months of age, transgenic mice develop corpora amylacea, glycoproteinaceous inclusions (predominantly glial and extracellular).

Male transgenic mice exhibit a 1.4 to 5.8-fold increase in total heme oxygenase 1 protein levels in the brain when compared to wildtype controls, with the highest expression level in the substantia nigra/ ventral tegmental area. Ferric iron deposits are increased in the astrocytes of substantia nigra.

Ultrastructural examination of astrocytes from the amygdala and substantia nigra shows fewer mitochondria that are disorganized, dysmorphic and often swollen, as well as degraded "myelin figure" membranes in neurites near abnormal astrocytes.

While scant or no iron is detected in wildtype astrocytes (cytoplasm or organelles) by dynamic secondary ion mass

spectrometry analysis, iron is detected in dysmorphic organelles and autophagic cytoplasmic bodies of astrocytes from transgenic animals.

In a model of in situ parenchymal hemorrhage, injection of collagenase into the striata of transgenic mice results in approximately 4.5% mortality compared to the approximately 23% mortality rate of wildtype controls.

The Donating Investigator reports that there is no major phenotype difference between transgenic mice hemizygous or homozygous for the transgenes.

Mice that are homozygous for the transgenes are viable and fertile.

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### + Development

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### + Expression Data

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### + Control Suggestions

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### + Selected References

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## - Genetics

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### + Tg(tetO-HMOX1)6HymS

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### + Tg(GFAP-tTA)6HymS

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## - Disease/Phenotype

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### + Disease Terms

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### + Research Areas By Phenotype

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### + Mammalian Phenotype Terms by Genotype

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### + References

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## - Technical Support

## Genotyping Protocols

Standard PCR: [Tg\(GFAP-tTA\)6Hyms](#)

Standard PCR: [Tg\(tetO-HMOX1\)6Hyms](#)

[Genotyping resources and troubleshooting](#)

## Breeding Considerations

When maintaining a live colony, mice hemizygous or homozygous for both transgenes may be bred to each other, to wildtype siblings, or to FVB/NJ inbred mice (Stock No. [001800](#)).

## [Additional Breeding and Husbandry Support](#)

## Citation

When using the GFAP.HMOX1 mouse strain in a publication, please [cite the originating article\(s\)](#) and include JAX stock #031671 in your Materials and Methods section.

## Animal Health Reports

[Facility Barrier Level Descriptions](#)

*Production of mice from cryopreserved embryos or sperm occurs in a maximum barrier room, [G200](#)*

## [Pricing & Availability](#)



Cryo  
Recovery

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## Domestic **International**

Pricing effective for USA, Canada and Mexico shipping destinations

### CRYORECOVERY - DOMESTIC PRICING

SERVICE/PRODUCT	DESCRIPTION	PRICE
<a href="#">Cryo Recovery</a>	Hemizygous or non carrier for Tg(GFAP-tTA)6Hyms, Hemizygous or non carrier for Tg(tetO-HMOX1)6Hyms	\$2,854.50

### RELATED PRODUCTS AND SERVICES

<a href="#">Frozen Mouse Embryo</a>	FVB/N-Tg(GFAP-tTA)6Hyms Tg(tetO-HMOX1)6Hyms/J	\$2595.00
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