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Genetically engineered models **(GEMS)**

Humanized Tmprss2 (hTmprss2) Knockin Mouse

MODEL	Humanized Tmprss2 Knockin Mouse
STRAIN	C57BL/6Hsd-*Tmprss2*$^{em1(TMPRSS2)Env}$
LOCATION	U.S.
AVAILABILITY	Live colony

GENETICS BACKGROUND

- Background strain: C57BL/6

ZYGOSITY GENOTYPE

- Homozygous

RESEARCH USE

- Infectious disease
- COVID-19
- SARS & MERS

ORIGIN

The humanized Tmprss2 (hTmprss2) knockin (KI) mouse model was created at the Inotiv St. Louis, MO, model creation facility in 2020 and is maintained and distributed by Inotiv.

DESCRIPTION

Tmprss2 is a transmembrane serine protease that is involved in viral infection. Both influenza viruses and human coronaviruses, including HCoV-229E, MERS-CoV, SARS-CoV, and SARS-CoV-2, depend on Tmprss2 proteolytically cleaving (i.e., priming) the viral spike glycoprotein, which triggers fusion of the viral envelope and host cell membrane, allowing the virus to enter the cell. Tmprss2 also has a pivotal role in the development and progression of prostate cancer. The fusion of the *TMPRSS2* gene with the ERG oncogene is the most frequent genomic alteration in prostate cancer.

The hTmprss2 KI mouse model was generated using CRISPR-based technology to mediate the integration of a codon optimized human *TMPRSS2* cDNA expression cassette into the mouse *Tmprss2* gene locus. As a result, the mouse *Tmprss2* gene promoter and other regulatory elements will drive the human Tmprss2 protein expression whereas the mouse *Tmprss2* gene expression will be terminated.