K18-hACE2 transgenic mice express human ACE2, the receptor used by the severe acute respiratory syndrome coronavirus (SARS-CoV) to gain entry to cells. Expression is driven in epithelia by a human cytokeratin 18 (K18) promoter. Most importantly, expression is observed in airway epithelial cells where infections typically begin. This model of lethal infection with SARS-CoV mimics the human disease and should be useful for studies of pathogenesis and for the development of antiviral therapies for SARS. Recent research indicates that this line may also be useful in studies related to the study of 2019 novel coronavirus (SARS-CoV-2) pathogenesis and the disease outbreak COVID-19.

View in Mandarin

UPDATE 2/25/2020: This model is now available for preorder. JAX is using state-of-the-art breeding techniques to rapidly build this colony. We will notify those who preorder when the mice are available for distribution. To learn more about this mouse model and other infectious disease models from The Jackson Laboratory please contact: micetech@jax.org - 1.800.422.6423 (US) - 1.207.288.5845 (International).

Donating Investigator

Dr. Stanley Perlman, Carver College of Medicine

Dr. Paul B McCray, University of Iowa
**Genetic Background**

<table>
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<th>Genetic Background</th>
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**Tg(K18-ACE2)2Prlmn**

**Allele Type**

Transgenic (Inserted expressed sequence)

---

**RESEARCH APPLICATIONS**

Internal/Organ Research  
Virology Research  
Research Tools  
Developmental Biology Research  
Immunology, Inflammation and Autoimmunity Research

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**BASE PRICE**

Starting at:

$106.00 Domestic price for female 4-week

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**Detailed Description**

*K18-hACE2* transgenic mice express the receptor for severe acute respiratory syndrome (SARS), caused by a coronavirus (SARS-CoV) in airway and other epithelia under control of the human cytokeratin 18 (*K18*) promoter. Specifically, these mice contain 2.5 kb of the *K18* genomic sequence, including the promoter, and the first intron (with a mutation in the 3’ splice acceptor site to reduce exon skipping) and a translational enhancer (TE) sequence from alfalfa mosaic virus, upstream of the human angiotensin I converting enzyme (peptidyl-dipeptidase A) 2 coding sequence (*hACE2*), followed by exons 6-7 and the poly(A) signal of the human *K18* gene. These elements have been found to be necessary for high-level expression and
epithelial cell specificity of hACE2, the primary host cell receptor for SARS-CoV. In these mice, from founder line 2, K18-hACE2 transgene expression is evident in airway epithelial cells (but not in alveolar epithelia), as well as in epithelia of other internal organs, including the liver, kidney, and gastrointestinal tract. Recent research indicates that this line may also be useful in studies related to the study of 2019 novel coronavirus (SARS-CoV-2) pathogenesis.

Hemizygous mice are viable and fertile. The donating investigator has not attempted to make a homozygous colony.

These K18-hACE2 mice develop a rapidly lethal infection after intranasal inoculation with a human strain of SARS-CoV. Infection begins in airway epithelia, with subsequent alveolar involvement and extrapulmonary virus spread to the brain. Infection results in macrophage and lymphocyte infiltration in the lungs and upregulation of proinflammatory cytokines and chemokines in both the lung and the brain. By days 3 to 5 postinfection, K18-hACE2 mice begin to lose weight and become lethargic with labored breathing. Mice from this founder line are moribund 4 days after inoculation, and all mice are dead 7 days after inoculation. Transgenic expression of hACE2 in epithelia converts a mild SARS-CoV infection into a rapidly fatal disease. [McCray et al. 2007 J Virol. 81:813 (PMID:17079315)]

This strain ships with a RapID Ear Tag affixed. Learn more about RapID Ear Tag.
Genotyping Protocols
Separated PCR: GAL Panel-B6J vs. B6N
Standard PCR: Tg(K18-ACE2)2Prlmn

Genotyping resources and troubleshooting

Breeding Considerations

When maintaining a live colony, investigators may breed hemizygous mice to wildtype (non-carrier) mice from the colony, or to C57BL/6J inbred mice (Stock No. 000664). It is unknown at this time (January 2020) if homozygous mice are viable and fertile.

Additional Breeding and Husbandry Support

Mating System
- Hemizygous x C57BL/6J (000664)
- C57BL/6J (000664) x Hemizygote
- Noncarrier x Hemizygote
- Hemizygote x Noncarrier

Citation

When using the K18-hACE2 mouse strain in a publication, please cite the originating article(s) and include JAX stock #034860 in your Materials and Methods section.

Animal Health Reports

Facility Barrier Level Descriptions

- AX18 (Maximum)

Pricing & Availability

Estimated to begin distribution on Jun 22, 2020

Available for Pre-order

Domestic Pricing for
- Commercial & For-Profit
- Not-For-Profit & Academic

Live Mouse

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Terms Of Use

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