NCG-hACE2(all humanization)

Strain Name：NOD/ShiLtJGpt-$Prkdc^{em26Cd52}Il2rg^{em26Cd22}$/Gpt-$Ace2^{em1Cin(hACE2)}$/Gpt

Strain Type：Knock-in

Strain Number：T037766

Strain Background：NOD/ShiLtJGpt

Description

SARS-CoV-2 binds to the ACE2 receptor on the surface of human cells through the spike protein (S protein), thereby entering the cell body for replication and infection, causing a cascade of immune responses and cytokine storms. Angiotensin-converting enzyme (ACE)2, also known as ACeh, is a Zn metalloprotease, which belongs to type 1 transmembrane protein. The structure includes a signal peptide, a transmembrane domain and a metalloprotease containing HEXXH zinc binding domain Active site.

The gene ACE2 is located on the X chromosome and is mainly expressed in the gastrointestinal tract, heart, kidney, lung, testis and brain. There are key differences between human ACE2 and mouse ACE2 sequences. SARS-CoV-2, which can infect humans, may not infect mice. Therefore, wild-type mice are not suitable for virus research and vaccine development.

Severe immune-deficient strain NCG is established by CRISPR/Cas9 technology. *Prkdc(Protein kinase, DNA activated, catalytic polypeptide)* and *Il2rg* （*Common gamma chain receptor*）genes are knocked out on NOD/ShiltJGpt background. The genetic background of NOD/ShiltJGpt makes this line have natural immunodeficiency, such as complement system and macrophage defects.

GemPharmatech uses gene editing technology to develop a humanized mouse model of ACE2, which simulates the clinical manifestation of human infection with the new coronavirus. ACE2 humanized mice were made on NOD/ShiLtJGpt-$Prkdc^{em26Cd52}Il2rg^{em26Cd22}$/Gpt background mic, the CDS of human ACE2 gene is inserted downstream of the mouse Ace2 gene. Human ACE2 will be expressed under the transcriptional regulation of the mouse endogenous Ace2 gene for simulation Human severe COVID-19 phenotype.

Applications

1、Study on the mechanism of SARS-CoV-2

2、Evaluation of the efficacy and safety of SARS-CoV-2 vaccines or inhibitors

3、Autoimmune disease research