1. No.

   2021Y009

2. Title

   The establishment of COVID-19 Cytokine storm model and the analysis of molecular mechanisms

3. Period

   2021-2023

4. Summary

   We have been working on " The establishment of COVID-19 Cytokine storm model and the analysis of molecular mechanism" funded by the foundation. Based on the IL-6 amplifier, which we discovered and reported, we have focused on the involvement of cytokine storms in the pathogenesis of COVID-19 infection. In this study, we established a model of SARS-CoV-2 infection using genetically engineered mice and stress stimuli, and in this model, gastrointestinal inflammation is thought to be involved in the severity (lethality) of COVID-19 infection. Furthermore, administration of neutralizing antibodies against IL-6 amplifier related factors to the mouse model suppressed sudden death, indicating that a cytokine storm occurs in this model. Furthermore, we are currently analyzing the function of BHB, which is related to energy metabolism, to understand why inflammation occurs in the gastrointestinal tract. In fact, stress and infection cause a decrease in serum glucose concentration and an increase in BHB concentration, and administration of BHB enhances sudden death, which is highly likely to be the phenotype of this model. Further detailed functional analysis will be performed in the future.