1. No.
   2022Y004

2. Title
   The Effect of Chronic Activation of Nicotinic Acetylcholine Receptors on Neuro-Immune System

3. Period
   2022-2024

4. Summary
   In our living environment, there is both "good stress" and "bad stress". In order to sense stress and show an appropriate biological response, the flow of “receptor-afferent nerve-central-efferent nerve-effector organ” is important. In this study, we focused on the fact that not only the local immune system but also the peripheral and central nervous systems (afferent and efferent nerves) are involved in disease control, and aimed to elucidate the mechanism of stress-dependent immune control centered on the α7 nicotinic acetylcholine receptor (α7 nR) expressed in immune cells. Specifically, we set the following three tasks and sought answers to the questions in this study. 1) The effect of vagus nerve stimulation on the pneumonia-reducing effect, 2) The effect of chronic stimulation of medullary C1 neurons on the pneumonia-reducing effect, and 3) The effect of acute and chronic stimulation of medullary C1 neurons on the properties of immune cells will be elucidated to comprehensively interpret the effect of chronic nicotinic acetylcholine receptor stimulation on the nervous-immune system. This study demonstrated that normal function of the spleen and adrenal glands is important for immune control via the nervous system, and that the breakdown of this system due to long-term chronic stress weakens the defense mechanism against disease.