

Elucidation of the mechanism of serotonin over optimism and pessimism

Project manager

(selected in 2021)

**MIYAZAKI
Katsuhiko**

Okinawa Institute of Science and
Technology Graduate University
(OIST), Neural Computation Unit,
Senior Staff Scientist



Leader's institution

OIST

R&D institutions

OIST

Summary of the project

The optimism that "I'm sure things will go well" is one of the essential mental vitalities for believing in an uncertain future and for overcoming difficulties and paving the way for your life. By 2050, this research aims to visualize this mental vitality and power to live, and to create a future in which we can further improve it ourselves.

This project aims to examine what kind of difference will occur in the serotonin neural network, which has been shown to play a role in regulating patience for future rewards, when mice perform the same behavior but the purpose of the behavior is different for "attainment of reward" or "avoidance of punishment". We hypothesize that serotonin works to regulate "optimism / pessimism" toward achieving the goal and we will examine the serotonin neural network by neural recording and neural manipulation of task performing mice. By clarifying the neural mechanism of "the optimism that creates patience" or "the pessimism that leads to giving up", we aim to realize a society in which people can improve their "ability to overcome the difficulties of life" and "vitality of the mind".

Milestone by the end of the project (2024)

Elucidation of the serotonin subsystem in the brain that is causally related to optimism (confidence in the future) and pessimism (giving up on the future).

Project structure

