

Research

Neural regulation of energy homeostasis

One of the biggest challenges of the modern society is the conflict between the eating regulation mechanisms shaped by evolution to survive under food-scarcity and the food abundance in majority of the world brought by technological revolution. Such challenge led to rapid growing epidemic of obesity and many other metabolic diseases.

Genetic factors together with environmental or social influences shape neural circuits and determine behavioural outcomes. Energy homeostasis and metabolism are tightly regulated by brain in mammals and maladaptation of the underlying neural circuits is crucial for the development of metabolic diseases.

Elucidating how the genetically defined neural circuits respond to the change of lifestyle will provide new insights in better treating metabolic diseases. Our research focuses on revealing the neural circuits of energy homeostasis regulation and the mechanisms of the plastic change of these circuits in response to change of lifestyle.

We use an array of cutting-edge technologies in systems neuroscience research, including 2-photon microscope with virtual reality system, microendoscope, fiberphotometry, light sheet microscope, functional MRI and molecular/viral tools. We also develop new transgenic mouse lines for investigating specific subgroups of brain cells.