It still remains a mystery how neurons are orchestrated in the functional brain. One reason has been the lack of techniques for precise manipulation of single neuronal function and simultaneous observation of multiple neuronal activities. Recent advance of optogenetics and other techniques has been providing us methods to unravel causal relationships between neuronal circuit computations and cognitive behaviors, through manipulations of targeted neurons. Here, we will introduce up-to-date studies that utilize optogenetic, recording, and imaging techniques to understand the brain function in health and disease.
Methodologies for the study of circulatory system in vivo

Takuro Tomita (Div. of Cardiocirculatory Signal., Okazaki Institute for Integrative Bioscience (NIPS), NINS)
Naoya Matsunaga (Dept. Pharmaceutics, Fac. Pharmaceutical Sci., Kyushu Univ.)

WS2E-1  Application of physical medicine to the prevention of chronic diseases

WS2E-2  Cutaneous microangiopathy model associated with cold-induced vasoconstriction

WS2E-3  Influence of the molecular clock in the kidney-liver-kidney axis under chronic kidney disease (CKD)

WS2E-4  Establishment of a novel therapeutic strategy using mouse models for heart failure

Outline of Symposium

In the field of pharmacological research, development of animal model which recapitulate human diseases is fundamental. However, simple productions of transgenic animals are insufficient to reveal the importance of target molecules in most cases. Therefore, there are strong demands for animal models able to represent the physiological relevance of specific genes and proteins clearly. In this workshop, in vivo methodologies to study various circulatory system will be presented. Furthermore, a novel physical therapy with disease model mice will be introduced.
Human induced pluripotent stem cell (hiPS)-derived cardiomyocytes (CM) are commercially available now.

In the result, topics of interest in hiPS are moving to its medical and industrial applications from the cell differentiation and/or induction. In this workshop, we will introduce the electropharmacological research with hiPS-CM sheets on its automaticity, excitability, conductivity and contractility by experts. We will also discuss the utility and limitation of hiPS-CM sheets especially at applications in drug development and provide new information to researchers, who want to begin to use iPS-CM sheets.
Recent development of fluorescence imaging techniques opens the new era of pharmacological studies. However, it is often difficult to apply and reproduce the cutting edge imaging techniques only by referring the description in published articles. There seems to be unpublished secrets and tips which first authors consciously or unconsciously make full use of. In this workshop, we will discuss details of actual imaging experiments in depth with skillful young researchers to uncover and share secrets and tips for cutting edge imaging techniques.
WS3D-5 Workshop 5

Behavioral pharmacology for beginner scientists

Soichiro Ide (Dept. Pharmacol., Grad. Sch. Pharmaceut. Sci., Hokkaido Univ.)

WS3D-5-1 Introduction to behavioral pharmacology

WS3D-5-2 Behavioral pharmacological assessment of animal models of depression and anxiety

WS3D-5-3 Assessment of cognitive function in animal models

WS3D-5-4 Behavioral pharmacological assessment of animal pain models

Outline of Symposium

Behavioral pharmacology is a science to research the interaction between drugs and neuropsychiatric function and contributes the development of therapeutic drugs. Moreover, behavioral pharmacology also plays the important roles to elucidate the novel neuropsychiatric functions and develops animal behavioral models. In this workshop, for beginner scientists, we will introduce the validation and important note in behavioral-pharmacological evaluation methods, focusing on the emotional function/anxiolytics/antidepressants, cognitive function/nootropics and sensory function/analgesics.
In this symposium, we will discuss Innovation Science and Technology for Japanese aging society and Pharmacology. Research and development on the stage before actual disease (Mibyou stage) control system using safe and high quality Kampo medicine and information and communication technology is useful for the Center of Innovation (COI) program by Ministry of Education, Culture, Sports, Science and Technology. Kampo medicine involves caring for one’s health at the Mibyou stage and is believed to prevent various disease. The objective of this symposium is that understand the necessity of a pharmacological knowledge in the innovation science and technology for Japanese aging society.
Biomarkers reflect the development, progression and healing process of diseases. Even though tones of efforts have been poured into biomarker studies so far, almost all of those attempts have concentrated into individual target diseases. Therefore, the difference and similarity of biomarkers among diseases have been poorly investigated. By comparing the latest biomarker studies in cancer, cerebrovascular, skin as well as allergic diseases, and those for diagnosis, pathogenesis as well as responsiveness to therapy, this session proposes a practical and pharmacological application of biomarkers.