## Integrative understanding of biological phenomena with temperature as a key theme

http://www.nips.ac.jp/thermalbio/

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| Number of Research Area | : | 3702 | Term of Project : FY2015-2019 |
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| Research Institution | : | National Institutes of Natural Sciences, Okazaki Institute for Integrative Bioscience, Professor | |

Temperature affects various physiological functions, and is one of the most important factors for the homeostasis. In this project, we will clarify the following two things; 1) mechanisms for temperature detection and their contribution to cell physiology in a concert manner through thermo-sensing machineries between cell membrane and cytosol, 2) mechanisms for integration of the temperature information and how they regulate physiological functions at the tissue or whole-body level including body temperature, metabolism, biological rhythms and behaviors. Furthermore, we will develop and apply the ways of local temperature sensing and its regulation both inside of the cells and in tissues/organs.

In A01 'Temperature Sensing', we will especially focus on the researches of how molecules in cell membrane and cytosol and intracellular metabolism are involved in temperature sensing, and the researches developing new techniques for local temperature detection and regulation in the cell. In A02 'Temperature-responding System', we will focus on the researches to clarify how temperature information is integrated, how temperature affects metabolism and biological rhythm, how temperature information leads to emotions. We will also develop and apply the ways of local temperature sensing and its regulation at the tissue and organ levels.

All the researches proposals related to the above issues will be welcome. Especially, we will take research proposals with high originality which could enhance the collaboration. There seem to be wide range of temperature-related researches including hibernations, sleep and metabolic disorders such as obesity and diabetes. All such researches would be welcome. Although many of the core members of this research groups are working on rodents, the researches with other animals including humans and with evolution would also be great. We would like to discuss the diversity and universality of the temperature-related phenomenon. The research proposals to develop novel systems for temperature detection and regulation in the cells and tissues/organs with high precision and resolution would also be recommended

| Research Group | Upper Limit of Annual Budget (Million yen) | Number of research projects scheduled to be selected |
|---|---|---|
| Temperature Sensing | 4 | 20 |
| Temperature-responding System | | |
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