

Biological Sciences
**Title of Project : Dynamic regulation of brain function
by Scrap & Build system**

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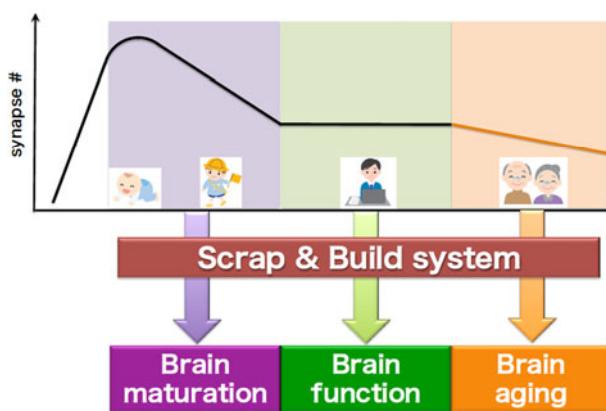
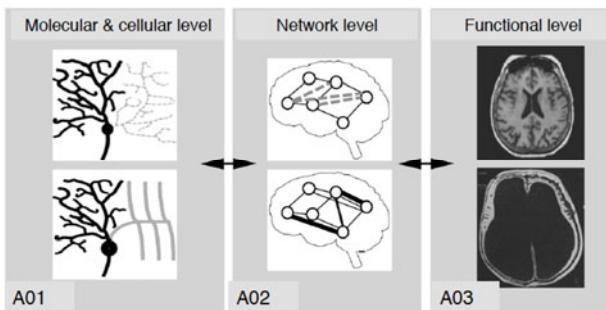
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Research Project Number : 16H06455 Researcher Number : 80300953

【Purpose of the Research Project】

Organisms typically achieve functional reorganization by scrapping a part of body/tissue structure with building a new structure in response to environmental changes. This scrap & build phenomenon is particularly significant in the nervous system. Neural network in the brain changes network structures in multiple different scales during distinct developmental stages: In the developing brain of infants, neurons often scrap & build whole neurites to modify connections between specific brain regions. In the matured brain, by contrast, neural circuits mainly scrap & build synapse in a few micron level. In this project, we will focus on the scrap & build phenomenon in the nervous system and clarify (1) molecular and cellular mechanisms of neural scrap & build, (2) network mechanisms of scrap & build coordination, and (3) significance of the neural scrap & build system in the brain function and disease.

brain function.

**【Content of the Research Project】**

This inter-disciplinary research project aims to understand mechanisms of spatio-temporal regulation of the neural scrap & build system and how the neural scrap & build system regulate brain function and pathology. To this end, this project is basically composed of three subgroups: A01 will investigate molecular and cellular mechanisms underlying the scrap & build system of neural circuits. A02 will focus on the circuit mechanisms that mediate spatio-temporal coordination of the neural scrap & build processes. A03 will reveal the functional relationship between the neural scrap & build system and

【Expected Research Achievements and Scientific Significance】

The scrap & build phenomenon is recently observed in multiple tissues including vascular tissue. Scrap & build system is thus likely to be a universal mechanism responsible for the functional reorganization of multicellular organisms. We expect that this project will provide impacts on a variety of research fields of biology including cell biology, developmental biology, vascular biology, and immunology. We also expect that techniques and resources to be developed for principle elucidation of the neural scrap & build can be applied to various research areas. Researches in this project are expected to provide basic information and experimental system that can contribute to clinical researches, as dysfunction of the neural scrap & build shown to be related to developmental disorder and mental disease.

【Key Words】

Spatio-temporal regulation of neuronal plasticity
Brain function and pathology

【Term of Project】 FY2016-2020**【Budget Allocation】** 1,179,100 Thousand Yen**【Homepage Address and Other Contact Information】**

<http://www.scrapandbuild.bs.s.u-tokyo.ac.jp/>