

Japanese research organizations contribute to Human Brain Project

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One of the major frontiers of modern science is a comprehensive understanding of the human brain and its functions to guide the development of new technologies in information and communication. In a major announcement for the globalization of science, two Japanese research organizations, the Okinawa Institute of Science and Technology Graduate University (OIST) and RIKEN, will join forces with a large European consortium on the Human Brain Project (HBP) which the European Commission has officially announced as one of two Future and Emerging Technology (FET) Flagship projects. The new project will federate international efforts to understand and simulate the human brain for the creation of new technological advances for society.

The goal of the Human Brain Project is to combine all existing knowledge about the human brain and to reconstruct the brain, piece by piece, in supercomputer-based models and simulations. The models will offer the prospect of a new understanding of the human brain and its diseases and of completely [new computing](#) and robotics technologies. On January 28, the European Commission supported this vision, announcing that it has selected the HBP as one of two projects to be funded through the new FET Flagship Program. With more than 80 European and international research institutions, the Human Brain Project will last for ten years (2013-2023). At a cost estimated at 1.19 billion euros the HBP will become one of the most ambitious efforts in the history of science that will focus international efforts on research objectives expected to stimulate the global economy.

OIST's contribution is led by Prof. Erik De Schutter, whose team participates in the development of the Brain Simulation Platform, a major software infrastructure effort. Specifically, the team at OIST will contribute its experience in programming software for the spatial simulation of the interaction between electrophysiological events and

[biochemical reactions](#) in neurons.

"We are delighted that OIST will participate in this major international initiative," said De Schutter. "Our major challenge is how to integrate fine scale of modeling at the molecular level with large-scale modeling of whole brain regions."

The RIKEN Brain Science Institute will contribute to the identification of the brain structures underlying mental capabilities. By listening to the brain's activity during behavior, RIKEN investigators hope to reveal new principles of the mind and cognition. This information will guide the construction of the HBP brain model and stimulate the development of a new generation of brain-based technologies. Participating RIKEN faculty include Keiji Tanaka, Naotaka Fujii and Justin Gardner.

Dr. Naotaka Fujii will participate in the group studying the capabilities and characteristics of the human brain; Symbols, Language and The self. Dr. Fujii's team will contribute to the Language group by revealing the neural network mechanisms of primates during nested sequential stimuli. Drs. Keiji Tanaka and Justin Gardner will participate in the group studying the mechanisms of multimodal information integration in the brain. They will study the mechanisms by which semantic knowledge of the world is developed based on visual object representations as well as the mechanisms by which prior knowledge about the world influences visual perception.

Charles Yokoyama, Director for Research Administration and Coordinator of the RIKEN Brain Science Institute-Human Brain Project Collaboration Center, said: "The participation of RIKEN in the [Human Brain](#) Project marks a new era in international collaboration to study the brain; such a large-scale, coordinated effort is needed to benefit society."

The project will begin work in the closing months of

2013 and will be coordinated at the Ecole Polytechnique Fédérale de Lausanne (EPFL) in Switzerland, by neuroscientist Henry Markram with co-directors Karlheinz Meier of Heidelberg University, Germany, and Richard Frackowiak of Clinique Hospitalière Universitaire Vaudoise (CHUV) and the University of Lausanne (UNIL).

More information:

www.humanbrainproject.eu/vision.html

Provided by RIKEN

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