Details of Technology

Name of Technology	Neural mechanisms in animal behavior	Medical Treatment and Welfare
Name/Post/Faculty	Tetsuya Matsuura / Associate Professor / Department of Chemistry and Bioengineering Academic Group, Faculty of Engineering	
Key words	animal behavior, electrophysiological analysis, gene expression	

What kind of technology is this?

Outline

BY this technology, the active states in one neuron can be investigated and the changes in the gene expression can be analyzed. The behavior analytical technology is now under development.

【Outline】 Using the insects and nematodes as the model animals, I am now investigating what kinds of the neural basis are involved in the behavior of the higher animals including human beings.

【Details】 The animals are selecting the appropriate behavior pattern by perceiving the environmental changes. The auditory system in owls is designed to be able to catch field mice even in the dark. Crickets initiate the escape behavior by catching the turbulence and direction of the airstream caused by a predator with the cercal sensory interneuron. We are now studying on the behavior switching to an identical stimulation, namely the neural mechanism involved in selection of the motor program (Fig. 1). Using a nematode (*Caenorhabditis elegans*), a model animal for behavioral genetics, we are now developing the behavioral and physiological studies on the neural basis of chemotactic behavior and leaning, from the biological and engineering interdisciplinary points of view (Fig. 2).

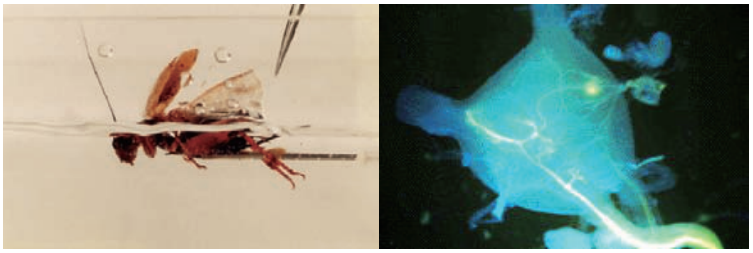

Fig. 1 Cricket flying in water (left) and giant interneuron

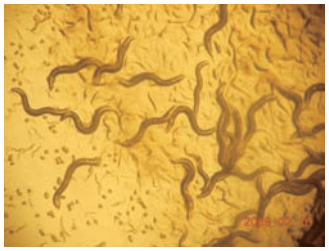

Fig. 2 Nematode as a model animal

What are its applications?

○ This is an important model to understand the biological mechanism in higher animals including human beings.
○ The fine sensory ability of animals can apply to the welfare engineering field.

Related patents	
Related materials	http://www.wel.iwate-u.ac.jp/matsuura/

CERECO 4-3-5 Ueda, Morioka, Iwate 020-8551 Japan
Phone : +81-19-621-6494 FAX : +81-19-604-5036
e-mail : iptt@iwate-u.ac.jp