## Science News



# Marine Snail's Neural Network Sheds Light On The Basis For Flexibl Behavior

*ScienceDaily (Oct. 12, 2005)* — From snail to man, one of the hallmarks of the brain is the ease with which behavioral variants are generated--for example, humans can easily walk with different stride lengths or different speeds. By studying how a relatively simple motor network of the marine snail Aplysia produces variants of a particular feeding behavior, researchers have found that the ability to generate a large number of behavioral variants stems from the elegant hierarchical architecture of the brain's motor network.

*By studying how a relatively simple motor netw of the marine snail Aplysia produces variants c particular feeding behavior, researchers have f that the ability to generate a large number of behavioral variants stems from the elegant hierarchical architecture of the brain's motor network. (Credit: Timothy Kang, Jin-sheng Wu Jian Jing)*

*See also:*

**Mind & Brain**
- Neuroscience
- Behavior
- Psychology

**Plants & Animals**
- Behavioral Science
- Developmental Biology
- Biochemistry Research

**Reference**
- Sensory neuron
- Motor neuron
- Mirror neuron
- Dementia with Lewy bodies

Most motor systems are organized into a hierarchy of at least two layers of neurons, with higher-order neurons acting on lower-order neurons, which form a small number of building blocks or modules that produce a variety of behaviors. However, it was not clear how variants of a single motor act are generated in such a hierarchical system.

In the new work, Jian Jing and Klaudiusz Weiss of the Mount Sinai School of Medicine in New York studied the feeding network of Aplysia, which exhibits a biting behavior in response to the presence of food. The researchers showed that within the feeding network, two higher-order neurons that are active during biting behavior employ a combinatorial mechanism to produce variations in one particular movement parameter of the biting behavior. The researchers showed that, tellingly, these higher-order neurons accomplish their roles through their specific actions on two groups of lower-order interneurons that directly influence the particular biting-behavior movement parameter. Therefore, in this system, and likely others, the generation of large numbers of behavioral variants is characterized by higher-order neurons that flexibly combine an "alphabet system" of outputs that are generated by lower-order modules within the brain's motor network.

Health.

Jing et al.: "Generation of Variants of a Motor Act in a Modular and Hierarchical Motor Network." Publishing in Current Biology, Vol. 15, 1712-1721, October 11, 2005. DOI 10.1016/j.cub.2005.08.051 http://www.current-biology.com/

*Adapted from materials provided by Cell Press, via EurekAlert!, a service of AAAS.*

Email or share this story: BOOKMARK

Need to cite this story in your essay, paper, or report? Use one of the following formats:

APA: Cell Press (2005, October 12). Marine Snail's Neural Network Sheds Light On The Basis For Flexible Behavior. *ScienceDaily*. Retrieved December 11, 2008, from file:///C:/Documents%20and%20Settings/ai/Marine%20Snail's%20Neural%20Network%20Sheds%20Light%20On%20The%20Basis%20For%20Flexible%20Behavior.htm

MLA

*Number of stories in archives: 44,032*

**UCLA Neuroscienti Gains Insights Into Human Brain From Study Of Marine Sn** (Dec. 14, 2004) — What can cellular neuroscie learn about the human brain from studying a m snail? Much more than one might suspect. "Or cell biological level, the mechanisms of learnin memory ... > *read more*

**Marine Snail Study Leads To New Ins Into Long-term Memory** (June 23, 200 Cellular neuroscientists are providing ne insights into the mechanisms that under long-term memory -- research with the potentia treat long-term memory ... > *read more*

**How Many Genes Does It Take Learn? Lessons From Sea Slu** (Dec. 29, 2006) — At any given t within just a single brain cell of s slug known as Aplysia, more than 10,000 gene active, according to scientists writing in Cell. Researchers also analyzed 146 human genes > *read more*

**Researchers Characterize Mollusk Insulin G Find Unique Peptide** (Oct. 7, 1999) — Researchers at the University of Illinois have isolated, sequenced and characterized an insu gene from the marine mollusk Aplysia californi The gene's structure -- though similar in form . > *read more*

*Find with keyword(s):* Search

Enter a keyword or phrase to search ScienceDaily's archives for related news topics, the latest news stories, reference articles, science videos, images, and books.