


[News](#)
[Articles](#)
[Videos](#)
[Images](#)
[Books](#)
[Health & Medicine](#)
[Mind & Brain](#)
[Plants & Animals](#)
[Earth & Climate](#)
[Space & Time](#)
[More](#)

Science News

[Share](#) [Blog](#)

Marine Snail's Neural Network Sheds Light On The Basis For Flexible 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 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. (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.

Ads by Google

[Advertis](#)

Environment Protection

Solutions to reduce environmental impact via communication technology
unite.nokiasiemensnetworks.com

The Theory of Everything

Some physicists think the mind is at the heart of modern physics.
NewPhysicsAndTheMind.net

The Biology of Belief

Scientific evidence showing how your beliefs affect your biology.
www.Cygnus-Books.co.uk

AnesthesiaNow.com

Free access to the latest scientific and clinical literature.
www.AnesthesiaNow.com





Free Technology Research

Browse Our Technology & IT Articles Online.
 Subscribe to Weekly Report!

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 Neuroscientist Gains Insights Into Human Brain From Study Of Marine Snail

(Dec. 14, 2004) — What can cellular neuroscience learn about the human brain from studying a marine snail? Much more than one might suspect. "On the cellular biological level, the mechanisms of learning and memory ... [read more](#)



Marine Snail Study Leads To New Insights Into Long-term Memory

(June 23, 2006) — Cellular neuroscientists are providing new insights into the mechanisms that underlie long-term memory -- research with the potential to treat long-term memory ... [read more](#)



How Many Genes Does It Take To Learn? Lessons From Sea Slug

(Dec. 29, 2006) — At any given time, within just a single brain cell of a sea slug known as Aplysia, more than 10,000 genes are active, according to scientists writing in *Cell*. Researchers also analyzed 146 human genes ... [read more](#)

Researchers Characterize Mollusk Insulin Gene, Find Unique Peptide

(Oct. 7, 1999) — Researchers at the University of Illinois have isolated, sequenced and characterized an insulin gene from the marine mollusk Aplysia californica. The gene's structure -- though similar in form to human insulin ... [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.

Ads by Google

Advertisements

Depression Cured in 3 Min

3 Minutes to Joy without Depression
Find Your Depression Facts Here.
www.Cure-Depression-Now.com

Research Denmark

The Official Guide to Denmark. Latest research in Denmark!
www.Denmark.dk/Science

*About This Site | Editorial Staff | Awards & Reviews | Contribute News | Advertise With Us | Privacy Policy
| Terms of Use*

Copyright © 1995-2008 ScienceDaily LLC — All rights reserved — Contact: editor@sciencedaily.com