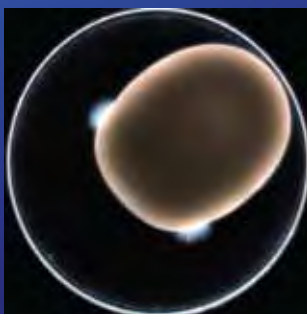




## Worming its way into evolution



Few of us imagine our brains bear the slightest resemblance to those of worms wriggling in mudflats.

Chris Lowe does. He looks to creatures crawling in the Tahitian soil to study the inner workings of the human mind.

"Studying the vertebrate brain itself won't tell you anything about the evolutionary origins of our brain," said Lowe, PhD, an evolutionary biologist at the University of Chicago. "You need to conduct research from before our brain even existed."

The worms Lowe studies, *Saccoglossus kowalevskii*, are hemichordates, meaning they share some fundamental similarities with both vertebrates—like us—and echinoderms, like starfish and sand dollars.

Rather than a central nervous system, which in vertebrates acts as a command center for the rest of the body, these worms have a diffused nervous system spread throughout their bodies. It is sometimes referred to as a "skin brain."

"There are two hypotheses," Lowe said. "Did our common ancestor have a central nervous system and lose it in many groups, or did the common ancestor have a diffuse nervous system, which vertebrates modified to become a central nervous system?"

In search of an answer, Lowe journeys to far-flung spots like Australia and Tahiti to collect worm eggs.

"We're asking evolutionary questions of an animal that would never have been picked to study developmental biology" because its specimens are so difficult to obtain, he said.

Despite the geographic challenge, Lowe said the effort is well worth it if it leads to better understanding, not only about the worms but also about other animals.

"One of the biggest surprises in evolutionary biology has been that even though the morphology wasn't conserved between two animals," he said, "the genetic map was."

—Megan Seery

**On these pages:** Hemichordates, including the worm-like structure above, *Saccoglossus kowalevskii*. Christopher Lowe studies this species, specifically their "skin brain."

Photos courtesy of Chris Lowe and Peter Parks/  
[imagequestmarine.com](http://imagequestmarine.com)

**On the cover:** Hutterites of South Dakota.

Photos by Jason Smith



