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Snail shell spiral switched

Nov 26, 2009 [2 comments](#)**Snail shock** Chirality reversed in *Lymnaea stagnalis*

Researchers in Japan have altered the destiny of a rout of snails by changing the chirality of their shells before birth. By delicately manipulating a batch of developing embryos, the scientists successfully reversed the spiral shells of over 100 *Lymnaea stagnalis*. The results illustrate the importance of developing embryo structure in determining the physical appearance of snail newborns, say the researchers.

Chirality or "handedness" is a property of those physical systems that cannot be superposed on their mirror images. This property crops up time and again throughout nature from the human hand to DNA to the spin of sub-atomic particles.

The spiral shells of snails are often used as a textbook example of biological structures that possess chirality. Shell-coiling is important because a snail's sexual organs are usually twisted and it is difficult for snails of opposite handedness to reproduce. In addition, the way a snail catches prey depends on the handedness of the micro-organism or plant. The handedness of a snail's shell is inherited from its mother but the gene that gives snail shells their chirality in the first place is yet to be identified.

In this latest research, Kurodo Reiko of the University of Tokyo and his colleagues investigated chirality in *Lymnaea stagnalis* – a large, air-breathing freshwater snail. They isolated a series of developing embryos that had already acquired a particular handedness – either "dextralized" (right-handed) or "sinistralized" (left-handed). By adding two glass nanorods to an 8-cell bundle they were able to alter its cleavage — the plains along which it sub-divides — to reverse its handedness. Nearly 78% (71 out of 91) of sinistral embryos were reversed to dextral, and 78% (67 out of 86) of dextral embryos were reversed to sinistral.

Reiko told *physicsworld.com* that he hopes this research will help his team to isolate the gene responsible for giving this snail its handedness. He hopes this knowledge could help researchers to shed light on some of the mystery that still surrounds chirality in nature. "In everyday life, the effects of medicinal drugs, agricultural chemicals and food sweeteners are all dependent on the handedness of their molecules," he said. "Even the origin of life can be explained from the point of chirality."

Henri Brunner, an inorganic chemist at the University of Regensburg, is impressed with the new research describing it as an "extremely

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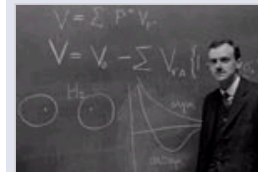
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interesting result". "Chirality is not only a basic concept for biology and chemistry but also for physics," he said.

This research is published in the latest edition of *Nature*.

About the author

James Dacey is a reporter for *physicsworld.com*

2 comments

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1 **flamencoprof** **Sophistication of approach**

Nov 27, 2009 10:03 AM
Waitakere City, New Zealand

This experiment is at about the level of drilling a hole in the side of a TV set(8-cell bundle), poking a wire in (adding two glass nanorods), and seriously reporting what angle of poke produced what effects. "Oh this is interesting, poking around near the lower area shuts down function" they say as the power supply is shorted.

The roots of chirality must be way deeper than this.

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2 **sloppyjourno** **Hard of hearing?**

Nov 30, 2009 3:54 AM

If the physics world journalist really spoke to Dr Reiko Kuroda, you would have thought he might have got the name right, and you would also have thought he would have noticed he was talking to a woman! Here she is: www.jst.go.jp...kkm_P.html

How much of the rest of the article is wrong?

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