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 - [Announcements](#)
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 - [Home](#)
 - [MobileModo](#)
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 - [Peripherals](#)
 - [Press](#)
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Magnetic Nanoparticles Can Remotely Control Worms

By [Jess McNally - Wired](#) on [July 8, 2010](#) at 2:40 PM



Using magnetic nanoparticles, scientists have found a way to remotely control neurons and affect animal behaviour.

The nanoparticles, which are targeted to attach to cell membranes, heat up when exposed to a magnetic field. Researchers have demonstrated that the heat can open calcium ion channels in cells, activate neurons and even cause *C. elegans* worms to recoil, according to a paper released in *Nature Nanotechnology* June 27.

“This research will help us unravel the signalling networks that control animal behaviour,” physicist Arnd Pralle of the University of Buffalo, co-author of the study, said in a press release July 6.

The work could also have applications in cancer treatments and diabetes therapies. If the nanoparticles can be

targeted to specific proteins or cells, it may be possible to kill cancer cells by overheating the cell wall, or to stimulate the pancreatic cells to release insulin. The method only affects cell walls, so patients wouldn't actually feel the heat.

"It would take forever to heat up [a] whole cell since it is cooled so well by all the water around it," Pralle said.

One of the major questions for using the technique in human applications is where the heat-sensitive ion channels are in the body. In the *C. elegans* worms, the researchers were able to target known ion channels that opened up at 34C, which caused the recoil response.

In humans, similar ion channels in fingers open up at 50C, which is what causes our fingers to jump back when we touch something too hot, but little is known about other places where this happens in the body.



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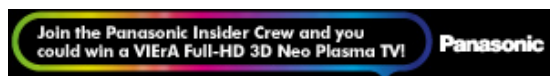


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