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R&D

The Mind's Mirror Doubles the Pain

By Susan Kruglinski

DISCOVER Vol. 25 No. 10 | October 2004 | Mind & Brain

People with injuries to one limb sometimes report pain at the exact same spot on the opposite side. Doctors have often attributed this to overuse of the healthy limb. Neurologist Anne Louise Oaklander at Massachusetts General Hospital has shown the cause is far weirder: Nerve damage on one side actually creates a matching injury on the other side of the body. After noticing mirror-image pain in her patients with shingles, Oaklander cut nerve bundles in the hind paws of rats to see what would happen. Within a day, about half the nerves in the equivalent part of the other paw died.

Mirror nerve injuries are so precise that Oaklander concludes they must result from a specific neuronal signal. "This is most likely a mechanism that operates in health," she says. "Perhaps it allows us to coordinate information coming from both sides of the body." Linda Watkins, a pain expert at the University of Colorado at Boulder, thinks this mechanism might be carried out by glial cells, poorly understood sister cells of neurons. Glial cells in the spine may activate when pain-related neurons are firing, dosing both limbs with inflammatory substances that may trigger an excitatory response but that may also be toxic to nerves. Supporting this idea, she found that mirror pain in rats vanished when glial cells were inactivated. She now hopes to collaborate with Oaklander to find out more. "Until recently people were reticent to tell their doctors. They thought they must be nuts," Oaklander says. "But my rats are not nuts."

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Print Resources:

Watkins, L. R., and S. F. Maier. "When Good Pain Turns Bad." *Current Directions in Psychological Science* 12 (2003): 232-236.

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