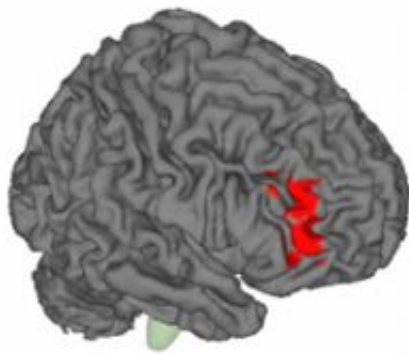


# Researchers Demonstrate How Placebo Effect Works in the Brain

July 30 2007

---



Pain pathways in motion in the brain during the placebo effect. Credit: Columbia University

Columbia University scientists, with colleagues from the University of Michigan, have shown how the neurochemistry of the placebo effect can relieve pain in humans. The scientists found that the placebo effect caused the brains of test volunteers to release more of a natural painkiller.

The placebo effect is an improvement in a medical condition caused by a patient's belief as opposed to actual treatment. Exactly how the positive expectations created by placebos translate into pain relief had been a mystery until now.

Understanding how placebo effects work may give scientists insight into why many drugs have a range of effects on people, how drugs and other treatments work together with psychological states, and how psychology can be effectively used in treatment.

The research team was led by Tor Wager, Columbia professor of psychology. “Placebo effects are often observed in clinical practice, but there have been relatively few scientific studies that document the kinds of diseases that can be influenced by placebo treatments and how the treatments work in the brain and body,” Wager said.

“Yet, placebo groups are included in virtually every major clinical trial, which is a testament to their importance. Only in the past few years have scientists developed the tools to directly investigate how placebos work in the human brain.”

In the experiment, scientists applied a placebo cream to volunteers’ forearms; volunteers were told it was a pain reliever, though the cream was not. Next, a control cream was applied to a nearby area, and subjects were told it had no effect. Researchers then placed a painfully hot stimulus (similar to a very hot cup of coffee) to both forearm areas and used positron emission tomography (PET) scans to measure and compare brain activity during each application. They found that the placebo treatment caused the brain to release more opioids, a chemical produced by the body and released by the brain, to relieve pain.

The scientists discovered that in the first area treated with a placebo, which volunteers falsely believed to have been treated with a pain reliever, opioid release occurred in brain areas associated with pain relief—in particular, the periaqueductal gray, an area in the brainstem used in neurosurgical interventions to control chronic pain. They also found opioid release in the orbitofrontal cortex and anterior cingulate, parts of the cerebral cortex thought to be related to evaluating and

orchestrating responses in the brain and body to deal with a perceived threat—producing, for example, the so-called flight-or-fight response.

“These results extend our knowledge of how beliefs and expectations affect the brain's neurochemistry and show that one's mental response to a challenge can affect the brain and body in ways that are relevant to health,” Wager explained. “Understanding these interactions can pave the way for new treatments that are informed by knowledge of mind-body interactions.”

Source: Columbia University

Citation: Researchers Demonstrate How Placebo Effect Works in the Brain (2007, July 30)  
retrieved 9 April 2024 from <https://medicalxpress.com/news/2007-07-placebo-effect-brain.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------