

Scientist Probes Promising Link Between Warmth, Better Moods

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(PhysOrg.com) -- The University of Colorado at Boulder scientist who discovered that playing in the dirt might ease depression is probing the link between higher temperatures and elevated mood.

Christopher Lowry sees relationships between both lines of inquiry -- researching the link between the immune system and the [neurotransmitter serotonin](#) and probing the link between [temperature](#) and serotonin.

The upshot is potentially significant. Understanding these mechanisms might help scientists craft better treatments for depression and other [mood disorders](#), he says.

Lowry, an assistant professor of integrative physiology, believes the area of research is promising. So does the National Science Foundation, which recently granted Lowry a \$500,000 Faculty Early Career Development Award, a prestigious honor also called the CAREER Award, to continue his study of the role of temperature in mood.

"Whether lying on the beach in the midday sun on a Caribbean island, grabbing a few minutes in the sauna or spa after work or sitting in a hot bath or Jacuzzi in the evening, we often associate feeling warm with a sense of relaxation and well-being," Lowry writes in a recent edition of the Journal of Psychopharmacology.

"Intuitively, we all understand that temperature affects our mood,"

Lowry said. But a link has not been clearly defined. "So that's what we're going after."

Virtually all [antidepressant drugs](#) activate the serotonin system. Lowry's research group noted studies from the 1970s showing that warming a small piece of skin in rats caused increased activity in an area of the brain with serotonin-producing neurons. "So then we had a potential pathway," he said.

Lowry's lab has been a world leader in demonstrating that there are different subpopulations of serotonin-producing neurons, some associated with anxiety, others with panic, immune activation and antidepressant-like effects.

And while scientists know that serotonin is related to mood, appetite and aggression, they don't know exactly how the substance is involved. The same is true of antidepressants such as Prozac and other selective serotonin reuptake inhibitors.

"It's a complete black box how these drugs work, which I think many people might find surprising," Lowry says. "We think that if we understood what makes these serotonin neurons different from other neurons that we would then be in a position to develop rational new therapies for treatment of [depression](#)."

Several clues suggest a connection between temperature and mood, he says. People who are depressed often experience altered temperature cycles. Virtually all antidepressants can cause sweating, a thermoregulatory cooling mechanism typically triggered when a person gets warm.

This system may be activated by exercise. When you exercise, body temperatures rise, and you sweat. "That very likely involves some of the

mechanisms that we're studying," Lowry says.

Several studies have shown that regular exercise has an antidepressant effect. "So they have studied exercise, but they haven't studied temperature change, which is a component of exercise."

Serotonin neurons can be activated by warm temperature externally, via the skin, and internally. The calming effect of body warmth seems to occur only up until the temperature becomes hazardous, around 104 degrees Fahrenheit. "So we think there's a link between the system that cools the body and a sense of relaxation."

Provided by University of Colorado at Boulder ([news](#) : [web](#))

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