

# 'Runner's high' may also strengthen hearts

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Endorphins and other morphine-like substances known as opioids, which are released during exercise, don't just make you feel good -- they may also protect you from heart attacks, according to University of Iowa researchers.

It has long been known that the so-called "runner's high" is caused by natural opioids that are released during exercise. However, a UI study, which is published in the online edition of the American Journal of Physiology's Heart and Circulatory Physiology, suggests that these opioids may also be responsible for some of exercise's cardiovascular benefits.

Working with rats, UI researchers showed that blocking the receptors that bind morphine, endorphins and other opioids eliminates the cardiovascular benefits of exercise. Moreover, the UI team showed that exercise was associated with increased expression of several genes involved in opioid pathways that appear to be critical in protecting the heart.

"This is the first evidence linking the natural opioids produced during exercise to the cardio-protective effects of exercise," said Eric Dickson, M.D., UI associate professor and head of emergency medicine in the Roy J. and Lucille A. Carver College of Medicine and the study's lead investigator. "We have known for a long time that exercise is great for the heart. This study helps us better understand why."

Studies have shown that regular vigorous exercise reduces the risk of

having a heart attack and improves survival rates following heart attack, even in people with cardiovascular disease. In addition, exercise also decreases the risk of atherosclerosis, stroke, osteoporosis and even depression. However, despite these proven health benefits, much less is understood about how exercise produces these benefits.

The UI study investigated the idea that the opioids produced by exercise might have a direct role in cardio-protection. The researchers compared rats that exercised with rats that did not. As expected, exercised rats sustained significantly less heart damage from a heart attack than non-exercised rats. The researchers then showed that blocking opioid receptors completely eliminated these cardio-protective effects in exercising rats, suggesting that opioids are responsible for some of the cardiac benefits of exercise.

The UI team also showed that exercise was associated with transient increases in expression of several opioid system genes in heart muscle, and changes in expression of other genes that are involved in inflammation and cell death. The researchers plan to investigate whether these altered gene expression patterns reveal specific cardio-protective pathways.

A better understanding of how exercise protects the heart may eventually allow scientists to harness these protective effects for patients with decreased mobility.

"Hopefully this study will move us closer to developing therapies that mimic the benefits of exercise," Dickson said. "It also serves as a reminder of how important it is to get out and exercise every day."

Source: University of Iowa

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