

# Massage May Accelerate Healing

Benefits include tissue repair and reduced inflammation

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By Nathan Seppa

The relief that comes from rubbing sore muscles seems to have tangible roots: Researchers have found clear molecular signs that overworked muscle cells respond to being manipulated by massage. There are measurable decreases in inflammatory compounds in massaged muscle tissue and indications that muscle cells rev up their energy processors for the inevitable repairs that follow hard exercise, a U.S.-Canadian team reports in the Feb. 1 *Science Translational Medicine*

"This is the best data I've ever seen addressing possible mechanisms by which this therapy works," says Thomas Best, a sports medicine physician at the Ohio State University School of Medicine Justin Crane, a kinesiologist at McMaster University in Hamilton, Ontario, and his colleagues recruited 11 active men to participate in a workout that taxed their quadriceps, the muscles at the front of the thigh. Shortly afterward, one thigh on each volunteer received a 10-minute massage and the other didn't. The researchers took muscle biopsies from both legs of each volunteer right after the massage and again 2.5 hours later.

The biopsies taken immediately after massage showed that muscles in the massaged legs, but not in the untreated ones, had reduced levels of an inflammatory protein called tumor necrosis factor-alpha. The biopsies also revealed activation of two kinds of enzymes called kinases right after the massage.

Massaged-leg biopsies taken 2.5 hours later showed reduced levels of interleukin-6, a different inflammatory protein, and elevated concentrations of a multi-purpose compound called PGC1-alpha. PGC1-alpha plays roles in muscle fiber maintenance and cell metabolism.

The analysis also hinted that muscle cells in the massaged legs were setting the stage for growth of mitochondria, the energy factories in cells.

Massage and other alternative therapies have doubters in part because studies of these techniques often measure benefits subjectively or lack biological evidence of an effect, the authors note.

"I'm more convinced now that massage is effective," Crane says. "We see inflammation going down and, conversely, other cell signaling going up - two facets of rehab going the right directions."