

# **Just the expectation of a mirthful laughter experience boosts endorphins 27 percent, HGH 87 percent**

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There's no doubt that laughter feels good, but is there real neurophysiology behind it and what can you do about it? In a paper being presented in an American Physiological Society session at Experimental Biology 2006, Lee S. Berk of Loma Linda University, reports that not only is there real science and psychophysiology, but just the anticipation of the "mirthful laughter" involved in watching your favorite funny movie has some very surprising and significant neuroendocrine/hormone effects.

According to Berk: "The blood drawn from experimental subjects just before they watched the video had 27% more beta-endorphins and 87% more human growth hormone, compared to blood from the control group, which didn't anticipate the watching of a humorous video. Between blood pulls, the control group stayed in a waiting room and could choose from a wide variety of magazines," he explained.

## **HGH, endorphin difference is long-lasting; setting the baseline and environment is key**

Berk said that the strong difference between the two groups in terms of human growth hormone (HGH) and beta-endorphin blood levels was maintained from just prior to the beginning of video watching, throughout the hour of viewing and afterwards, also.

"We believe the results suggest that the anticipation of a humor/laughter eustress (positive stress) event initiates changes in neuroendocrine response prior to the onset of the event itself," Berk said. "From our prior studies, this modulation appears to be concomitant with mood state changes, and taken together, these would appear to carry important, positive implications for wellness, disease-prevention and most certainly stress-reduction," he noted.

In the current experiment, Berk and his colleagues studied 16 healthy and fasting males, who hadn't exercised for at least a day and were not taking supplement medications. The test subjects had chosen a favorite video. Three days before the experiment, all the subjects were told which group they were randomly selected to be in, experimental (video watching) or control (no video watching). All subjects had blood drawn just before the video watching experiment began (baseline), four times during the hour-long experiment, and three times afterward.

"One of the keys in this kind of experiment is to set the baseline and control environment carefully," Berk said. "In this case, the control group basically sits in a 'neutral' room waiting to have their blood drawn, and on the tables there is a wide variety of magazines that they can browse, because you don't want to bias what they do or watch. Time and behavior have proved me right with this approach," he added.

## **Earlier experiments showed stress reduction**

Berk said the results of this "anticipatory mirthful laughter experience, which is a kind of eustress or 'positive/good stress' event, builds on our earlier work and may constitute a real construct for what is the 'biology of hope.'" Earlier experiments showed that viewing a favorite funny video can offset symptoms of chronic stress, which can suppress various components of the immune responses, particularly those related to anti-viral and anti-tumor defenses. In addition, there appears to be a

rebalancing of the Th1/Th2 immune response which suggestively could lead to reduction of autoimmune issues.

"Mirthful laughter diminishes the secretion of cortisol and epinephrine, while enhancing immune reactivity. In addition, mirthful laughter boosts secretion of growth hormone, an enhancer of these same key immune responses. The physiological effects of a single one-hour session viewing a humorous video has appeared to last up to 12 to 24 hours in some individuals," Berk noted, " while other studies of daily 30-minute exposure produces profound and long-lasting changes in these measures.

### **Next steps to seek physiological linkage mechanisms**

In addition, Berk noted: "An area we will pursue is the modulation and change in Th1 and Th2 cytokine and inflammatory immune responses to the anticipation and experience of the positive mood state changes associated with mirthful laughter."

Future research in this area with more subjects "needs to elaborate these findings in psychoneuroimmunology understanding and the mechanism linkage modulation between anticipatory positive behaviors and neuroendocrine and immune responses," Berk said. "It may sound corny but we in the health care medical sciences need to 'get serious about happiness' and the lifestyle that produces it, relative to mind, body and spirit and its biotranslation," he added.

"Why do you think Reader's Digest has claimed that 'Laughter is the Best Medicine' for so many years?" Berk concludes.

Source: American Physiological Society

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