

Spirituality and Stress: Differential Cleaving Of POMC (Proopiomelanocortin)

This slide shows the relationship between spirituality and the way our brains respond to stressful influences.

Stressors stimulate neurons in the brain to activate a gene, which produces the neurochemical, proopiomelanocortin. POMC is a precursor to ACTH/Cortisol, a stress-related hormone. Cortisol prepares the individual for fight or flight. It causes our heart rate, breathing rate and blood pressure to go up. However, our thinking processes slow down because the blood flow in our brain is restricted. Conversely, the capillaries in our arms and legs are dilated increasing the blood flow to the large muscles there.

Ironically, POMC is also the precursor to beta-endorphin, which produces pharmacologic effects similar to opiates. As a powerful analgesic, Beta-endorphin acts throughout the nervous systems to reduce pain. When released Beta-endorphin can also contribute to a sense of peace and calm.

So what determines the differential cleaving of proopiomelanocortin? In other words, what determines whether POMC cleaves into Cortisol or Beta-endorphin? Significantly, the determining influence is instructions from the frontal lobe, the thinking and perceiving center of the brain.

Simply stated, when people interpret an experience as threatening, a specific message goes to the pituitary, which then produces ACTH/Cortisol. On the other hand, if the brain perceives the experience as supportive, the pituitary produces beta-endorphin. This means that our perceptions make all the difference in how our body responds to stressors. And, significantly, spirituality affects our perceptions.