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Brain study links negative emotions and lowered immunity

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Brain activity linking negative emotions to a lower immune response against disease has been revealed for the first time, claim researchers.

Many previous studies have shown that emotions and stress can adversely affect the immune system. But this effect had not been directly correlated with activity in the brain, says study leader Richard Davidson, at the University of Wisconsin, Madison, in the US.

The part of the brain the team studied, the prefrontal cortex (PFC), is associated with depression. People who had the greatest activity in the right PFC when asked to dwell on distressing episodes in their life had a markedly lower antibody levels after an influenza vaccination. In contrast, those showing exceptional activity in the left PFC when recalling happy times developed high antibody levels.

Davidson says emotions play an important role in regulating systems in the body that influence health. "This study establishes that people with a pattern of brain activity that has been associated with positive [emotions] are also the ones to show the best response to the flu vaccine."

"It begins to suggest a mechanism for why subjects with a more positive emotional disposition may be healthier," he says. Janice Kiecolt-Glaser, an expert on stress and immunity at Ohio State University, told the *New York Times* that the study represents "some of the best evidence we've seen to date."

Intense sadness

Davidson, with colleagues at Wisconsin and Princeton University, New Jersey, asked 52 men and women who graduated from Wisconsin in 1957 to recount both the best and worst events in their lives on paper.

For their best experiences, the subjects were asked to write about an event where they experienced "intense happiness or joy". And for their worst experience they were asked to remember an event causing "the most intense sadness, fear, or anger".

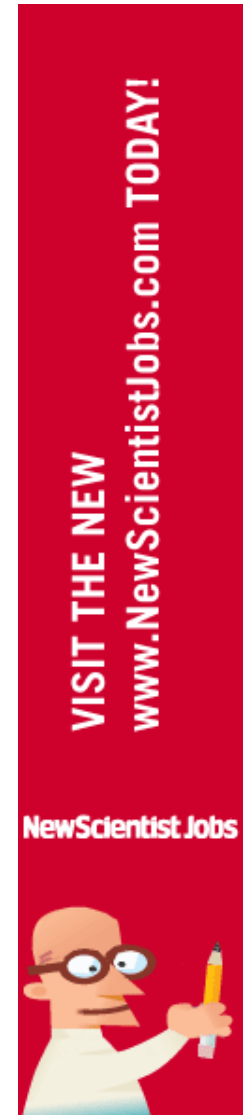
During this autobiographical task, the electrical activity of the brain was measured. The subjects were then given flu shots and their antibody levels were measured after two weeks, four weeks and six months. The researcher found a clear link between strong activity in the left PFC and a large rise in antibodies, and vice versa. (*Proceedings of the National Academy of Sciences*, DOI: 10.1073/pnas.1534743100).

However, the study could not explain exactly how having a positive attitude boosts the immune system. The researchers say some evidence exists to suggest a link between the PFC and the immune system via a complex hormonal system governed by the hypothalamic, pituitary and adrenal glands.

Another study by Italian and UK researchers, also published on Monday, reveals that depressed elderly people have fewer lymphocytes and T-cells - white blood cells crucial for fighting disease. This study is published in *Psychotherapy and Psychosomatics* (vol 72, p 253)

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