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Dearborn Station 47 W. Polk St., Suite M-5 Chicago, IL 60605
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Stress and Fear Can Affect Cancer's Recurrence

ScienceDaily (Feb. 27, 2008) — A scientist shows that mind may indeed affect matter. After the surgical removal of a malignant tumor, the chance that cancer will re-appear in a different location of the body remains high. But new research from Tel Aviv University, in a bold new field called psychoneuroimmunology, may prevent those cancer cells from taking root again -- and the key to the treatment is stress reduction.

A new study led by Prof. Shamgar Ben-Eliyahu, from Tel Aviv University's Department of Psychology, has shown scientifically that psychological and physiological stress prior to, during and after surgery has a biological impact that impairs immune system functioning. This impairment bears down on disease progression, he says, especially at the critical point during oncological surgery when a primary tumor is being removed.

The results are expected to influence cancer intervention programs in the future.

Effects of Fear

"The psychological stressors of surgery deal a blow to the immune system, but this is hardly discussed in the medical community," says Prof. Ben-Eliyahu. "Ours is among the first studies to show that psychological fear may be no less important than real physiological tissue damage in suppressing immune competence."

The surprising part of Prof. Ben-Eliyahu's studies is that stress hormones such as adrenaline, which are released before and during surgery, "underlie much of the devastating effects of surgery on immune competence," says Prof. Ben-Eliyahu.

Until now, doctors assumed that the immune system was weakened due to tissue damage and the body's responses to it. A weak immune system is one of the major factors that promotes cancer metastases after an operation, explains Prof. Ben-Eliyahu.

"Timing is everything after cancer surgery," says Prof. Ben-Eliyahu. "There is a short window of opportunity, about a week after surgery, when the immune system needs to be functioning maximally in order to kill the tiny remaining bits of tumor tissue that are scattered around the body."

An Early Boost

The main stress hormones that appear to have an impact on immune competence are released before and during surgery, Prof. Ben-Eliyahu has found. He is currently

developing a novel intervention program, based on existing generic drugs, to block the influence of these hormones.

Pre-clinical studies in a 2005 study also published in *Brain, Behaviour, and Immunity* reveal that by blocking these stress hormones, cancer metastases in animal models could be reduced. In a recent study (in progress), Prof. Ben-Eliyahu also found that by blocking these hormones, he could increase long-term post-operative survival rates from cancer in animal models, by as much as 200-300 percent.

Prof. Ben-Eliyahu and his students are now also trying to integrate stimulation of the immune system just before surgery and prevent its suppression. This may provide the immune system with an opportunity to eradicate cancer residuals after the surgical removal of the primary tumor, and before these residuals are re-established and become resistant to immunity, he says.

Prof. Ben-Eliyahu concludes, "By boosting the immune system and blocking its suppression by psychological and physiological stress, starting a day or two before surgery, during surgery and after surgery, we may be able to provide an intervention program that can extend people's lives and potentially increase their chances for long-term survival."

Prof. Ben-Eliyahu is one of about 200 other scientists working in the novel and emerging field of psychoneuroimmunology. It is an interdisciplinary study of the interaction between the psychological processes of the brain, and the nervous and immune systems of the human body. In this field, Prof. Ben-Eliyahu collaborates regularly with Prof. Gayle Page from the Johns Hopkins School of Nursing and other scientists from the United States and Israel. His work is supported by the U.S. National Institute of Health.

The study was published in the journal *Brain, Behaviour, and Immunity* (2007).