Serotonin Made in Breast Cancer Cells, Researchers Show

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Nelson Horseman, PhD

(PhysOrg.com) -- Researchers at the University of Cincinnati have documented that the brain hormone serotonin is made in human breast cancer cells and functions abnormally, contributing to malignant growth.

Researchers in the lab of Nelson Horseman, PhD, a professor in the department of molecular and cellular physiology, published their findings this month in *Breast Cancer Research*, a peer-reviewed online journal. The study represents the first report of direct involvement of serotonin in human breast cancer.

Horseman's team has previously shown that serotonin, a neurotransmitter best known for its involvement in mood regulation, plays a role in mammary gland development. Armed with that knowledge, researchers analyzed human breast tumors from patients and in a laboratory setting to determine if serotonin played a role in breast cancer.

In a normal mammary gland, serotonin acts as a physiological regulator of lactation and involution (shrinkage of the milk-making system when it's not needed), in part by favoring growth arrest and cell death. Researchers found that the serotonin system was subverted in two important ways in human breast cancers.

"First, the amount of serotonin that the breast cancer cells synthesize changes abnormally," Horseman says. "And second, breast cancer cells have receptors for serotonin that are different from normal breast cells, so they receive the serotonin signal in a different way—and that contributes to abnormal growth."

The findings open a possible new avenue for diagnosis and prognosis of human breast cancer, Horseman says, and could provide valuable new therapeutic targets for managing the disease, the second-leading cause of cancer death (behind only lung cancer) among American women.

Horseman points out that a number of drugs are in use that affect serotonin levels, including selective serotonin reuptake inhibitors (SSRIs) such as the antidepressants Prozac, Zoloft and Paxil. Further study is needed, he says, to explore their potential anti-cancer benefits.

Provided by University of Cincinnati (news : web)

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