

# Study identifies new protection mechanism in breast cancer

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Researchers at Karolinska Institutet in Sweden have identified a protein that protects against breast tumor growth and that can be linked to a better prognosis in breast cancer patients. The results, which are

published in the journal *Nature Communications*, may contribute to the development of new therapies for difficult-to-treat forms of breast cancer.

Breast [cancer](#) affects about 10% of women during their lifetime and is a major medical and societal burden. Fewer [treatment options](#) are available for ER-negative breast cancers, which lack estrogen receptors (ER) and thus do not respond to [hormone therapy](#). Particularly difficult to treat are so-called triple-negative breast cancers, which lack not only ER but also the [progesterone receptor](#) and HER2 receptor.

"Identification of new molecular mechanisms that regulate the growth of ER-negative breast cancer is warranted, as these mechanisms may represent novel therapeutic targets," says Per Uhlén, professor at the Department of Medical Biochemistry and Biophysics, Karolinska Institutet.

Professor Uhlén and colleagues have identified a novel mechanism by which the ubiquitous protein GIT1 regulates so-called Notch signaling, affecting the initiation and growth of ER-negative breast cancer.

### **Associated with better prognosis**

Studies of [tumor cells](#) from [breast cancer patients](#) showed that high levels of GIT1 inhibited Notch signaling and protected against tumor growth, while low levels of GIT1 enhanced tumor growth. ER-negative breast tumors from patients had lower levels of GIT1 than ER-positive breast tumors. The results also showed that ER-negative breast cancer patients with high levels of GIT1 have a better prognosis than those with low levels.

Notch signaling is an evolutionarily conserved cell-cell communication mechanism that has been shown to regulate cell fate decisions in most

organs of the body and at different steps during cell development. Overactive Notch signaling in breast cancer patients has previously been linked to a worse prognosis.

"Our results provide important information about a mechanism that controls the initiation and growth of breast tumors," says Professor Uhlén. "We hope that these findings will inform the development of new therapies for patients with difficult-to-treat [breast](#) cancer."

### **Collaboration with the clinic**

His research group is actively collaborating with clinicians treating patients with cancer to focus on research topics that are crucial for the treatment of patients.

"We want to conduct research that can benefit patients with severe diseases," says Professor Uhlén. "At Karolinska Institutet, we have state-of-the-art tools and equipment that can push the development of new therapies."

**More information:** Songbai Zhang et al, GIT1 protects against breast cancer growth through negative regulation of Notch, *Nature Communications* (2022). [DOI: 10.1038/s41467-022-28631-y](https://doi.org/10.1038/s41467-022-28631-y)

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