

Mutations of immune system found in breast cancers

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Mutations in the genes that defend the body against cancer-related viruses and other infections may play a larger role in breast cancer than previously thought, according to a study at the University of Illinois at Chicago.

Bernard Friedenson, associate professor of biochemistry and [molecular genetics](#) at UIC, looked at the DNA sequences of breast cancers from 21 different women and found mutations in [genes](#) involved in immunity in every one of them. The mutations were different in each of the breast cancers he analyzed, but all the mutations would have affected some aspect of pathogen recognition and defense, especially against viruses, Friedenson said.

His results are published in the November issue of *Functional & Integrative Genomics*.

The finding suggests that mutations affecting the immune system play an important role in the development of [breast cancer](#), contrary to the prevailing notion that mutations in the genes that regulate cell division are primarily responsible. Viruses such as human papilloma virus, which can cause cervical cancer, and Epstein-Barr virus, which can cause certain lymphomas, have also been implicated in breast cancer.

"Almost every human being is infected with one or more of these viruses, but most people never develop symptoms, much less breast cancer," Friedenson said.

Friedenson thinks that cancer-related viruses that are normally harmless can become dangerous if genes involved in immunity are mutated, either through heredity or environmental causes.

He identified gene mutations in breast cancer cells that affect their ability to recognize viruses, including some [mutations](#) that would be expected to significantly increase the cells' vulnerability to viruses implicated in breast cancer.

"If we know which genes are damaged in a breast cancer patient's immune system, prevention or even therapy can be tailored by giving vaccines or perhaps antiviral drugs to reduce the chances of recurrence," said Friedenson. "Sequencing the genomes of individual breast cancers now costs about \$2,000, and the cost continues to fall. This information could help physicians prescribe more targeted and effective treatments."

Provided by University of Illinois at Chicago

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