

A new target in the fight against breast cancer

Cancer cells differ from normal cells in many ways, including their abnormal growth and their ability to change shape and migrate to other tissues. These differences are partly caused by changes in the production of proteins and gene expression that occur when cancer cells transform from benign to malignant states. Two proteins found only in malignant breast cancer are α -synuclein and phospholipase C γ 2 (PLC γ 2). α -Synuclein is small protein found at high concentrations almost exclusively in neurons but the function that it plays in these cells is unknown. In contrast, PLC γ 2 is found mostly in blood-related cells where it plays important role in changes in cell growth and movement. Interestingly, neither of these proteins are found in normal breast tissue, but they both appear when normal breast cells transform into cancerous states. In fact, the more aggressive the state of cancer, the higher the levels of these proteins.

In the study performed by Yerramilli and Scarlata, using cells that correspond to an aggressive form of breast cancer cells, PLC γ 2 and α -synuclein are both present at high levels and they associate with each other to form a complex that has different properties than the individual proteins. They also found that α -synuclein protects PLC γ 2 from its normal degradation and so as the level of α -synuclein increases, so does that of PLC γ 2, and so does the complex. The new properties of the α -synuclein-PLC γ 2 complex promotes cell growth, division, cell migration and alters cells shape. In other words, the cells become stronger cancer cells. Although further work is needed, the studies presented in Yerramilli and Scarlata provide evidence that α -synuclein - PLC γ 2 interaction can be targeted as a therapy against breast cancer.

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[The breast cancer susceptibility gene product \(\$\alpha\$ -synuclein\) alters cell behavior through its interaction with phospholipase C \$\gamma\$ 2.](#)

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