CADN1 impedes abiotic apoptosis in breast cancer. New study results may indicate relationship between the protein and tumorigenesis.

Authors: Eric Jackson Joan Harris Kevin Glover Jeffrey Little Morgan Bowers

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California State University-Northridge

School of Environmental Studies

As discussed in a recent article in the journal Breast Cancer Research, and as discussed in previous articles, there has been focus on proteins for the inhibition of breast cancer as anti-cancer agents. However, this focus on protein inhibitors was found to be limited to parts of the protein.

As is well known, many different types of proteins are involved in the regulation of the cell cycle such as macrophages, UBC researchers went beyond that and looked at one component of a protein called cADN1. (Macrophages are cells that are engaged in the response to damage to the cell and disseminated elsewhere on the cell.) The protein cADN1 is specific to this cell cycle activation period. In this preclinical study, the presence of cADN1, inhibited apoptosis in human cells of in breast cancer

Their article: â€œCADinhibitor cADN1 significantly decreases the apoptosis rate in breast cancer cells,â€ would indicate that the inhibition of a protein at the time of cell death could be quite important.

In this new study, the first author, Hideki Sakahira (or the 6 of us, researchers of Okimoto Laboratory) and colleagues led by Shigekazu Nagata and associated with me, took samples from 14 breast cancer cell lines at Okimoto Laboratory and tried to determine which proteins of the genes we found â€œactiveâ€ as ACT signals within the tumor cells and which genes were â€œdestroyedâ€ by cADN1. This finding was made in the colon of about 3â€ by approximately 3-4â€ cm in a mouse xenograft model. They looked at two major components of cADN1. One of the components is called â€œanalogsâ€ and the other is called â€œdysfibril.â€

In this study, the scientists looked for standard characteristics of apoptosis â€œcyclesâ€, activating the cellular machinery to initiate apoptosis. Within the cancerous cells, normal cells were more â€œsilentâ€ while the cancers were more active.

In other words, it is the oxidative stress-disturbance effect of cADN1 that inhibits the apoptosis of the cancerous cells. Thus, it was the correlation between the disruption of apoptosis via cADN1 and the expression of protein or enzyme â€œsignaturesâ€ of the genes that are involved in stress response and mobilization (low pH, a state that our cells often display when stress is present). These novel insights opened up a new research direction. â€œCAD1 is an important protein that we need to look at seriously for controlling cell cycle activity in cancer cells,â€ said Sakahira.

Since the connection of CADN1 to survival of cancerous cells was established, it is now relevant to investigate whether other proteins of the protein might similarly affect the free-radical and oxidant state of the cells, in different cancers. Now that cADN1 is shown to facilitate apoptosis in breast cancer cells, Nagata stated, â€œWe now need to understand what the drugs that inhibit cADN1 would do in normal tissues. Our expertise in cloning, as well as cellular differentiation and cell division, is valuable in this process.â€

This collaborative work is significant for several reasons. First, in terms of the protein engineering as well as the study of mutation. Mutations to the cADN1 are already included in normal cells. Second, it is a model system study. It allows us to carefully evaluate the effects of interrupting cADN1 on the cells of breast cancer tissue. Third, it demonstrates that epigenetic alterations alone are insufficient for us to infer the mechanisms of how a protein may work in the modulated pathways of cancer cells. It is true that many different â€œRNA-basedâ€ drugs inhibit apoptosis. We need more information to identify the most effective therapies to target specific genes in cancer.

The collaborations and collaborative research were provided by the three members of the Okimoto lab, Didier Laurent, Lauren Gordon, and Takahito Ichikawa, as well as by Nagata, Robert Kanetsu and Takami Kato.

Note: Anatomy publications are eligible for publication through a two-stage verification process. Starting now, the RNA sequences of these studies are available to the public in a free online repository called Stem Cell Labeling and Functional Arrangements. RNA sequence details of the referenced publications can be found at http://www.stemcellsciences...-â€¦.

A Close Up Of A Fire Hydrant Near A Tree