Transporter could help breast cancer cells commit suicide

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Medical College of Georgia researchers are trying to open a door for a killer that breast cancer cells shut out. Pyruvate is a metabolite in the blood that is lethal to rapidly-multiplying cells, like cancer, and transporters bring substances like pyruvate inside cells. Since breast cancer cells won't allow pyruvate in, MCG researchers (L to R) Drs. Thangaraju Muthusamy and Vadivel Ganapathy looked to a healthy group of rapidly-dividing breast cells that do let in a similar killer.Credit: Medical College of Georgia

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"If we can figure out how to do that, we could have a new therapeutic target for fighting breast cancer," says Dr. Thangaraju Muthusamy,

assistant professor of biochemistry and molecular biology in the Medical College of Georgia School of Medicine.

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For breastfeeding, breast tissue must increase in size to allow milk production, says Dr. Vadivel Ganapathy, chair of the Department of Biochemistry and Molecular Biology in the School of Medicine. When breast-feeding stops, milk accumulates, and butyrate, a short-chain fatty acid similar to pyruvate, starts getting inside the cells. Breast size is reduced and lactation is halted via this process known as involution.

"The normal expansion of breast tissue during lactation is similar to breast cancer when tumors grow and multiply," Dr. Muthusamy says. "But the cell death that occurs in normal breast tissue during involution does not occur in breast cancer. Tumor cells are smart; they silence the transporter to avoid death. No transporter means no pyruvate is getting into the cells."

With new grants from the Department of Defense and the National Cancer Institute totaling $2.3 million, researchers will try to force cancer cells to express the transporter and open the door for pyruvate.

Source: Medical College of Georgia