# Breast milk may provide a personalized screen of breast cancer risk

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Breast cancer risk can be assessed by examining the epithelial cells found in breast milk, according to preliminary study results presented at the AACR 102nd Annual Meeting 2011, held April 2-6.

This screening method has the potential to provide a personalized assessment of breast cancer risk, said lead researcher Kathleen F. Arcaro, Ph.D., associate professor of veterinary and animal sciences at the University of Massachusetts Amherst. Given that roughly 80 percent of women give birth, this screen would also cover a large percentage of the female population.

Arcaro and colleagues collected breast milk samples from about 250 women who were scheduled for or who had a breast biopsy. The women submitted fresh samples, which were processed within 24 hours of expression; they provided samples from both breasts.

The researchers recruited about 90 percent of their study population from the Love/Avon Army of Women, which registers women who are willing to participate in breast cancer research. The American Association for Cancer Research is the scientific partner in this effort.

Once researchers received the samples, they isolated the epithelial cells (the potentially cancerous cells) in the breast milk. Then they isolated the DNA to look for epigenetic signals (attachment of methyl groups to DNA), which are the signals that tell the body those genes that should be expressed. These signals were then compared with breast cancer risk

assessed using the biopsy results.

Arcaro and colleagues analyzed three genes: RASSF1, GSTP1 and SFRP1. "More than 35 genes have been shown to be methylated in breast cancer," she said.

Of the 104 women with a non-proliferative (low-risk) lesion, results showed no difference in the average epithelial DNA methylation of their biopsied breast vs. non-biopsied breast for RASSF1 and GSTP1. For SFRP1, however, the average methylation was higher in the biopsied breast. Importantly, among the women whose biopsies revealed cancer, there was a significant increase in average RASSF1 methylation in the biopsied breast vs. non-biopsied breast. Although the sample size in this study is small, "it's sufficient to tell us that we can use the cells in breast milk to assess breast cancer risk," Arcaro said, and additional studies are needed to expand the number of genes. Long-term studies are currently underway with about 80 percent of the original participants enrolled in follow-up.

Arcaro hopes that someday every woman who delivers a baby in a hospital will be screened for breast cancer via breast milk. "We'll take a little sample of colostrum, and we'll tell her how her breasts are doing," she said. "It's totally noninvasive, potentially inexpensive and really accurate."

Provided by American Association for Cancer Research