

# The Women's Times

REPRINT

BY AUDREY MANRING

## Local Research

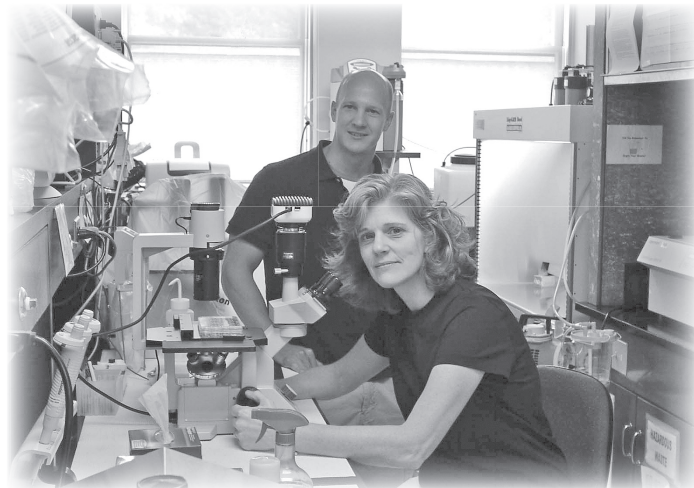
BREAST CANCER WORKING GROUP

Important breast cancer research is being done here in Western Massachusetts. The Breast Cancer Working Group is an innovative three-year-old effort that facilitates collaboration between scientists from UMass/Amherst and physicians at Baystate Medical Center. The resulting “laboratory-to-clinic” research model helps translate scientific discoveries into practical treatments and preventative therapies for breast cancer.

The head of the breast cancer group is D. Joseph Jerry, a breast cancer researcher and associate professor of veterinary and animal sciences at UMass. His work focuses on the cellular basis for susceptibility to breast cancer. The causes or triggers of breast cancer are mostly unknown, he says. “About 10 percent of cases involve genes like BRCA-1 and BRCA-2 that clearly elevate a women’s risk of breast cancer,” he says. “It’s estimated that another 20 percent of cases have a genetic component—but the alleles [versions of a gene] aren’t known.” Nor is it known how strongly these other genetic components correlate to breast cancer, or how they interact with environmental factors (e.g., toxins).

Jerry and others are examining cells from very early “atypia stage” breast tumors, which may or may not be cancerous, in an attempt to identify cellular characteristics or “biomarkers” that spell trouble ahead. Doing so would allow for greater precision in treatment. “Two-thirds of women with in situ breast cancer [where the cancer hasn’t spread] probably don’t need the extremely aggressive treatments they’re getting,” he says. “The problem is, we don’t know who those two-thirds are, or how to distinguish them from the one-third that absolutely need that treatment,” he says. Figuring out what different biomarkers mean for the future course of a tumor would help women better calculate their level of risk and help physicians calibrate the type and level of treatment.

Jerry’s colleague and fellow Breast Cancer Working Group member, Kathleen Arcaro, an assistant professor at the UMass environmental sciences program, is focused on a different piece of the cellular puzzle. Her research involves



Kathleen Arcaro and Joseph Gozgit

the emerging field of “epigenetics,” the study of certain types of changes in our DNA that accrue over our lifetimes and are affected by our environment. These changes are directly correlated with cancer and other diseases. Breast cancer is associated with a particular epigenetic process called “hypermethylation,” which can produce changes in the cells lining the breast ducts. Hypermethylation occurs as a result of lifestyle and environmental exposures, and its effects tend to be more marked with age. Certain patterns of hypermethylation will likely be found to correlate with breast cancer. “Detecting those patterns could serve as an early screen for breast cancer,” says Arcaro.

Her current research involves examining breast duct cells to study hypermethylation. She’s extracting the cells from samples of breast milk donated by women in Western Mass. (Women can take part in the study by calling Arcaro’s lab at 413-577-1823.) She will compare the hypermethylation of older and younger women, and will also explore possible relationships between hypermethylation and various environmental toxins, whose presence she’ll detect through a chemical analysis of the breast milk samples. In a second stage of the research, Arcaro will contrast the hypermethylation of normal, healthy breast cells with those of women who have breast cancer. Identifying patterns associated with breast cancer will help her eventually develop an early detection screen. Given that demethylating drugs are in clinical trial, such a screen has the potential to give women empowering information about their breast cancer risk.