

# Breast Cancer and Body Rhythms

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Could working the night shift alter a woman's body clock enough to cause breast cancer?

"One minute you're a healthy person, the next minute you have [breast cancer](#)."

Ettamay (last name withheld) is up early these days. She lives a much different life than she did when she was a nurse working the night shifts. She would be just getting to sleep at this early morning hour.

"I was always exhausted," she says. "I don't know any of the nurses, especially the night shift gals, that weren't exhausted all the time."

She wonders if her crazy work schedule might have contributed to her breast cancer.

Virginia Tech molecular biologist Carla Finkelstein says studies back up Ettamay's suspicions. "There are a number of epidemiological studies that show women working night shifts have a higher incidence of breast cancer," she says.

Finkelstein is studying this question microscopically, one cell at a time. She wants to know the impact of night-shift work on a woman's physiology. Can working odd hours actually alter a woman's body chemistry--turning healthy cells into cancer cells?

"What we're trying to understand is how changes in environmental conditions influence the expression of genes that regulate cell division," explains Finkielstein.

With support from the National Science Foundation (NSF), Finkielstein uses frog embryos to help figure out on a molecular basis the physiological changes in women who work the [night shift](#). She says studies show that working "night owls" have abnormal levels of specific proteins in their cells, which act by turning on and off genes that regulate how cells grow and divide. Finkielstein injects some of the molecules into frog cells to study their effects.

"... And that could end up in cancer," she explains. "It could end up in very many other diseases. But in our studies we believe that it ends up in an abnormal proliferation of cells."

The Virginia Tech researcher also studies the role a woman's [body clock](#) plays in treating the disease. Using human cancer cells, many donated by women with breast cancer, Finkielstein tests whether radiation therapy is more effective when given at certain times of the day.

"So people who actually have the disease might one day receive treatments at times that make the medicine more effective and, therefore, reduce the impact of the disease and, most likely, the secondary effects on the person," she adds.

Recently, Finkielstein received additional NSF funding via the American Recovery and Reinvestment Act of 2009 (ARRA). She says the new funding has been critical to her continuing the research.

While she is hard at work, breast cancer survivors keep in touch and support her efforts. They, too, want to understand the connection between breast cancer and a woman's body clock to not only help

prevent the onslaught of breast cancer but to better treat the disease.

"We are the face of breast cancer," says Vernal Branch, advocacy constituency coordinator for the Virginia Breast Cancer Foundation and a breast cancer survivor. She says cancer survivors are up against another clock.

"I don't know if there's any way that I can protect my grandchildren or my nieces from getting this disease, but that's what I'd like to do," she says. "I would like to see no woman die from breast cancer."

"I have two daughters, three granddaughters, I don't want them to get it," says Ettamay.

Finkelstein agrees. "So I hope that, in 10 years from now, you're not interviewing me about breast cancer, but we can talk about something else."

Provided by National Science Foundation

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