Does smoking avert some breast cancers?

First things first. Smoking remains a bad idea.

That's the message from researchers who have found that cigarette smoking may limit the incidence of breast cancer in women who carry a genetic mutation that predisposes them to the malignancy.

Having a mutation in either the *BRCA-1* or *BRCA-2* gene has been shown to increase sharply a woman's risk of breast cancer. In the new study, Canadian and U.S. researchers found that of 186 breast cancer patients with a *BRCA* mutation, 39 percent had smoked cigarettes at some point in their lives. Of 186 women with a *BRCA* mutation but no breast cancer, 52 percent had smoked, the researchers report in the May 20 JOURNAL OF THE NATIONAL CANCER INSTITUTE.

The women averaged 50 years old. Researchers obtained blood or tissue from all of them to ascertain their *BRCA* status and gathered data on their lifestyles from a questionnaire.

This potential benefit of smoking does not come as a total surprise, says study coauthor Timothy R. Rebbeck, a genetic epidemiologist at the University of Pennsylvania School of Medicine in Philadelphia. Although past research has shown no clear indication that cigarettes either suppress or exacerbate breast cancer, scientists suspect that smoking depresses concentrations of estrogen, the hormone linked to breast cancer, he says. Smoking appears to contribute to early menopause and osteoporosis, which are associated with low estrogen concentrations, and to a reduced rate of cancer of the uterine lining.

Perhaps women who carry a mutation in one of the *BRCA* genes are more sensitive to estrogen and thus at greater risk of breast cancer than women who don't, Rebbeck suggests. Research has shown that the incidence of breast cancer in women with a *BRCA* mutation rises sharply until 45, then less abruptly afterward. In women without the mutation, breast cancer risk tends to rise more consistently with age. Because estrogen is present in greater quantities before menopause, it may play an enhanced role in the *BRCA*-related cancers.

If so, lowering the concentrations of estrogen circulating in the body might give women with the mutation an advantage they wouldn't otherwise have, he says.

"This is fairly impressive," says Barbara S. Hulka, an epidemiologist at the University of North Carolina at Chapel Hill. "This issue of anti-estrogenicity is a real one." Researchers need to look more closely at the constituents of cigarette smoke to determine how they affect estrogen and its metabolites, she says.

"We need to understand the [molecular] pathways involved in the associations we've identified," Rebbeck says. If a compound in smoke does act as an anticancer agent in some women, then synthesizing it or finding another agent that mimics it could help women with one of the mutations, he says.

The new study is potentially flawed, however. It's not a random sample of women with a *BRCA* mutation, says John A. Baron, a physician and epidemiologist at Dartmouth Medical School in Hanover, N.H. The healthy women were selected from people who attended a genetic counseling center that was offering tests for the mutations. Smokers may have been particularly motivated to get the test, thus increasing the prevalence of smokers among the participants without cancer. Such factors could have biased the sample and skewed the results, he says.

Rebbeck also treats the findings with caution. "Smoking is not something we would ever recommend to anybody," he stresses.

Women with a mutated *BRCA* gene face an 8 in 10 risk of getting breast cancer by the age of 80, with more than half of the cases appearing before age 50. *—N. Seppa*

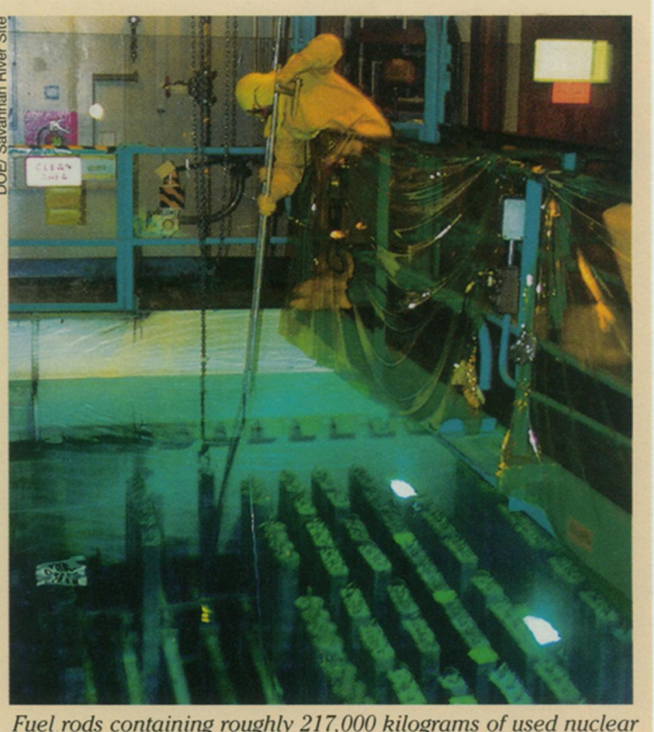
Something's bugging nuclear fuel

Bacteria can thrive in extreme environments, including the highly irradiated pools of water holding used nuclear fuel rods at the Energy Department's Savannah River Site in Aiken, S.C. Microbes inhabiting this storage depot for test reactor fuel may prove a headache for nuclear waste managers, a new study finds, because the bacteria can corrode and crack the fuel's metal housings.

Though microbiologists have indicted acid-producing biofilms—goo-covered communities of bacteria—in the pitting and perforation of surfaces ranging from water mains to offshore oil platforms (SN: 7/20/85, p. 42), Savannah River's waste managers had expected their system to be immune. Not only do they keep the pools virtually free of nutrients, but the fuel rods in them were supposed to be removed in just a few months.

However, with no program in place for disposing of high-level waste and the site's fuel-recycling program on hold, some fuel rods have remained in storage at Savannah River for 30 years. So Carl B. Fliermans' team at Westinghouse Savannah River Co., which manages the site, decided to probe the pools for bacteria. At the American Society for Microbiology meeting in Atlanta this week, the group reported finding up to 10 million bacteria per milliliter of water.

The team also took clean samples of the fuel rods' metal alloys and submerged them in the pools. Colonies of biofilm-producing microbes formed on the pieces within 3 weeks; after a year, they had induced microscopic pits and fissures. Though even the oldest fuel rods show no overt corrosion, all will be closely monitored. The intent, Fliermans told SCIENCE NEWS, "is to nip this thing in the bud"—perhaps using ultraviolet treatments or water filtering. *—J. Raloff*



DOE/ Savannah River Site

Fuel rods containing roughly 217,000 kilograms of used nuclear fuel—including some from U.S. universities and foreign research programs—reside in Savannah River storage basins like this one. No one knows when corrosion-inducing bacteria first seeded these pools. If they piggybacked on incoming fuel, some might have come from overseas.