

Social isolation: Female cancer risk?

Two types of social isolation — having few close friends and relatives, and feeling alone even when friends are present — appear to play an important role in elevating the risk of dying from cancer, at least among women, according to a 17-year prospective study of nearly 7,000 people. The report was presented last week in San Francisco at the annual meeting of the Society of Behavioral Medicine. A strong link between social isolation and subsequent death from cancer did *not* turn up among men in the study, say epidemiologists Peggy Reynolds and George A. Kaplan of the California Department of Health Services in Berkeley, although male cancer cases who were socially isolated tended to have poorer survival rates.

"It appears," says Reynolds, "that social connections have a significant effect on cancer mortality for women."

Long-term studies of people who later develop cancer are rare. Reynolds and Kaplan administered a wide-ranging questionnaire to a representative sample of 6,928 adults living in Alameda County, Calif., in 1965. None of the subjects had a previous diagnosis of cancer. By 1982, computerized records revealed a total of 476 newly diagnosed cancers in the sample and 257 deaths from cancer. Just over half of the cancer diagnoses and deaths occurred among women. The researchers calculated cancer risks after statistically controlling for age, smoking, physical health at the start of the study, alcohol consumption and household income. Cancers were grouped into two types: smoking-related (predominantly lung, throat and mouth cancer) and hormone-related (mainly breast and lymph cancer).

When compared with women who originally reported many social contacts, women who had no or few social contacts were twice as likely to die of all cancers and more than five times as likely to die of smoking-related cancers. In addition, women who both *were* socially isolated and *felt* isolated were nearly twice as likely to contract, and almost three times as likely to die from, all cancers when compared with women with many contacts and no feelings of isolation. Those in this "isolated" group also had five times the risk of dying from hormone-related cancers.

Women reporting many social contacts but who still felt socially isolated were more than twice as likely to die from hormone-related cancers as high-contact, low-isolation counterparts.

"It was a surprise to us that feelings of isolation by themselves could predict deaths from hormone-related cancers among women," says Reynolds. These

cancers rarely occur among men, she notes; for women, the observed association "may have something to do with the effects of emotions on hormone regulation." But the reasons for the strong associations between social isolation and deaths from cancers of all types among women are unclear, adds Reynolds.

Smoking-related cancer mortality is also connected to large increases over the past decade in the number of women who smoke.

Being depressed at the start of the study, she says, bore no relationship to cancer incidence or mortality among all subjects.

— B. Bower

Custom design for DNA snippers

The powerful gene manipulations that underlie modern biotechnology rely on a set of chemical scissors called restriction enzymes. Normally produced by microorganisms, each of these enzymes snips DNA wherever it encounters a specific string of nucleotides, the DNA subunits. A scientist can choose a restriction enzyme that cuts at one of about 100 different four- to six-nucleotide sequences. But there are many other segments where cuts might be desired.

Waclaw Szybalski of the University of Wisconsin at Madison now reports a method to customize a restriction enzyme to snip at any six- to 16-nucleotide sequence desired. It is as if a single adjustable wrench could replace, and provide more applications than, a toolbox full of fixed-size socket wrenches.

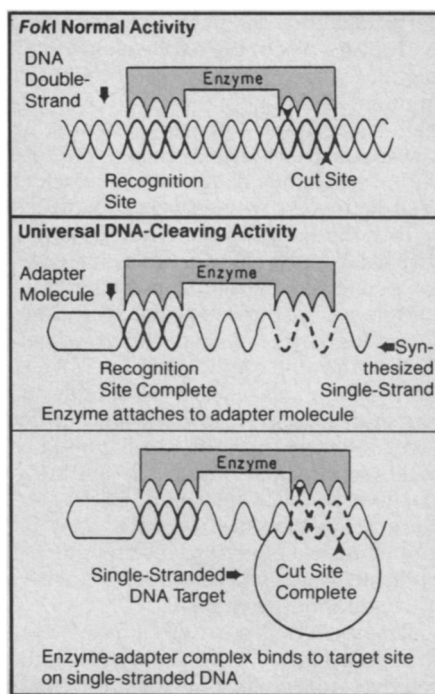
"It's a dream-come-true for enzymologists and molecular biologists who have always wanted a way to tailor their tools to particular tasks," says Szybalski. "Now we have a single, universal tool that can be easily adapted."

Whereas most restriction enzymes make their cuts at a site within the sequence of nucleotides that the enzyme recognizes, members of one small group of natural restriction enzymes have separate "recognition" and "cut" sites. For example, the enzyme *FokI* recognizes a stretch of five nucleotides, then cuts the DNA at a site a fixed distance away.

A hairpin-shaped piece of DNA, synthesized in the laboratory, serves as an adapter, allowing the scientists to snip a target piece of DNA at any specified site. One portion of the adapter contains the recognition site for *FokI*. The enzyme binds to this "portable" recognition site instead of requiring a site on the target.

The method takes advantage of the enzyme's requirement for double-stranded DNA at the cut site. Szybalski and his colleague Anna J. Podhajaska include in the adapter a tail of single-stranded DNA, whose sequence specifies where the enzyme will cut. The enzyme *FokI* will make a cut only after the adapter tail forms links to a complementary sequence of nucleotides, found within the target DNA (provided in single-stranded form). Once snipped, the DNA is released and reconverted to a double strand.

Some caution is expressed by Ira Schildkraut of New England Biolabs, the Beverly, Mass., company that sells *FokI* and that funded Szybalski's research. "As



it stands, it's a clever thing to do, but it's not easy and it's relatively expensive," Schildkraut says. He sees its immediate value in special applications; for example, for cutting at sites with a relatively long specified sequence or for snipping DNA of large chromosomes into long pieces.

— J. A. Miller

Mystery disease stalks older cats

Around 1980, veterinarians began noticing that some cats were displaying symptoms similar to those of humans with a hyperactive thyroid gland: weight loss despite a healthy appetite; high-strung activity; rapid heart rate; overactive gut; high-volume stools. Initially a rare disease, feline hyperthyroidism has mushroomed to epidemic proportions in some regions of the United States, according to Leslie Bullock, a veterinarian studying the disease at Tufts University in Boston. Baffled vets are trying to determine what's causing this disease and why it strikes only older cats.

Bullock says the disease may affect one in 100 cats 8 years old and older in the most highly affected regions, like Boston and New York. Veterinarian Mark Peterson, a feline hyperthyroidism expert at