

Cancer gene screening possible for Jews

Descending from a line of Eastern European Jews, the Ashkenazim now account for around 80 percent of all Jews worldwide, including more than 6 million in the United States. In a new study, investigators from the United States and Israel have reached the startling conclusion that about 1 in 100 Ashkenazi Jews may carry a specific mutation in a gene linked to breast and ovarian cancer.

That finding raises the possibility of one day screening Jewish women for the mutation. "The implications are enormous," says Lawrence C. Brody of the National Institutes of Health's National Center for Human Genome Research in Bethesda, Md., an author of the new study.

"In principle, you could alert the women at risk and recommend they take preventive measures," comments Thomas H. Murray of the Center for Biomedical Ethics at Case Western Reserve University in Cleveland. Women with the mutation might have more frequent mammograms, for example.

The link between the Ashkenazim and a single cancer mutation emerged recently, after researchers discovered *BRCA1*, a long-sought breast and ovarian cancer susceptibility gene on chromosome 17. Though the gene is rarely mutated in random cancer cases, investigators have found that most families plagued by breast and ovarian cancer carry mutations in *BRCA1*.

Some of the families examined were Ashkenazim, and researchers noticed that all of them had exactly the same *BRCA1* mutation, a small deletion in the gene's DNA sequence. "We think the mutation originated only one time in history, passed from generation to generation, and established itself in the Jewish population," says Steven Narod of McGill University in Montreal.

To determine the prevalence of the mutation among the Ashkenazim, Brody and his coworkers collected stored DNA samples from 858 unrelated Israeli and U.S. Ashkenazi Jews. The samples were left over from previous screenings for cystic fibrosis and Tay-Sachs disease. The researchers found the previously identified *BRCA1* mutation in eight samples, or about 0.9 percent of the total. None of the DNA samples from a control group of 815 people representing the general U.S. population had the *BRCA1* deletion.

Other studies indicate that only 1 person in 800 carries any *BRCA1* mutation, says Brody, and that no one mutation occurs with high frequency. This has precluded serious consideration of routine *BRCA1* screens for all women because researchers would have to scan the full gene, an effort that could cost thousands of dollars per individual. In con-

trast, investigators estimate that a test for the suspected deletion might cost less than \$50 a person.

Researchers, including Brody, caution that the new study does not yet provide enough information to warrant screening of all Ashkenazi women. They recommend pilot studies that would examine a few thousand Ashkenazim in order to confirm the mutation's prevalence in the population. Brody expects that the studies could be completed in a year or two.

"We can start thinking about a policy, but it's too early to put a policy in place. We shouldn't yet start placing screening centers at the doors of synagogues," says David E. Goldgar, a geneticist at the University of Utah School of Medicine in Salt Lake City.

Yet Goldgar admits it may be difficult to stem the demands of adult Jewish women, even those with no family history of breast or ovarian cancer, for the test. "It will be difficult for clinicians to say no. The line between targeted testing based on family history and general population screening is likely to blur," Goldgar and Philip R. Reilly of the Shriver Center for Mental Retardation in Waltham, Mass., write in a commentary that accompanies Brody and his coworkers' report in the October

NATURE GENETICS.

Researchers are concerned because they don't know how often this particular mutation actually leads to cancer. They also stress that testing negative for this particular mutation doesn't guarantee a cancerfree life.

"The counseling would have to be very extensive so people know what they're getting into. Many people who have this mutation may not get cancer, [while] others who don't still will," says Arno G. Motulsky of the University of Washington in Seattle.

This new *BRCA1* study may reopen the debate over possible abuse of genetic testing information, such as denial of health insurance. "That's a substantial disincentive to learn one's genetic risks," Murray says.

Finally, the *BRCA1* research has added an unusual twist to the explosive debate about the unusually high incidence of breast cancer on Long Island, New York. That peculiarity has often been attributed by patient groups to the use of pesticides in the region, but an editorial in the same issue of *NATURE GENETICS* notes that Long Island is home to one of the largest populations of Ashkenazi Jews in the United States.

Calling the editorial "unfortunate," Brody says his group's results are "probably not going to account for the Long Island data."
— J. Travis

Device measures speed with white light

As a train comes into the station, the pitch of its whistle rises. As it leaves, the pitch falls.

That classic change of pitch demonstrates the Doppler effect, in which sound waves from a moving object are squeezed as the target approaches and stretched as it departs. Scientists can use this principle to measure an object's speed.

The same process works with light. Using reflected laser light, researchers can measure the velocities of cars, tornadoes, and even falling rain. Or using ultrasound, physicians have clocked the speed of blood coursing through a person's veins. But because these techniques demand expensive equipment and delicate measurements, they have found mainly specialized applications.

Now, scientists report they can measure velocity with old-fashioned white light. David J. Erskine and Neil C. Holmes, physicists at the Lawrence Livermore (Calif.) National Laboratory, explain in the Sept. 28 *NATURE* how to determine the speed of moving objects using broadband, incoherent illumination—like that from a flashbulb or a strobe light.

"This approach represents the next logical step in velocity interferometry," says William M. Isbell, a physicist at ATA Associates in Santa Barbara, Calif. "It should enable us to do things we couldn't

do before."

In the conventional Doppler technique, a laser illuminates a moving object while an interferometer measures the shift in phase of the reflected light—a shift caused by bouncing the light off a moving target.

In the new method, white light passes through an interferometer, bounces off a moving target, and ends up at a second interferometer. The second interferometer measures the shift in wavelength caused by the target's motion, then compares those data to the measurements of the first interferometer.

In this process, the observer sees a rainbow pattern of colorful fringes coming off the moving object. Decoding the information from those fringes, says Erskine, "you get the same result that you would get with a laser, except that you don't have to spend \$50,000."

Wind tunnels provide a good way to put this new technique to use, says Erskine. At the moment, he says, "you're limited to the measurements of a few small spots on, say, a car body or an airplane wing. But you can't measure the wind more than a few inches from the sensor."

The technique can yield an entire air-flow profile, he says. "You can get a contour map of the wind coming off of a car or wing."
— R. Lipkin