

Virus type predicts risky cancer return

Women whose cervical cancer tumors contain a certain strain of human papillomavirus (HPV) will more likely suffer cancer recurrence after surgery than women showing no hint of this HPV in their tumors. That preliminary finding adds credence to the notion that one type of HPV leads to a more aggressive cervical cancer. If confirmed, the research may help doctors identify cervical cancer patients who need further therapy.

Human papillomaviruses are DNA-containing viruses that commonly cause warts. While scientists have identified nearly 60 HPV types, they have implicated just a few in cervical cancer.

Joan Walker, Sharon P. Wilczynski, Jeffrey D. Bloss and colleagues at the University of California Irvine Medical Center in Orange studied 100 women treated for cervical cancer. The researchers extracted DNA from tumors removed during surgery and used DNA probes to distinguish between three HPV types that commonly infect cervical cancer cells. The team found 46 women had tumors containing a kind of HPV known as HPV-16, 16 women had tumors with HPV-18 and two women had tumors with HPV-31. The remaining 36 women had no discernible HPV in their tumors.

Of the 100 women, the researchers focused on 69 who had a less severe form of cancer that appears confined to the cervix. Typically doctors can get about an 85 percent cure rate by treating such women with primary therapy such as a

radical hysterectomy — removal of the uterus, cervix and nearby tissues. The California team's report in the November *OBSTETRICS & GYNECOLOGY* suggests HPV typing may pinpoint the 15 percent of women who might benefit from additional treatment, such as chemotherapy or radiation, to kill cancer cells that remain after surgery.

The research team found 45 percent of women with tumors containing HPV-18 had cancer recurrence during the 20-month post-surgery observation period as compared to just 16 percent of women with HPV-16 tumors and 15 percent of women with no detectable HPV in their tumors. The scientists did not find a statistically significant higher death rate among women with HPV-18 tumors, although they suggest longer studies may show these women have a greater risk of dying early compared with women whose tumors contain no HPV-18. The study results must be confirmed before doctors can use HPV typing to recommend additional cervical cancer therapy, which can cause serious side effects, says Wilczynski, now at the City of Hope National Medical Center in Duarte, Calif.

The study suggests HPV-18 causes a rapidly progressing type of cervical cancer — one that may go undetected by the Pap test used to detect precancerous cervical cells. The researchers found 45 percent of women with HPV-18 tumors had three normal Pap tests in the three years preceding their cervical cancer diagnoses. Only 16 percent of women with HPV-16 tumors had similar histories. The scientists now are studying healthy women with HPV-18 infection to see if they will get cancer. — *K.A. Fackelmann*

Supernova burps rid galaxies of hot gas

The concerted action of thousands of exploding supernovas concentrated in small regions of a young, gas-rich galaxy could provide the power necessary for the ejection of gigantic blobs of matter. Shot out at high speeds, these expanding clumps would carry metal-laden gas to a galaxy's fringes and beyond. Such a scenario may help explain how evolving spiral galaxies redistribute chemical elements and how young spiral galaxies, which seem to have larger disks than their older counterparts, can shrink while maintaining a certain density.

This picture of galactic evolution comes out of a simple computer model developed by Jane C. Charlton, now at the University of Arizona in Tucson, and Edwin E. Salpeter of Cornell University in Ithaca, N.Y., who describe their findings in the Nov. 1 *ASTROPHYSICAL JOURNAL*.

"It's certainly a highly speculative model," Charlton says. "Whether these things happen at all isn't clear." Nonetheless, the model makes several interesting predictions that may enable observers to check it.

In their model, Charlton and Salpeter assume that young galaxies tend to form massive stars that last only a few million years before exploding. Much of the released energy goes into heating up interstellar gas, creating large, hot blobs with individual masses about 10 million times that of the sun.

Although these blobs spread out laterally nearly as much as they travel outward, they can be treated mathematically in the same way as cannonballs fired from the Earth's surface. Some of these galactic cannonballs would move fast enough to escape the galaxy's gravitational field, while slower ones would eventually fall back into the galactic disk.

The escaping blobs would carry away angular momentum, meaning the galaxy would spin down while shrinking its extended disk. Computer simulations show that ejecting 10 to 20 percent of a disk's mass in the form of blobs over 10 billion years would be sufficient to cut the galaxy's disk to half of its initial size.

Blobs with insufficient velocity to escape the galaxy would eventually reenter the disk, enriching it with metallic elements created in the supernova explosions. Computer simulation results predict that such a galaxy's outskirts would have an unexpectedly high concentration of metallic elements.

"As you go out, the metal abundance first goes down and then goes up," Salpeter says. "That's certainly opposite to what most people would guess." Astronomers now have an incentive to look for this type of variation in metal abundance.

— *I. Peterson*

Federal fetal transplant ban continues

Last week the Bush Administration extended a 20-month ban on federal funding for research involving fetal tissue transplantation. Anti-abortionists hail that decision, but many biomedical scientists criticize the ban. They say the moratorium puts on hold promising research that may offer hope to victims of diabetes, Parkinson's and other debilitating disorders.

Department of Health and Human Services (HHS) Secretary Louis W. Sullivan sent a letter announcing the HHS decision to the National Institutes of Health (NIH), which funds much of the nation's biomedical research. "After carefully reviewing all of the materials, I am persuaded that one must accept the likelihood that permitting the human fetal research at issue will increase the incidence of abortion across the country," Sullivan wrote.

The ban does not apply to other research using fetal tissue, but only to the transplantation of human fetal

tissue from induced abortions. Scientists claim it is almost impossible to get usable tissue for research purposes after a spontaneous abortion. Fetal tissue transplantation research continues in several countries, including Sweden and Mexico.

The HHS decision runs counter to the recommendation of an NIH advisory panel, which last year called the use of aborted human fetal tissue "morally acceptable." That 21-member panel said that fetal cell transplantation research in the United States should continue (SN: 9/24/88, p.197).

Many scientists urge President Bush to follow the advice of that panel and lift the U.S. ban. "We fully respect the views of those opposed to [abortion]," says Pamela B. Davis, the president of the American Federation for Clinical Research (AFCR). "However, the use of tissue and organs obtained from deceased fetuses should not be considered in the context of abortion." □