Warts or cancer? Tissue type may tell

A woman's tissue type may determine whether she develops cervical cancer after infection with a virus that otherwise may cause only genital warts, according to three new studies. But the results of these studies are controversial, and researchers say they are still years away from using tissue type to help predict a woman's chances of progressing from genital warts to cervical cancer.

In previous studies, epidemiologists linked cervical cancer to infection with three particular strains of human papillomavirus (HPV), the virus family responsible for genital and skin warts. In those studies, women who developed cervical cancer were more likely to have HPV-16, HPV-18 or HPV-33 infections than were healthy women.

But HPV infection alone cannot account for the 13,500 new cases of cervical cancer diagnosed annually in the United States. Many women with genital warts never advance to cervical cancer, and some HPV-infected women develop neither warts nor cancer.

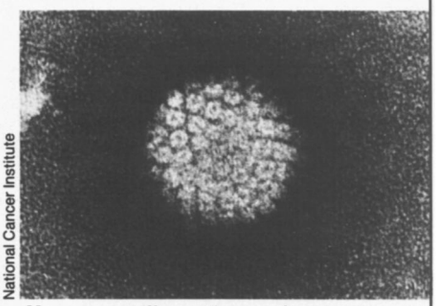
Accordingly, researchers began looking for other factors that might contribute to HPV's suspected ability to cause cancer. One study showed that a chemical present in cigarette smoke can help HPV turn skin cells similar to cervical cells malignant (SN: 4/6/91, p.215); another found that a cancer-causing gene, or oncogene, underlies some cases of aggressive cervical cancer (SN: 6/1/91, p.347). And last summer, a German team linked one of the most common tissue types among Caucasians to a high risk of cervical cancer.

Now, a group of researchers in France has shown that rabbits with a particular tissue type are more resistant than other rabbits to skin cancers caused by a papillomavirus. These researchers, led by Gerard Orth of the Pasteur Institute in Paris, report in the March 5 NATURE that rabbits whose cells bear a specific type of protein receptor are more likely to prevent virally caused precancerous warts from progressing to cancer.

Orth's team infected 77 rabbits with cottontail rabbit papillomavirus, a relative of HPV. All of the rabbits developed skin warts, which went away after a few weeks in most cases. However, warts persisted in 23 of the rabbits, and researchers discovered that 11 of those 23 animals developed skin cancer within one year. Moreover, when Orth and his colleagues analyzed the tissue types of the rabbits, they found that most of those whose warts turned malignant had a particular type of major histocompatibility complex (MHC) protein on their cells.

Orth's team concludes that some types of MHC – an immune system protein that helps the body distinguish self from nonself – are better than others at discerning and attacking cancerous cells. Their conclusion is supported by two reports in the same issue of NATURE involving women with cervical cancer.

Anne-Lise Borresen and her colleagues at the Norwegian Radium Hospital in Oslo performed genetic testing on 213 cervical cancer patients. They found that two-thirds of the women carried the gene for tissue type DQW3, although that tissue type was present in only half of a group of 181 healthy women.



National Cancer Institute

Human papillomavirus as it appears under an electron microscope.

In addition, the two German researchers who first reported the HPV-tissue type link in cervical cancer report that they confirmed their initial blood-test results using genetic testing. "[This] suggests that . . . MHC may influence the effectiveness of an immune response against [cervical cancer], which is thought to be virally induced," write Rudolf Wank of the Ludwig Maximilians University in Munich and Christoph Thomssen of the Technical University of Munich.

But in the same issue of NATURE, a group of British researchers cautions against drawing hasty conclusions. When these researchers, led by Peter L. Stern of the Paterson Institute for Cancer Research in Manchester, compared 65 cervical cancer patients with 857 healthy controls, they found no statistically significant differences in tissue type between the two groups. Stern and his colleagues warn that "it may be premature" to conclude that women with certain tissue types have a higher risk of developing the disease.

Population geneticist William Klitz of the University of California, Berkeley, comments that "it's going to take some time" to reconcile these results. As a first step, he recommends testing a group of cervical cancer patients for HPV and tissue type to verify the connection. – *C. Ezzell*

Monkeys may provide AIDS dementia model

Physiologist Elisabeth Murray remembers hearing tales circulated within research circles that some monkeys turned clumsy after becoming infected with simian immunodeficiency virus (SIV). At the time, she didn't know whether the stories were true, let alone whether they might have implications for humans. Now she does.

In a year-long study conducted at the National Institute of Mental Health in Bethesda, Md., Murray and four colleagues have established for the first time that rhesus monkeys infected with SIV develop cognitive and motor-skill problems resembling those seen in many people infected with human immunodeficiency virus (HIV), which causes AIDS. Because of the similarity, the researchers think SIV-infected monkeys may provide a useful model for studying this impairment – sometimes called AIDS dementia – in humans. They present their findings in the March 6 SCIENCE.

Distinguished by loss of memory and muscle coordination, AIDS dementia affects both children and adults infected with HIV, although it occurs far more often in children, says Philip A. Pizzo, head of pediatrics at the National Cancer Institute in Bethesda, Md. "In children [with AIDS], the figures go anywhere from about 50 to 90 percent," he says.

A simian model for AIDS dementia would allow researchers to test not only new drug therapies but also new hypotheses about what actually causes these neurological symptoms. For example, one theory implicates quinolinic acid, a substance produced in the brain. HIV infection may lead to overproduction of this substance, which acts as a neurotoxin at high levels.

Right now, the researchers don't know what triggered the dementia-like symptoms in the monkeys. "We're really in the dark here," Murray told SCIENCE NEWS. "We don't understand what's happening between SIV infection and this behavioral impairment."

For the study, Murray and her colleagues trained a group of rhesus monkeys to perform a series of tasks designed to test their memory, reasoning ability and motor skills. The researchers then infected eight of the monkeys with SIV; five uninfected monkeys served as controls. Within six months, four of the infected monkeys showed impaired reactions in one or more behavioral tasks. By 10 months, all but one of the infected animals showed signs of neurological impairment, while all of the control monkeys continued to perform normally.

"It's another piece of the puzzle for understanding HIV and SIV," Murray says. – *M. Stroh*