Virus, cervical cancer link clarified

The human papillomavirus (HPV) appears to exploit a weakness in one of the body's star cancer fighters—the p53 protein. The less effective defense that results allows the virus to disrupt cell growth—and that change sometimes develops into cervical cancer, British and Canadian researchers report.

The composition of the p53 protein can vary, depending on the *p53* gene that encodes it. In some people, the gene encodes a protein with an amino acid called arginine in a certain location. In others, the protein has proline in that spot. Some people have one copy of each of these variants of the *p53* gene.

The researchers began by assessing the genetic makeup of cervical tissue. In samples taken from 41 healthy women, 15 had only the protein containing arginine at this location. In contrast, 23 of 30 samples from women with cervical cancer had only that version of the p53 protein, the researchers report in the May 21 NATURE.

"It can be argued that HPVs . . . have found a weak link in the p53-arginine variant," says study coauthor Greg Matlashewski, a geneticist at the McGill University Cancer Centre in Quebec.

What difference might the variant make? According to study coauthor Alan Storey, a molecular biologist at the Imperial Cancer Research Fund in London, an HPV protein called E6 attacks the p53-arginine protein more effectively than the p53-proline protein. The viral protein binds p53, degrades it, and thus hampers its ability to prevent other cells from dividing out of control. The findings bolster the theory that specific viral proteins are somehow responsible "for turning normal cells into cancer cells," Storey says.

Evidence of the virus can be found in nearly every case of cervical cancer, says Matlashewski. The sexually transmitted HPV comes in more than 100 varieties. At least one of two HPV strains—numbers 16 and 18—were detected in 90 percent of tumors examined in this study. The Achilles heel provided by p53-arginine may come into play only when the p53 protein is confronted with these strains of HPV, Storey says.

At any given time, about 8 percent of the women in Northern Europe are infected with HPV 16 or 18, but many fewer develop cervical cancer. The reason may stem in part from the distribution of the different forms of p53 proteins, Storey says. —*N.S.*

Do high heels boost arthritis risk?

High-heeled shoes have long been known to cause hammertoes, bunions, and other deformities of the foot. New research suggests that these fashionable shoes may contribute to a potentially disabling arthritis of the knee.

D. Casey Kerrigan of the Spaulding Rehabilitation Hospital in Boston and her colleagues studied 20 women accustomed to wearing high-heeled shoes. The women walked in their own shoes and then barefoot across a walkway in the laboratory. A specialized video camera recorded each woman's walk and allowed the team to calculate the strain put on her knee joints.

The researchers discovered that high heels increased the strain on the inner side of the knee by 23 percent. That extra stress may cause degenerative changes in the joint, Kerrigan says, leading to osteoarthritis. This condition differs from the autoimmune disorder known as rheumatoid arthritis.

Osteoarthritis of the knee is twice as common in women as in men—perhaps due to the largely female habit of wearing high-heeled shoes, Kerrigan speculates.

Nobody really knows how flat a heel needs to be in order to avoid the risk of osteoarthritis. "To be on the safe side," Kerrigan counsels women to wear flats, not heels. The study appears in the May 9 LANCET. —*K.F.*