Biomedicine

Wild rats have hepatitis E history

In research that could help scientists ascertain how people contract hepatitis E, a new study indicates that more than 80 percent of U.S. wild rats might carry antibodies to the virus.

Hepatitis E infection is widespread in many developing countries, and up to 5 percent of people in the United States carry antibodies to the virus, indicating that they have been infected in the past. Infection can cause flulike symptoms or can be more severe, especially in pregnant women.

Earlier research suggested that pigs carry a strain of hepatitis E virus that they may transmit to humans. However, infection rates in the United States are highest in urban centers, where people are unlikely to encounter farm animals. Some researchers, therefore, suspected that other animals, such as city-dwelling rats, might carry the virus, as well.

In the new study, Yamina Kabrane-Lazizi of the National Institute of Allergy and Infectious Diseases (NIAID) in Bethesda, Md., and her colleagues captured 239 rats in alleyways, along rivers, and at other spots. In the August American Journal of Tropical Medicine and Hygiene, the team reports that 77 percent of captured rats from Maryland, 90 percent from Hawaii, and 44 percent from Louisiana carried antibodies to the virus in their blood.

Because hepatitis E infection often doesn't last long, the researchers were not able to isolate the virus from the captured rats and determine whether the strain that had infected them is one that also infects swine and people.

"There's no direct evidence for transmission from rats to people," says study coauthor Robert H. Purcell, also of NIAID. "We'd like very much to recover the virus [from rats] and compare it with human and swine strains to see where it fits into the ecology." —*S.C.*

Tissue recipients are free of pig virus

A new study bodes well for organ transplants and other medical treatments that mix human and pig cells. Researchers examined 160 patients who had undergone, during the past 12 years, a variety of experimental procedures that use pig tissue. In some cases, physicians had run patients' blood through external pig spleens, livers, and kidneys. Other treatments included grafts of pig skin and transplants of porcine pancreatic endocrine cells.

Although potential benefits of transplanting a pig's heart, kidney, or other tissue to humans are great, such experimental procedures may also be dangerous. The patient's immune system may reject the porcine tissue, or the pig's organ may not function smoothly in its new host. Physicians have also recognized a third obstacle. Pig tissue might infect patients with viruses that don't otherwise infect humans.

One such microbe is porcine endogenous retrovirus, or PERV, which all pigs carry without showing any symptoms (SN: 4/19/97, p. 245).

A report in the Aug. 20 Science, however, indicates that pig-tissue treatments don't infect humans with PERV. Using a technique known as polymerase chain reaction to search for the retroviral DNA in patients' blood, researchers led by Khazal Paradis of Imutran, a biotechnology company in Cambridge, England, found that none of the patients treated with pig tissue was infected with PERV. Although 23 patients retained some pig cells for up to 8 1/2 years after treatment, they showed no sign of the virus.

In an editorial accompanying the report, Robin A. Weiss of University College London remarks, "For the individual transplant recipient, the real promise seems to be greater than uncertain peril." Indeed, pig-to-person transplantation might pose a lesser threat of infection than a graft from an unknown human donor does, he says. —*S.C.*

Aspirin limits drug-caused deafness

If a finding in guinea pigs holds true in people, regular aspirin may prevent the hearing loss sometimes caused by certain antibiotics. Aminoglycosides such as streptomycin, gentamicin, and neomycin are widely used against infections in developing countries because of their low cost. In developed countries, physicians use these drugs to treat tuberculosis and infections resistant to other antibiotics.

When aminoglycosides bind iron, they produce free radicals, unstable molecules that can damage or kill cells. Hair cells in the inner ear—which don't regenerate and are crucial for hearing—are especially sensitive. Even in countries where physicians carefully monitor the drug's side effects, one in five people given aminoglycosides loses some hearing.

Aspirin's benefit stems from the fact that it quickly breaks down into salicylate, a compound that soaks up extra iron and thereby prevents aminoglycosides from forming free radicals, says Jochen Schacht of the University of Michigan in Ann Arbor.

Six animals given both gentamicin and aspirin had less hair-cell damage and hearing loss of less than 20 decibels, he reports in the July Laboratory Investigation. Another six guinea pigs given gentamicin injections alone lost many hair cells and experienced as much as 70 decibels of hearing loss.

"Salicylate levels providing protection in guinea pigs fall into the lower range recommended for anti-inflammatory therapy in humans," he says. He's currently testing the effects of aspirin therapy among people taking aminoglycosides in China. —*D.C.*

Thick blood may signal stroke risk

People with blood that clots readily are slightly more likely to have strokes than people with blood that clots less easily, according to a report in the Aug. 17 Circulation. Most strokes are triggered by blood clots that block oxygen from reaching the brain. Previous research has shown that heart attacks, often caused by blood clots in arteries of the heart, are more common in people with blood prone to clotting.

Researchers took blood samples from 14,700 middle-age people and measured concentrations of two compounds, called factors, that cause platelets to stick together and form clots. Over the next 9 years, people with the highest concentrations of von Willebrand factor were 1.7 times as likely to have a stroke as those with the lowest concentration. People with high factor VIIIc concentrations were 1.9 times as likely to develop strokes as those with lower amounts.

These factors may increase stroke risk by promoting blood clots in the brain, says author Aaron R. Folsom of the University of Minnesota in Minneapolis. However, high blood pressure and smoking are more strongly linked to stroke, so doctors should focus on preventing these risk factors, he says. —*D.C.*

Hold your breath: Lung cancer screens?

Lung cancer is one of the most common and most deadly cancers. Only about 12 percent of lung cancers are cured, primarily because few lung cancers are caught before they spread.

Studies have suggested that X-ray screening for lung cancer is ineffective. According to the July 10 Lancet, low-dose computed tomography (CT) that allows doctors to completely scan the lung during a single breath may change that picture.

Among 1,000 men and women who had smoked at least a pack of cigarettes a day for 10 years, CT scans detected cancer in 27 patients; X rays found cancer in just 7 of these people. CT also detected substantially smaller malignant tumors than those found by chest X rays.

"Detecting more cancers in earlier stages changes survival prospects from dismal to very positive," says Claudia I. Henschke of New York Presbyterian Hospital. Thus, CT screening may prove more effective than mammograms at saving lives, she says. —*D.C.*