Another test found that 15 of 50 multiple sclerosis patients harbored DNA from the replicating virus itself, says Steven Jacobson, a viral immunologist at the institute and a coauthor of the report, which appears in the December NATURE MEDICINE.

Both findings were curious. First, the antibodies were the sort that a body produces in the throes of a battle against the virus, not "memory" antibodies that circulate routinely in the body, awaiting a call to action, Jacobson says. The only other study participants to show high concentrations of these antibodies were two of the patients with lupus and a patient with another inflammatory disease.

In the second part of the study, the researchers detected no active DNA from HHV-6 in anyone other than multiple sclerosis patients.

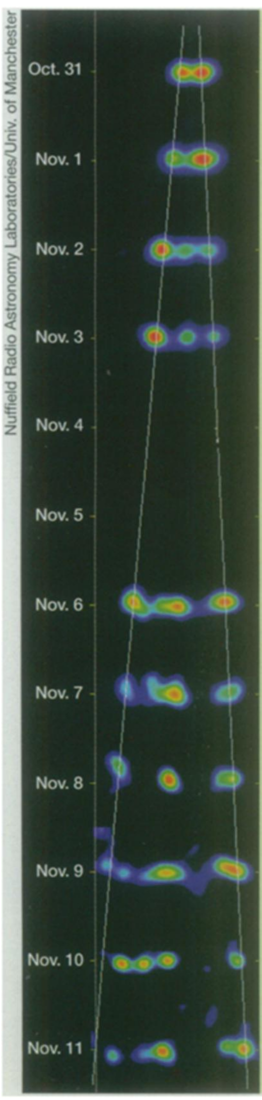
Preliminary evidence from an ongoing study shows that HHV-6 protein is present in areas of the brain where myelin is being destroyed—but not in healthy areas of the same patient's brain, Jacobson says.

"This is very interesting and potentially important work, but it leaves a conundrum," says David A. Hafler, an immunologist and neurologist at Harvard Medical School in Boston. "Is HHV-6 really involved [in the cause of multiple sclerosis], or is it just a consequence of the disease?" The evidence doesn't resolve this question, but the study adds to the growing school of thought among scientists that viruses are somehow involved with multiple sclerosis, Hafler says.

Jacobson agrees that no one knows what causes the debilitating disease, but he says that herpesviruses make fitting suspects. These viruses attack the nervous system and typically lie dormant for long stretches—just as multiple sclerosis does. "We know this is a latent and persistent virus," Jacobson says.

In any case, the findings convincingly show that many multiple sclerosis patients have an HHV-6 infection, says Byron H. Waksman, an immunologist at New York University.

The new study may provide evidence that HHV-6 acts to maintain, rather than cause, multiple sclerosis lesions, Waksman says. Either way, the long progression of multiple sclerosis may remain a puzzle even after the role of the virus is understood, he says. *—N. Seppa*



Tracking a black hole eruption

On Oct. 29, astronomers around the world were alerted that a massive, compact body 40,000 light-years from Earth was once again shooting off fireworks. Within 2 days, scientists had trained an array of radio telescopes on the object, a suspected black hole partnered by an ordinary star.

For 2 weeks, the telescopes tracked the evolution of two oppositely directed jets of radio-emitting gas spewed by the black hole system, known as GRS 1915+105. Each jet races at 90 percent of the speed of light. Because one of the jets points toward Earth, it appears to move twice as fast as this cosmic speed limit.

Astronomers had previously observed superluminal motion of material expelled by GRS 1915+105, notably during a giant outburst 3 years ago (SN: 9/3/94, p. 150). The network of telescopes employed during the most recent event, however, tracked the activity closer to the black hole than ever before—within about 400 light-years, says Thomas W.B. Muxlow of the University of Manchester in England. He and his colleagues announced their findings this week.

Known as MERLIN (multi-element radio-linked interferometer network), the telescope array consists of six detectors spread across England, working in concert to create radio images sharper than the Hubble Space Telescope can generate in visible light. Other arrays, even larger than MERLIN, can home in on smaller objects but can't detect such faint emissions, Muxlow notes.

GRS 1915+105 is called a microquasar because its stream of X rays and blasts of radio-emitting gas resemble a scaled-down version of the action of quasars in faraway galaxies. By monitoring this nearby source, "we can apply [what we learn] to much more distant objects in the universe," says Muxlow. *—R. Cowen*

False-color radio images (red denotes the most intense emissions) track gas blobs shot from a suspected black hole. The blobs at left are approaching Earth and seem to move faster than light. Gas in the most recent image has two-hundredths the brightness of that in the earliest.

Corroded planes turn paint pink

Airplanes get rained on, baked in the sun, and attacked by the wind—onslaughts that corrode metal and ultimately compromise safety. Detecting corrosion can be a tedious job for maintenance crews, since many imaging techniques work only on one small area of a large aircraft at a time.

Now, researchers are developing a way for airplanes to signal to their crews when it's time for repairs. At a meeting of the Materials Research Society in Boston this week, Gerald S. Frankel of Ohio State University in Columbus described paints that change color if the underlying metal becomes corroded.

The paints, created by Frankel and his colleague, Jian Zhang, detect changes in acidity and alkalinity, measured as pH. When water and air attack some metals, the resulting electrochemical reaction produces ions that increase pH.

One of the paints consists of a clear acrylic coating mixed with phenolphthalein, a chemical that turns from colorless to red above a given pH. Frankel and Zhang made test samples by covering pieces of an aluminum alloy with the special coating and a top layer of plain acrylic.

Passing a current through the samples stimulated the electrochemical reaction, and visible pink spots popped up. Later, Frankel says, "we will probe with electrochemical and other techniques to prove there is corrosion happening locally." From these measurements, the researchers calculate that the phenolphthalein coating could detect pits less than 15 micrometers deep.

The team has also looked at acrylic mixed with a compound that fluoresces under ultraviolet light when above a particular pH. By measuring the emitted light with a spectrophotometer, Frankel says, the researchers may be able to quantify the color change and thus the extent of corrosion.

The color change method, says William M. Mullins of Technical Management Concepts at Wright-Patterson Air Force Base in Ohio, is a "very clever idea. You could walk down the vehicle and see there's a pink spot. It would be very nice to be able to do that without actively going in with an instrument."

The new method would be especially useful for detecting the most troublesome corrosion, which is concealed around rivets and in the joints where sheets of metal overlap, says Mullins, who uses ultrasound to map out and model corrosion on the surface of materials.

Only clear coatings will work, but that limitation on airplane appearance may not matter if the coatings are used in hidden places, Frankel says. *—C. Wu*