Early liver cancer now detectable

A fast, inexpensive blood test that can detect deadly liver cancer in its early, treatable stages may become generally available within a year, scientists at Massachusetts General Hospital announced last week in Boston.

The tool may prove especially valuable in Africa and Asia, the researchers say, where a high rate of chronic hepatitis B infection seems to foster liver cancer. Chronic viral infection in the United States is much rarer — about 0.1 percent of the population compared to 17 percent in China and 90 percent in some parts of Africa. But certain U.S. subgroups, including homosexual men and Asian immigrants, seem particularly prone to the virus and to developing the cancer, which almost invariably kills patients within three to six months after the first symptoms appear. Finding the tumor early and surgically removing it can increase a patient's chances of surviving beyond five years to 50 percent, says Jack Wands, one of the test's developers. Hepatitis B carriers would be the logical first group to screen for cancer once the assay becomes available, he told SCIENCE NEWS.

Some years ago, scientists recognized that liver cells deranged by cancer and other illnesses produce high levels of alpha fetoprotein, a protein produced normally only by the developing fetus and shut off at birth. Wands and Kurt Isselbacher, also of Massachusetts General, carried that finding a step further, working for eight months with French scientists Dominique H. Bellet and Claude Bohuon of the Institut Gustave Roussy to create an alpha fetoprotein assay that could reliably and specifically identify victims of liver cancer from among sufferers of more benign liver diseases.

The scientists have used a combination of two distinct monoclonal antibodies that bind to different spots on the alpha fetoprotein chain to test more than 1,700 patients to date. The test, they say, has "extraordinary specificity" for the protein — four to ten times the sensitivity of conventional methods. —*D. Franklin*

Viral AIDS suspect stripped of alibi

Hunters of the microbe that causes AIDS threw a net over their prime suspect last spring (SN: 4/28/84, p. 260; 5/5/84, p. 285), and have been scurrying ever since to pinpoint the culprit and determine its *modus operandi*. While the investigators are nearly convinced that HTLV-III and LAV are two aliases for the same virus, and that the single virus is instrumental in triggering acquired immune-deficiency syndrome, they cautiously admit that all the evidence to date has been circumstantial.

To satisfy the rigors of traditional virologic proof, the researchers would like, ideally, to isolate pure virus from one victim, inject it into a healthy animal and produce the disease, then repeat the results in a third animal. But, so far, such efforts have been foiled by the virus's apparently exclusive preference for human victims. Now, an unfortunate accident in southern California, reported in the July 6 SCIENCE, has produced what many researchers believe is about as close to direct evidence as they may find.

A 38-year-old woman received two units of packed red blood cells from two different donors during gynecologic surgery. Two months later, one of the blood donors, a 24-year-old homosexual man, was hospitalized with a type of pneumonia associated almost exclusively with AIDS. The woman was notified immediately and closely followed through blood sampling in the ensuing months for signs of immune-deficiency. Seven months after surgery, her doctors noted the first dip in the number of infection-fighting white blood cells, and five months later, she too developed the telltale lung infection linked to AIDS. Paul M. Feorino and colleagues from the federal Centers for Disease Control (CDC) in Atlanta searched blood samples from the two patients together with scientists at the University of California at Los Angeles and the Institut Pasteur in Paris, for the putative virus the French have named LAV (lymphadenopathy-associated virus). They found it in both patients, and note that LAV is probably the same as HTLV III, an AIDS-associated virus isolated in Robert Gallo's laboratory at the National Cancer Institute.

"It's about the closest thing you're going to get to an animal model for AIDS," Jeffrey Laurence, an AIDS researcher at Rockefeller University who is familiar with the CDC work, told SCIENCE NEWS. "All you really need is one good case, and this is a good case." Further corroborative evidence from the CDC is expected soon.

Meanwhile, work has already begun on a blood screening test based on HTLV-III. The U.S. Public Health Service, which holds a patent on the cell line and methods Gallo used to produce large quantities of the virus, issued non-exclusive, royalty-bearing licenses to five companies last week. Two of them, Abbott Laboratories of North Chicago, Ill., and Travenol/Genentech Diagnostics of Cambridge, Mass., have broad experience with blood assay development, while three other firms, Electro-Nucleonics, Inc., of Columbia, Md., Litton-Bionetics, Inc., of Kensington, Md., and Biotech Research Laboratories, Inc., of Rockville, Md., have all had direct experience with HTLV viruses through collaborations with Gallo's laboratory. —*D. Franklin*

Angel dust clobbers immune cells

Angel dust is dangerous, and the more that is learned about this widely abused street drug, the nastier it seems. In addition to inducing hallucinations, delusional thinking and schizophrenia-like psychosis, phencyclidine, or PCP as the drug is also known, can derange the function of immunocytes, the body's disease-fighting white blood cells, researchers report.

PCP was used briefly in the late 1950s as an anesthetic, but its bizarre side effects made it unpopular. Those same side effects have stimulated studies of the drug's effect on the nervous system. But no one until now has looked at its effects on the immune system, say H. D. Whitten and colleagues at the Medical University of South Carolina in Charleston.

The researchers bathed several types of immunocytes in a PCP-laced medium and found that the drug slowed antibody production by B cells, and inhibited DNA synthesis and the metabolism of glucose in both B and T cells. Angel dust also cut interleukin-1 (IL-1) production by white blood cells called monocytes. IL-1 prods B cells into their DNA synthesis stage. Thus "PCP acts as an immunodepressant," a finding which has health implications for PCP abusers as well as people given the anesthetic ketamine, a derivative of PCP, the scientists report in the July 6 SCIENCE.

But implications aren't always consequences, and the behavior of cells in laboratory incubators may be different from their mode in their more complex, natural environment. Moreover, the PCP concentrations the cultured cells experienced could differ substantially from what an abuser's blood cells are subject to. The amounts of PCP needed to slow up immunocytes in culture were in some cases a thousand times more than the concentrations measured in users' blood, Whitten says, but those measurements are generally made long after the drug is ingested, and therefore "of course they find very small amounts."

Whether the PCP-related anesthetic ketamine "may contribute to postoperative infection" by suppressing the immune system, as the authors suggest, is speculation. "By and large, ketamine appears to be benign regarding its effect on [the immune system]," says David Eric Lees, professor of anesthesia at Georgetown University in Washington, D.C. Lees wonders if the Carolina group's suspicion of ketamine isn't "the kicker they put in there to catch the editorial interest," but adds that, "if there's really something there on the lab bench, you may want to raise your index of suspicion in the clinical setting ... you're obligated to go ahead and answer the question." The researchers hope to isolate the receptor that binds PCP to immunocytes. —*G. Morse*