

viving cholinergic neurons.

Reisberg agrees that Coyle's hypothesis is one, but only one, of several hypotheses that might explain his findings. Naloxone probably modulates the effects of numerous neurotransmitters, he says, and in addition opiates may act directly—by exciting the hippocampus (the seat of memory) and causing amnesia or by slowing the electrical activity of the cortex.

The same journal issue contains two reports of memory improvement in Alzheimer's patients following treatment with physostigmine, a drug that acts directly on the cholinergic neurotransmitter system. But unlike such drugs, Reisberg reports, naloxone appears to have no serious side-effects. —*W. Herbert*

## Marijuana and the reproductive cycle

Moderate marijuana use may cause a temporary disruption of the menstrual cycle, but this cycle returns to normal in three to four months in rhesus monkeys, whose reproductive system is similar to that of humans. This was one of the conclusions of a seven-year study on the effects of marijuana's psychoactive components on the primate reproductive system.

In the study, Carol Grace Smith and her colleagues gave five monkeys doses of tetrahydrocannabinol (THC), the principal psychoactive component of marijuana. The doses were equivalent to five or six joints a day three times a week, which the researchers called "moderate usage." After the injections, the monkeys failed to ovulate for a period ranging from 103 to 135 days. They then developed a tolerance to the THC and began menstruating normally at usual hormonal levels.

Smith and her colleagues of the Uniformed Services University of the Health Sciences in Bethesda, Md., and Ricardo Asch of the University of Texas in Austin report in the March 25 *SCIENCE* that this tolerance is not metabolic (clearing the body more quickly of THC), since the THC concentrations in the blood remained roughly constant throughout the injection period. Instead, Smith said, "There are nervous pathways into the hypothalamus [a gland that regulates the reproductive cycle] that are being suppressed."

Less rigorous studies in women show a similar menstrual cycle disruption, says Smith, followed by a return to a normal cycle in chronic marijuana users who have developed a tolerance. However, other studies indicate that THC may be directly toxic to the developing egg cell. Smith warns that women who are attempting to conceive or who are pregnant should not use marijuana. There is also evidence that heavy marijuana use might cause serious, possibly irreversible, menstrual disruptions in adolescents, an effect the team has now begun to study. —*A. Chen*

## Immunity syndrome: New test, new ideas

A surprising correlation between a hormone and acquired immune deficiency syndrome (AIDS) provides the basis of a new test that may soon limit the spread of the often fatal condition and also indicates new possibilities for its treatment. A separate discovery of abnormal interferon in some AIDS patients offers yet another view of the disease.

Scientists have identified abnormally high levels of an immune system hormone, called thymosin alpha<sub>1</sub> ( $\alpha_1$ ), both among patients with AIDS and in relatively healthy persons considered at high risk for AIDS because of social characteristics and clinically measured depression of immune system functions. The test employed to identify the hormone in blood is now being adapted for routine clinical use and tested by Roche Biomedical Laboratories, Inc. The drug company plans to have a form of the test available in a few weeks for clinical research use, says James Geyer of the Burlington, N.C., laboratory.

Most common among homosexual males, the disorder appears to be spread by an infectious agent through intimate contact and blood transfusions (SN: 9/25/82, p. 202; 1/1/83, p. 8). Because there may be no symptoms of AIDS for as long as a year after the disease is contracted, apparently healthy sexual partners and blood donors can transmit the disease. So far there is no effective treatment.

The new test, which uses antibodies to label thymosin  $\alpha_1$  with radioactivity, was originally employed in studies of the hormone's levels in aging and in a variety of diseases. Collaborating with Evan M. Hersh at M.D. Anderson Hospital in Houston, Allan L. Goldstein of George Washington University examined blood samples from almost 150 homosexual male patients considered at high risk for AIDS because of deficits in immune system function. The scientists expected to find lowered levels of thymosin  $\alpha_1$ , because many of these patients have decreased numbers of helper T cells, white blood cells that require thymosin  $\alpha_1$  in order to mature. But instead the thymosin  $\alpha_1$  levels were often elevated to almost four times normal. Such high levels are only seen in a few adult leukemias, certain brain tumors and some cases of multiple sclerosis. Thymosin  $\alpha_1$  is not elevated in blood of healthy homosexuals, Goldstein reports.

Scientists at Roche plan to run more than 1,000 blood samples supplied, along with patient histories, by several clinical centers. "We hope to have some definite results in less than a month," Geyer says. "We may be off and running." He expects the test to be widely used in screening donated blood, as well as in early and simplified diagnosis of the syndrome.

The finding of high levels of thymosin  $\alpha_1$  has implications as to the course of AIDS and to potential treatments. Goldstein

suggests that the white blood cells that normally respond to thymosin  $\alpha_1$  may be defective and do not send a feedback signal to make the thymus gland stop producing the hormone. In parallel with certain forms of diabetes, an effective therapy may be to give the patient more hormone. Another possible therapy, suggested by overproduction of the hormone, is to surgically remove much of the thymus. This type of treatment is effective in myasthenia gravis, an autoimmune disease.

Research at New York University Medical School has described components of AIDS that resemble autoimmune diseases. "While AIDS involves a shut-down of cellular immunity, some B cell functions [such as antibody production] certainly are increased," says Jan T. Vilcek. He has discovered an abnormal form of alpha-interferon, a natural disease-fighting substance, in 17 out of 27 homosexual AIDS patients with Kaposi's sarcoma, a cancer that frequently develops in the course of AIDS. He has also found it, but less frequently, among patients with swollen lymph glands, a symptom that may be an early indication of AIDS, and even less frequently among healthy homosexuals. The abnormal interferon was not found in any healthy heterosexuals, but it is found in patients with an autoimmune disease called lupus. —*J.A. Miller*

## New EPA chief nominated

William D. Ruckelshaus, the Environmental Protection Agency's first administrator, has been nominated by President Reagan to succeed Anne McGill Burford as EPA's top official. This proposed return engagement for Ruckelshaus at EPA has won the support of environmentalists and industrialists alike. Reagan describes the 50-year-old lawyer, a senior vice president of Weyerhaeuser Co., as "the right man for the right job at the right time."

Burford, who resigned March 9 under fire, heads a list of current or former Reagan appointees at EPA now under congressional investigation. Many question whether those under investigation were only doing Reagan's bidding; and it is into this limelight that Ruckelshaus has stepped. Claiming he's been offered a "free hand" to deal with the agency and its responsibilities, Ruckelshaus will begin by, in his words, attempting to restore "stability" to the troubled agency.

Though Senate confirmation of Ruckelshaus is not expected to encounter much opposition, environmental groups note they will be looking for signs of whether the agency's founding administrator has in any way compromised his integrity or commitment to environmental protection over the past decade by his representing firms regulated by EPA. □