

researchers found that cholinergic nerve cells on the side of the brain holding the implant increased in size.

Results from the short-term tests do not, however, show that nerve growth factor can improve the ability to learn *new* tasks or stop the gradual deterioration of overall memory, says Björklund.

This report follows an announcement last month that clinical trials are about to begin on another potential drug for Alzheimer's disease. Called tetra-hydro-aminoacridine (THA), the drug was synthesized nearly 80 years ago for other

purposes. Last year, scientists reported that THA had improved memory function in a small group of patients (SN: 11/15/86, p.308). During the two-year clinical trials, about 300 Alzheimer patients will take the drug orally at U.S. research centers. THA is thought to block or slow the breakdown of the acetylcholine. Even if results from the clinical study confirm memory improvement due to the drug, experts have cautioned that THA probably will not stop the progressive destruction of brain cells that is characteristic of Alzheimer's.

— D.D. Edwards

## 'Competition' cause of AIDS dementia?

Structural similarities between AIDS-causing viruses and a protein that stimulates nerve cells may contribute to the dementia common in AIDS patients, and thus may provide a way to reverse that dementia, scientists said last week. The researchers suggest that the similarities create a competition between virus and protein for binding sites on neurons — leading to inhibition of nerve function by the viruses, and in turn causing symptoms associated with dementia.

Since the AIDS-causing HIV-1 virus was first isolated from brain tissue in 1985, there have been multiple reports of the virus found in the nervous system of AIDS patients. Over the same period of time, clinicians began routinely observing AIDS patients for signs of dementia, including memory impairment, apathy and poor concentration. Now recognized in at least two-thirds of AIDS patients, signs of dementia recently were added to a revised definition of the deadly disease (SN: 8/29/87, p.136). But the actual cause of AIDS dementia has been unknown, despite the fact that the amount of HIV-1 in the spinal fluid is related to the severity of dementia.

"Even though there is this dementia in AIDS, it is clear that HIV-1 does not infect the neurons themselves," Mark E. Gurney of the University of Chicago told SCIENCE NEWS. Gurney, co-worker Mark R. Lee and David D. Ho of the Cedars-Sinai Medical Center in Los Angeles studied the interaction between HIV-1 and factors that are known to control neuronal growth and function. What they found, says Gurney, could help explain what is causing AIDS-related dementia.

"[The HIV-1 virus] infects the monocyte cells in the brain," says Gurney. "So how does an infected monocyte, which isn't a nerve cell, cause dementia? There must be an indirect mechanism." That mechanism, Gurney and his coauthors report in the Aug. 28 SCIENCE, may be the competition between the virus and a protein called neuroleukin.

First described by Gurney and others in 1986, neuroleukin is secreted by lymphocyte cells, stimulates antibody production by other blood cells and influences the growth of neurons in embryos. In the recent study, the scientists found that a segment of neuroleukin is very similar in structure to the HIV-1 component called gp 120. Experiments using 10-day-old chick embryos showed that the addition of either whole HIV-1 or gp 120 suppressed the activity of neuroleukin.

According to Gurney, the cause of the dementia in AIDS apparently differs from that of other dementias: "In Alzheimer's, you have actual death of nerve cells, and you don't in AIDS....It's as if the [AIDS-

## Faces of emotion: Social or innate?

It is common finding that, in the United States, females are more facially expressive than males. This advantage now appears to be importantly influenced by cultural factors and social training, since women from Taiwan and mainland China do not show more facial expressiveness than their male counterparts, according to a study reported in New York City this week at the annual meeting of the American Psychological Association.

At the same time, report psychologists Ross Buck and Wan-Cheng Teng of the University of Connecticut in Storrs, there are substantial differences in facial expressiveness between subjects from Taiwan and mainland China. This suggests, in their view, that "political and social changes taking place within a few generations can profoundly affect the spontaneous emotional expressiveness of the population of a nation, with far-reaching personal and cultural consequences."

The researchers showed emotionally loaded color slides to 44 foreign students at the University of Connecticut, 24 from Taiwan and 20 from mainland China. In addition, 20 U.S. students were shown the slides. The slides included scenes of nude males and females, pleasant landscapes, severe burns and facial injuries, unusual photographic effects and people familiar to the students. Unknown to the subjects, their facial and gestural responses to each slide were recorded by a hidden videocamera. Later, after the presence of the camera was revealed and their permission to use the videotapes was granted, each subject attempted to match the appropriate slide to taped facial expressions obtained from the other students.

Among the results: Subjects from all three countries were equally likely to pick the correct slide for facial expressions of both male and female Chinese students; there was a marked advantage in choosing the correct slide for U.S. females' expressions compared with those of U.S. males; and students look-

ing at someone of either sex with pronounced facial expressiveness could identify the appropriate slide regardless of their own cultural background (this ability, however, was stronger for females from each nationality).

The results, although tentative, are consistent with the theory that the ability to interpret spontaneous nonverbal communication is innate and universal to the human species, say the investigators.

Yet the spontaneous facial expressions of Taiwanese students were significantly more indicative of what they were viewing than were the expressions of mainland Chinese students. The greater exposure to worldwide media and emphasis on individuality in Taiwan may promote this difference between people from the same ancient Chinese culture that has split along political and ideological lines, say the Connecticut researchers.

There may be other reasons for the greater expressiveness of the Taiwanese, they add. One of the experimenters was from Taiwan, and relations between Taiwan and the United States have always been cordial, which may have served to make Taiwanese students less defensive and inhibited in the laboratory.

It is also possible, say Buck and Teng, that female subjects in the study were more expressive than they appeared. For example, students from Taiwan and mainland China who rated the videotapes may have expected females to have negative reactions to sexual slides when, in fact, some females may have had positive, amused responses to those scenes. Thus, negative reactions by females may have been pegged inaccurately to viewing a sexual slide.

But for now, say the researchers, it appears that the ability to send spontaneous emotional messages through facial expressions is subject to social influence, while the ability to understand those messages lies outside the social realm.

— B. Bower

related] dementia is a by-product, and the brain is an innocent bystander." The absence of cell death directly due to viruses may mean that the dementia could be reversed, he says.

This premise is supported by results from a recently reported study, in which a small number of AIDS patients treated with the drug zidovudine (formerly known as AZT) showed improvement of dementia. That success, suggests Gurney, may have been due to reduced competition: "If you control the infection, you reduce the gp 120 and the neuroleukin can start acting again."

But Gurney says there are many questions without answers. The current results come from experiments in embryonic, rather than adult, nerve tissue. Neuroleukin's exact role in the adult brain remains unclear. That discrepancy, he says, creates a "weak part in generalizing our results to dementia in adult AIDS patients." He and his co-workers are planning to inject gp 120 into the brains of adult laboratory animals, and watch for signs of dementia. Another question the researchers say must be answered is whether gp 120 also interferes with the immune-system functions of neuroleukin.

— D.D. Edwards

## Hybrid particle mimics AIDS virus

By exploiting peripatetic pieces of yeast's genetic material called retrotransposons, British scientists are hoping to hasten the development of effective AIDS vaccines. "Transposable elements" — DNA segments that readily move from one location on a chromosome to another — were first discovered in maize more than 30 years ago, and later in fruit flies and bacteria. When researchers found several years ago that these restless chunks of DNA can transfer traits like antibiotic resistance between bacteria, they began using them as carriers of foreign DNA in genetic experiments (SN: 10/23/82, p.260).

Scientists at the Oxford-based British Bio-technology Ltd., the University of Oxford and the University of Kent in Canterbury used similar technology in their experiments with yeast retrotransposons, reported in the Sept. 3 NATURE. The retrotransposons code for a group of yeast proteins that assemble themselves into harmless "virus-like particles" — which the researchers have

tricked into accepting segments from the HIV viruses causing AIDS.

These hybrid *faux*-virus particles may be useful in developing both AIDS vaccines and diagnostic tests to detect the HIV viruses, say the scientists. Oxford's Susan M. Kingsman told SCIENCE NEWS that 100 copies of the HIV segments can be incorporated into each "ball of protein" that forms the custom-made particles. The presence of so many repeated units of HIV antigen is likely to elicit better immunity when injected into an animal, she says. Yet-unpublished work by the British researchers suggests that a wide range of proteins, including those from viruses other than HIV, could be inserted into the retrotransposons, says Kingsman.

Noting that the hybrid particles are simple to construct and then purify, the authors also report that rabbits injected with the recombinant particles develop antibodies against the HIV component of the particles, suggesting a "new approach to vaccine production."

— D.D. Edwards

## First test-firing for redesigned shuttle booster rocket



*It may seem like a tiny step in the long line of U.S. space achievements, but this week's test-firing of a redesigned version of the shuttle booster rocket is critical to the resuscitation of the space program, which has suffered a string of mishaps, beginning with the tragic explosion of the space shuttle Challenger on Jan. 28, 1986. Detailed results of the test, which was conducted in the desert near Brigham City, Utah, are expected to be known shortly. Success of the test is crucial if NASA is to meet its target date of June 1988 for the resumption of shuttle flights. Initial responses of*

*officials from NASA and the rocket's manufacturer, Morton Thiokol, Inc., indicated there were no early signs of problems with the firing. The test was postponed for three days due to problems with various electronic and water-cooling systems, which did not relate directly to the performance of the rocket itself. Analysis of the results will focus on whether any exhaust gas leakage occurred in the joints that connect the booster's main segments. Such a leak, in the rubber O-rings that seal the joints, is believed to have triggered the explosion of Challenger.*