Guide to planning human gene therapy

Medical researchers intending to use recombinant DNA to modify cells of human subjects may soon be faced with a hundred questions. Last week, the Federal Register published a proposal likely to become the first national guideline for human gene therapy. The guide was prepared by a subgroup of the National Institutes of Health (NIH) Recombinant DNA Advisory Committee (RAC). At federally supported institutions, including most research hospitals, any work with recombinant DNA in human subjects must be approved by this federal committee, as well as by the Food and Drug Administration. The document, predominantly a list of questions to be addressed by researchers, is modestly entitled "Points to Consider in the Design and Submission of Human Somatic-Cell Gene Therapy Protocols." The committee had decided earlier to limit its current consideration to therapies intended to treat persons with inherited genetic diseases but not produce genetic changes that would be passed on to future generations (SN: 1/5/85, p. 9).

The major objection raised thus far to such experiments is concern that altered genes will find their way into reproductive cells. "The line between somatic and germline genetic engineering might not be as clear as everyone is suggesting," says Jeremy Rifkin of the Washington, D.C.-based Foundation on Economic Trends. "If it is not clear, even somatic engineering raises major ethical questions."

The questions posed by the NIH group range from details of experimental design to consideration of social issues. Some of the questions indicate concern about changes in reproductive cells. Others ask whether the proposed protocol has been tested in animals, and more specifically in nonhuman primates. Still other questions address informed consent, privacy and confidentiality.

The RAC group that drafted the proposed guide is made up of three laboratory scientists, three clinical physicians, three ethicists, three lawyers, two specialists in public policy and a representative of the public.

The document is open to public comment until Feb. 21, and it will be considered at the next RAC meeting, May 3. According to Bernard Talbot of NIH, if the committee and the director of NIH approve the document at that time, the committee will probably begin evaluating the first protocol for human genetic engineering over the summer. "The public review of these protocols," says the document, "will serve to educate the public not only on the technical aspects of the proposals but also on the meaning and significance of the research." —*J. A. Miller*

Nucleosynthesis now

According to astrophysical theory, most of the chemical elements were formed by processes related to stars. The lighter chemical elements, up to the weight of oxygen, are produced in the stellar burning processes through the lifetimes of stars. For heavier elements, theory has recourse to stellar explosions such as supernovas and novas. Whether this theory is correct or not, it is obvious that the heavier elements were made somehow once upon a time. Now, for what seems the first time, there is direct evidence for continuing synthesis of elements of intermediate weight.

At the recent meeting in Tucson, Ariz., of the American Astronomical Society, William A. Mahoney of the Jet Propulsion Laboratory of California Institute of Technology described observations of the proportions of two isotopes of aluminum in interstellar space (where stellar explosions would have left them) that lead to such a conclusion. George B. Field of Harvard University, a specialist in the dynamics of interstellar matter, calls it "an extremely important result."

Mahoney's work was done with a gamma ray spectrometer aboard the satellite HEAO 3. The instrument detected the emission of radioactive aluminum 26. This isotope has a half-life of a million years, so the amount now in interstellar space should represent contributions from thousands of supernovas or millions of novas.

The proportion of aluminum 26 to stable aluminum 27 in interstellar space comes to about 1 in 100,000, the same ratio that is found in inclusions in meteorites. Mahoney figures the total mass of interstellar aluminum 26 to be about three times the mass of the sun. The amount theoretically calculated for supernova production falls short of observations by a factor of 10 to 100. The amount calculated for novas is consistent with observations. —*D.E. Thomsen*

Herpes pill gets OK

The Food and Drug Administration (FDA) this week approved the first pill for genital herpes. The pill contains acyclovir, an antiviral compound that is already used in injectable and ointment forms. The pill is not a cure for herpes. It doesn't eliminate the virus from the body, but it does limit its reproduction. In clinical trials, genital herpes sufferers taking daily pills experienced few, if any, outbreaks. Those who took the drug when sores appeared reported quicker healing. Side effects have been few and minor, but the FDA suggests the drug not be used for longer than six months at a time until more is known about it. □

Computers and kids: Learning to think

An Apple a week can help a first-grader to solve some types of problems better, but it will not improve the child's general learning and thinking abilities — at least not when the Apple is a computer, according to two researchers.

Douglas H. Clements and Dominic F. Gullo of Kent State University in Kent, Ohio, say that 6-year-olds who program an Apple II computer in two 40-minute sessions a week for 12 weeks show improvement on two types of thinking tests, while youngsters receiving computer-based arithmetic and reading lessons do not significantly improve on the same tests. The children who programmed using the computer language Logo increased their scores on a creativity test in which they had a limited time to devise and draw pictures. They also became better at identifying when they had not been given enough information to complete a simple task or understand how a magic trick is performed. These tasks, says Clements, measure a child's ability to monitor and evaluate his or her thinking.

But a number of other tests provided no evidence that 12 weeks of programming experience can improve overall thinking abilities, the investigators report in the December JOURNAL OF EDUCATIONAL PSYCHOLOGY. Scores in the two groups were about the same for tasks in which familiar objects and shapes are sorted according to common attributes, a series of objects is ordered by length and memory is tested for words, pictures and numbers.

The sample was composed of 18 first-graders from a middle-class, midwestern school system. They were randomly assigned to one of the two computer groups.

Larger samples should be studied, acknowledges Clements, but research in this area is younger than the children under study. A few investigators have examined 12-year-olds, he says. Their work indicates that youngsters can increase their problem-solving ability after learning to program with Logo, but the skills each child can develop vary considerably.

"We weren't testing for achievement," explains Clements. "We found that computer programming fostered creativity and the ability to think about your own thinking. It did not result in any revolutionary changes in a child's cognitive development."

In contrast to instructional programs, Logo programming requires advance planning, reflection on one's thinking and analysis of errors. These factors may have been crucial for the 6-year-olds' performance in parts of the study. Clements is now collecting similar data on the same children, who have entered third grade, to see if the programming effects have persisted.

—*B. Bower*