
Marrow transplants: Ethical questions

Although bone marrow transplants have extended the lives of some terminally ill leukemia patients, they have failed to benefit many others. In some instances, the transplants can cause graft-versus-host disease or serious infections that are just as life-threatening as the cancer they are supposed to cure. So the transplants present an ethical dilemma: Should they be considered the best available, and hence accepted, therapy for terminally ill leukemia patients, or should they be considered experimental therapy? This dilemma, in fact, has gotten transplant scientists at the University of California at Los Angeles School of Medicine into hot water with the school's Human Subject Protection Committee, whose job under university and federal regulations is to ensure that the potential benefits of any human experiment outweigh the risks and that the patient is fully informed.

In 1979, the committee learned from nurses on the school's medical wards, that Robert P. Gale, Martin J. Cline (the first researcher to use gene-splicing techniques on humans, see SN: 10/18/80, p. 245) and other investigators at the school had performed bone marrow transplants on dying leukemia patients without the committee's approval. Medical school dean Sherman Mellinkoff confirmed the researchers' infraction and last summer warned them that if they didn't get the committee's approval for future similar transplants, both the medical school and the National Institutes of Health would withdraw funds for their transplant research. The investigators are now obtaining such approval. □

A little mass for the photon, maybe

During the past year, there has been a great fuss over the possibility that one of the massless particles of physics, the neutrino, has some rest mass. Now, Joel R. Primack and Mark A. Sher of the University of California at Santa Cruz suggest that another one, the photon, may have a small rest mass, possibly on the order of a ten-thousandth of an electron-volt.

The photon is electromagnetic radiation of all kinds. It embodies the forces of electromagnetism. Its masslessness is demanded and guaranteed by many of the most important rules in modern physics. To suddenly give it rest mass seems disastrous, except that that happens only at cryogenic temperatures.

The rules depend on what theorists call the symmetries of electromagnetic phenomena, and giving the photon rest mass would be the result of a break in those

symmetries. Symmetry breaking seems to be a result of a drop in temperature. At room temperature, we see certain classes of phenomena that represent different mathematically classifiable symmetry patterns. Theorists tend to believe that the distinctions between these patterns arose by a process of symmetry breaking. In the distant past, when the temperature of the cosmos was much higher, two or three of what are now separate classes of phenomena called electromagnetic, weak interaction or strong interaction were united in a single symmetry pattern. As the universe cooled, that symmetry broke, and relative simplicity developed into the present complexity.

If we cool things below the present temperature of the cosmos, the 3K of the cosmic blackbody radiation, we could get another symmetry break, one in the present symmetry of electromagnetism. Primack and Sher suggest that will happen, and that the photon will get a rest mass from it. We can't cool the whole universe, but experimenters can cool small regions to see if the photon has some rest mass under those conditions. This is a practical approach because more and more of our solid-state physics is being done at temperatures below 3K. □

Study quells dioxin tie to birth hazards

A four-year study conducted by Dow Chemical Co. finds no link between the occupational exposure of male employees to dioxin and reproductive problems experienced by their wives. Dioxin is a contaminant in several pesticides, including 2,4,5-T and Agent Orange.

Previous studies involving laboratory animals have shown that, even in small doses, exposure to the potent chemical causes birth defects, miscarriages and tumors. Last year, the chemical was also linked with cancer (SN: 4/12/80, p. 230).

The Dow study, released last week, surveyed the reproductive history of 370 women whose husbands may have been exposed to dioxin at work. Findings were compared with those for a group of 345 women whose husbands never received occupational exposures to the chemical. Results showed no statistically significant differences between the groups regarding rates of miscarriage, stillbirths, infant deaths or congenital malformations. The Environmental Protection Agency has not yet reviewed the study.

EPA suspended most uses of 2,4,5-T early in 1979 after a study signalled a possible epidemic of miscarriages among women in Alsea, Ore. (SN: 3/17/79, p. 166). The town bordered forests sprayed with the herbicide, and peaks in the observed miscarriage rate followed by two or three months the periods of 2,4,5-T spraying. Dow is fighting the EPA suspension. □

Auto-immune factor eyed in diabetes

The elusive role of the immune system in insulin-dependent diabetes, long suspected by researchers, is slowly being pinned down. In 1978, University of Chicago researchers found that some insulin-dependent (juvenile) diabetics have antibodies that damage the insulin-producing beta cells of rat pancreases (SN: 9/9/78, p. 182). Now, Michael J. Dobersen, Joshua E. Scharff, Fredda Ginsberg-Fellner and Abner Louis Notkins of the National Institute of Dental Research have identified antibodies in juvenile diabetics to the surface and interior of the insulin-producing cells. But whether these antibodies are a cause or result of diabetes remains to be seen.

The researchers report in the Dec. 25 NEW ENGLAND JOURNAL OF MEDICINE that they found an antibody active against material within pancreatic cells, but this antibody was not active against pancreas cells in culture. The cell surface antibody, present in 23 of the 36 juvenile diabetics they tested, wiped out the cultured cells. Neither of the antibodies was found in persons with adult-onset diabetes or with no diabetes, but curiously, 25 percent of the patients' diabetes-free relatives had the cell surface antibody, and it was capable of destroying pancreas cells.

Determining the role of the antibodies will be the real trick. They may play a causative role. They may be a result of diabetes. A third possibility the researchers are considering: A trigger, such as a virus, may have an antigen similar to something on the surface of insulin-producing cells; an immune reaction against the virus gets pancreatic cells as well. □

Milk ups lead absorption

The lactose in milk serves as the major carbohydrate source for suckling mammals and facilitates the absorption of necessary minerals. Unfortunately, it also facilitates the absorption of lead, an unnecessary and toxic mineral, report University of Wisconsin researchers Philip Bushnell and Hector DeLuca in the Jan. 2 SCIENCE.

Bushnell and DeLuca fed rats roughly as much lactose as the animals ingest normally and found that as they increased the lactose, the rats absorbed more lead and had more lead in their tissues.

Milk has other components which can protect against lead retention, so that in the absence of lead ingestion, there will be a net lead loss. This explains why milk, once used by some industries as a prophylactic for workers chronically exposed to lead, has received both good and bad grades as a lead poisoning preventive, Bushnell and DeLuca note. □