

AIDS: Education, testing continued

With October officially designated AIDS Awareness and Prevention Month, the federal government has launched its massive education campaign called "America Responds to AIDS." The goal is to "blanket the nation with accurate AIDS information," according to a statement from the U.S. Department of Health and Human Services last week. While the education effort presses on, so do AIDS research and politics.

- Despite the justifiable fear of AIDS, the overall prevalence of infection in the general population remains low. This, say scientists at Harvard University, makes the controversial concept of mandatory premarital screening for the AIDS virus "a relatively ineffective and inefficient use of resources." Reporting in the Oct. 2 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, the researchers estimate the number of people who would have to be tested under such a program, as well as the number of infections that might be prevented.

They conclude that if mandatory premarital screening were in place with currently available tests — which can yield both false positives and false negatives — the program would detect fewer than 0.1 percent of infected individuals and cost "substantially more" than \$100 million annually. They also say that mandatory premarital screening for syphilis — begun in the mid-1930s and cited to by those supporting an AIDS program — has been "judged to be ineffective and unnecessary." Voluntary testing, education and counseling are the best ways to stop AIDS in low-prevalence populations, say the scientists.

- Impatient with the federal process used to evaluate new drugs for use in AIDS patients, the State of California has decided to create its own system for testing AIDS drugs. Last week, the state legislature approved the plan, which officials there said would be based on the process followed by the Food and Drug Administration (FDA), but would provide quicker results. The FDA announced in March that certain investigational drugs — including those for AIDS — might be used in patients without passing through the time-consuming channels normally needed for approval (SN: 3/21/87, p.189).

- More public funding will be flowing to groups engaged in AIDS research, with the recent announcement that under so-called cooperative agreements the federal government has awarded \$10 million to 11 research groups across the United States. The cooperative agreements differ from the standard funding process of contracts and grants by allowing the group receiving the funds to manage the research, and the government to coordinate exchange of information among the scientists involved. Administered by the National Institute of Allergy and Infectious Diseases in Bethesda, Md., the National Cooperative Drug Discovery Group Program was created in 1986 to encourage joint AIDS research by academic and industrial partners. With the latest award, expected funding for the program through 1992 totals \$68 million.

Bifocal lenses implanted for cataracts

Physicians have placed artificial lenses into the eyes of cataract patients for more than a decade to clarify distant vision, but eyeglasses or contact lenses still have been needed to help correct close vision. That may no longer be necessary if a new bifocal lens implanted by surgeons in Columbus, Ohio, last month proves successful. Implantation of the plastic lenses into two patients at Ohio State University marked the beginning of clinical trials just approved by the FDA. Unlike the currently available lens, used in 1 million patients each year, the new lens should correct both near and distant vision if placed correctly, say the physicians who performed the surgery. Although this is the first time the lens has been used in the United States, clinical trials in England have been under way for more than a year, reportedly with positive results.

Chemistry at periodic table's edge

Element 105 (dubbed hahnium by U.S. researchers and nielsbohrium by the Soviets), at the outer reaches of the periodic table, is one of the more reluctant elements when it comes to revealing its chemical properties. For one thing, its half-life is a fleeting 35 seconds; for another, it's extremely hard to produce. When Darleane Hoffman and her colleagues at Lawrence Berkeley (Calif.) Laboratory recently produced it by bombarding berkelium-249 with oxygen-18 ions, they created only 47 hahnium-262 isotopes in 800 experiments.

The researchers, who used a rapid chemical separation technique, now report they have made the first observations of hahnium's chemical properties in solution. The technique involves collecting the berkelium reaction products on a microscope cover slip and adding nitric acid. This turns hahnium into an insoluble complex that sticks to the glass surface while the other products are washed away. "The beauty of this separation method is that you can do it very rapidly [in 50 seconds] because it's quite simple," says Hoffman.

The fact that hahnium in solution adheres to glass shows that it behaves like niobium and tantalum — hahnium's lighter-weight Group V cousins. It also suggests that hahnium, like the Group V elements, has a +5 oxidation state, which would confirm an earlier prediction that elements 89 to 103 to the left of hahnium on the periodic table exhibit very different chemical properties from elements 104 and 105.

A new relative humidity sensor

Whether in the textile or semiconductor industry, uncontrolled humidity can dampen productivity. Unfortunately, many commercial humidity sensors — mainly polymers coated with sulfonic acid — suffer from hysteresis, in which the polymer becomes so saturated with water at high humidity levels that it is unable to perform well at lower ones.

Peter H. Huang at the National Bureau of Standards in Gaithersburg, Md., has received a patent for a humidity sensor that significantly reduces this problem. It should also last longer and operate at higher temperatures and humidities than conventional sensors. His device consists of a halogenated polymer (such as Teflon) coated by a mixture of a strong and a weak acid, typically sulfonic and carboxylic acid.

Because the strong sulfonic acid has a greater affinity for water molecules than does carboxylic acid, Huang can control the amount of water absorbed and released by the polymer — ensuring that it doesn't get saturated — by fixing the ratio between the two acids. For example, relatively more carboxylic acid would be used for high-humidity applications and relatively less for detecting minute changes in low humidity levels. Huang says relative humidity is proportional to the polymer's water content, which can be measured electrically, optically or acoustically or by weight.

Plastic wrap: What's that musty smell?

Plastic wrap for food is meant to be barely seen and certainly not smelled. But recently Kraft Inc. found that a shipment of plastic film provided by their supplier had a "musty" odor that would have tainted their food products. With a series of chromatographic, spectroscopic and synthetic techniques — coupled with the use of their noses — chemists at Kraft's Basic Flavor group in Glenview, Ill., found the culprit: 4,4,6-trimethyl-1,3-dioxane, formed by the reaction between formaldehyde and a solvent coating used to help ink adhere to the film. "This analytical approach illustrates how an arsenal of sophisticated methods may be used to solve a real-world analytical problem," write Robert J. McGorin, Thomas R. Pofahl and William R. Croasmun in the Sept. 15 *ANALYTICAL CHEMISTRY*.