Biomedicine

Joanne Silberner reports from Minneapolis at the Interscience Conference on Antimicrobial Agents and Chemotherapy

Kinderhealth

Good news and bad news from the day care front: Researchers have shown that unvaccinated children are in little or no danger of catching chicken pox from companions inoculated with a live-virus vaccine, but a separate study indicates they are in danger of catching other infections in a day care center.

Stephen A. Chartrand of the University of South Alabama in Mobile and his colleagues at New York University and Washington University in St. Louis wanted to know if, in the close confines of a day care environment, the live, attenuated virus used in a chicken pox vaccine (not yet on the market) could jump from a vaccinated child to a nonvaccinated child. Chartrand and his co-workers vaccinated 34 healthy children in a day care center; they found no spread of the virus to the children's contacts and no side effects to the vaccine.

While chicken pox itself is generally not serious, it prevents children who have it from attending day care for several weeks, leaving parents in the lurch; it is associated with about a quarter of the cases of Reye's syndrome; and it can have serious effects in children with leukemia, and in adults. If a vaccine developed by Merck Sharp & Dohme in West Point, Pa., continues to prove safe and effective, it may receive federal approval soon.

Less reassuring is a study by the Centers for Disease Control (CDC) in Atlanta, which found that one-third of upper respiratory infections and two-thirds of the ear infections suffered by children who attend day care were associated with day care.

"We're not trying to indict day care," says David W. Fleming of the CDC. "But you have a dilemma. When you get kids together the transmission of disease is going to be facilitated."

Though a higher rate of colds and flu among children in day care is common knowledge, there are few details available on the magnitude of the problem, Fleming says. He and his coworkers contacted 449 Atlanta-area mothers of children under 5; the women were from diverse socioeconomic backgrounds. The researchers asked them about day care attendance, breastfeeding history, parental age, race, education, socioeconomic status, smoking history, household details and whether the children had been ill in the past two weeks.

They found that day care, maternal smoking and crowded conditions in the home were all related to a higher incidence of infection. Specifically, children in day care had 1.7 times the rate of upper respiratory infections as children not in day care.

The next step, says Fleming, is to compare day care centers with low and high rates of infection to see what's behind the difference.

Complexing AIDS

Many AIDS victims develop anemia, and the blood transfusions they receive often cause more of an improvement than would be expected just from treating the anemia. Researchers from St. Luke's-Roosevelt Hospital Medical Center in New York City have an explanation for the observation, and have found that transfusing patients more frequently than would be the case for anemia can prolong their lives.

People with AIDS have abnormally high levels of circulating immune complexes — agglomerations of antibodies and antigens. The complexes are usually removed by red blood cells that bind to them and take them to the liver for processing, says George F. McKinley of St. Luke's. When AIDS patients are transfused with packed red cells, the number of complexes, which probably include AIDS viruses, goes down in five days.

He and his colleagues tried more frequent transfusions to reduce the complexes in 21 patients; the mean survival after diagnosis was 370 days, compared with 249 days for control patients who received a conventional number of transfusions. Eventually the transfusions stop reducing the number of complexes. "It's not a cure," says McKinley, "but it is a delay."

Chemistry

Patents for seeds and plants

Plants, seeds and plant tissue cultures are now eligible for patent protection, according to the U.S. Board of Patent Appeals and Interferences. Formerly, patent protection was limited to plant varieties reproducing asexually and to single, novel varieties of sexually reproducing plants. It did not allow patents on seeds and tissue cultures or patents covering a given modification in any variety.

The policy reversal came in response to a case brought by Kenneth A. Hibberd of Molecular Genetics, Inc., in Minnetonka, Minn. The company had applied for a patent on new corn seeds and plants having high levels of tryptophan, an amino acid that is deficient in all natural varieties of corn. The company plans to produce corn with improved nutritional value for livestock feed.

"Novel, man-made plants, seeds and plant tissue cultures will now be accorded the same protection as live, man-made microorganisms, which were the subject of another landmark decision [by the 1980 Supreme Court]," says Franklin Pass of Molecular Genetics.

The plant patent decision is considered crucial to the application of biotechnology to agriculture. S. Leslie Misrock, the lawyer who represented Molecular Genetics, says, "Without such patent protection, the risks of undertaking plant research would be too great and the rewards too small to provide adequate incentive to pursue such research. This [decision] will transform the seed industry from a commodity into a specialty products business."

On the road to deliberate release

The Environmental Protection Agency (EPA) is on the verge of approving for the first time a field test of a live genetically engineered microorganism. The decision is on an experiment proposed by Advanced Genetic Sciences of Greenwich, Conn., that will employ bacteria genetically engineered to prevent frost formation on crop plants (SN: 8/27/83, p. 132). "The odds are extremely good we will be approving it in less than a month," Steven Schatzow of EPA told a meeting in Washington, D.C., of the Industrial Biotechnology Association. He expects that approval to be subject to litigation, as was the earlier approval of a similar experiment by the National Institutes of Health (SN: 3/9/85, p. 148). But, he adds, "I don't intend to lose that lawsuit."

Chemistry research: Invest for rewards

A survey of chemistry — billed as the first comprehensive examination of the field in 20 years—recommends a doubling of federal funding of basic chemical research. The National Academy of Sciences report, based on contributions by 350 research chemists, describes "the many remarkable developments" that have resulted from recent chemical investigations. "Their report shows that chemistry is a central science that provides fundamental understanding needed to deal with most of society's needs," says George C. Pimentel, chair of the survey committee and a chemist at the University of California at Berkeley.

The report describes intellectual and practical opportunities that are now open to chemistry. These include new catalytic processes and products, environmentally safe agricultural products and new deliberately designed drugs. These opportunities stem from an array of powerful instruments, including lasers, computers and nuclear magnetic resonance, X-ray and mass spectrometers. The report also notes that the U.S. chemical industry employs more than 1 million people, and more than 20 percent of the gross national product is related to chemical catalysis alone.

"The current federal investment," Pimentel says, "is rooted in a funding pattern appropriate to a test tube and bunsen burner era that no longer exists."