

Spray vaccine for German measles

Since German measles is a major cause of birth defects in unborn children (SN: 1/12/74, p. 20), protecting fetuses from the disease is vital. This means the more children vaccinated against German measles the better.

Although an injectable vaccine is available, immunization by throat spray would be ideal. It would prevent the dissemination of the German measles virus from nose and throat into the community, thus reducing the hazards to pregnant women. It would also be a painless way to mass-vaccinate children. So Rama Ganguly, Brigitte Durrer and Robert H. Waldman of the University of Florida College of Medicine decided to see whether respiratory tract vaccination of young children might be as effective as an injectable vaccine.

They gave 75 preschool children a vaccine by injection or by spray. They found that the spray elicited antibodies in the blood four to six weeks later—antibody activity comparable to the injectable vaccine. Side effects from the spray vaccine were also uncommon and mild.

Smoke gets their dander up

Lymphocytes are major cellular components of the immune system. B cells make antibodies. T cells attack "the enemy" directly. Which kind of cell is the most prevalent in the blood or lungs of smokers compared with nonsmokers? G. A. Warr and his microbiology team at Baylor College of Medicine set out to find the answer.

They found that about half the lymphocytes in the blood of both smokers and nonsmokers were T cells and about 15 to 20 percent were B cells. The remaining lymphocytes were not identifiable. In nonsmokers, 18 percent of lung lymphocytes were T cells and three percent B cells; the rest were questionable. In smokers, 43 percent of lung lymphocytes were T cells and five percent were B cells; the rest were questionable.

These results suggest that smoking has minimal effects on the immune fighters in the blood, but that it does increase fighters in the lungs, especially T cells. In fact Warr and his colleagues found that the total number of lung lymphocytes from smokers was 30 percent higher than those from nonsmokers.

Spray vaccine for strep throat

Strep throats, characterized by sore throat, fever, headache and vomiting, are especially common in young people. Sometimes they lead to heart or kidney damage or even death. An injectable vaccine against strep is available.

Now a spray vaccine of comparable effectiveness has been developed by Eugene N. Fox, a University of Chicago microbiologist. The spray vaccine should prove superior to the injectable vaccine by preventing transmission of upper respiratory streptococci—the bacteria that cause strep throats. In other words, the vaccine should protect not just the person who is vaccinated but other people as well.

Fox and his co-workers gave the spray vaccine to 21 volunteers ages 18 to 25 and a placebo to 23 volunteers serving as controls. The volunteers receive the vaccine or a placebo in three doses at monthly intervals. Then the throats of all the volunteers were challenged with streptococci. Some 75 percent of unprotected controls experienced positive throat cultures accompanied by some degree of illness, whereas only 25 percent of the immunized subjects became ill from exposure to the bacteria.

Immunizing lobsters

Mariculture—the artificial cultivation of ocean animals for food—is one of the more promising areas of oceanic research. The Office of Sea Grant of the National Oceanic and Atmospheric Administration has been pumping millions of dollars into it (SN: 9/23/72, p. 204). As mariculture becomes more important in food production, keeping marine stocks healthy will be significant.

With this fact in mind, Frank Steenbergen and Harriette Schapiro, marine scientists at San Diego State University, have shown that a bacterium that causes the lobster disease gaffkemia can infect the California spiny lobster, an economically important species. They have also successfully immunized the spiny lobster against the disease, using a live attenuated strain of the bacterium.

Recycled sewage and pathogens

The water supply in Hawaii is limited. The Board of Water Supply of the City and County of Honolulu has predicted that a water shortage will occur on the island of Oahu by 1986 unless some steps are taken to conserve water. An obvious step would be to reclaim sewage water through recycling. So the Water Resources Research Center of the University of Hawaii has been engaged during the past two years in a multi-disciplinary pilot field study to evaluate the feasibility of the direct reuse of treated-sewage effluents for irrigation. Roger Fujioka and Philip C. Loh, virologists at the university, were charged with seeing whether existing sewage contains viruses harmful to humans.

They sampled raw sewage and found that the samples contained dangerous pathogens, notably polio viruses and coxsackie viruses. The latter can cause respiratory diseases, stomach upsets, even fatal heart damage. They also found that the Hawaiian soil has high adsorptive capacities for the viruses in the sewage. Polio viruses remained alive for at least 32 days in the soil.

"Pathogenic human enteric viruses can survive the current method of sewage treatment which included a final disinfection with chlorine," Fujioka and Loh concluded. "The discharge of such treated sewage effluents into the environment can inevitably result in the pollution of the receiving waters and/or lands with human pathogenic viruses. Any future plan to utilize recycled sewage water must, therefore, consider this very important problem. . . ."

Human viruses found in fish

If fish aren't polluted by industrial chemicals that are harmful to human health, they may very well be contaminated with human viruses present in contaminated waters, Eric R. Brown and his microbiology colleagues at Chicago Medical School have found.

Using the contaminated water from the Fox River near Chicago as a test system, they found an unprecedented number of human bacteria and viruses, especially during the summer months. The organisms included large numbers of human polio viruses, coxsackie viruses and rheo viruses (which cause mild respiratory infections). Polio and coxsackie viruses could be isolated from the guts of fish caught near sewer outlets extending from cities such as Elgin, Aurora and Montgomery. Carp were especially susceptible.

"The finding of viruses in a river system used for commerce and sport, and in fish such as carp, indicate the potential health hazards to the million-and-one-half users of the water system," Brown and his co-workers conclude.