Conquered turns in *Legionella* labyrinth

Microbiologists recently added several pieces of information to the Legionnaires' disease bacterium puzzle. The latest bits of data help to focus the still somewhat sketchy picture of *Legionella pneumophila* — a pathogen that causes annually about 25,000 cases of a severe form of pneumonia first recognized when it struck 221 persons and claimed 34 lives at and near the 1976 Philadelphia American Legion convention (SN: 8/14/76, p. 102; 1/29/77, p. 69; 1/20/79, p. 41).

Working on the human environment portion of the *Legionella* puzzle, Samuel C. Silverstein and Marcus A. Horwitz recently reported that the bacterium multiplies intracellularly in monocytes — white blood cells that normally defend the body against bacterial infections. Although other pathogenic bacteria — pathogens that cause tuberculosis and leprosy, for example — grow within monocytes, the *Legionella* bacterium is unique in that it grows in monocyte vacuoles (fluid- or air-filled spaces in cell protoplasm) lined with ribosomes, the cellular organelles where proteins are manufactured.

"We have never seen another intracellular pathogen that grows within a vacuole lined with ribosomes," Silverstein says. "It suggests that maybe the cell [the monocyte] is induced to synthesize proteins that are required for the growth of the *Legionella* or are required to maintain the vacuole in which it grows."

Silverstein and Horwitz of Rockefeller University in New York City also have investigated other aspects of the human immune system in relation to Legionnaires' disease. They have found, among other things, that the *Legionella* bacterium is not effectively killed by polymorphonuclear leukocytes (polys) — another type of white blood cell.

Moreover, the researchers suspect that cell-mediated immunity (as opposed to humoral, or circulating antibody, immunity) is involved in defending the body against the disease. "Clearly, most of the people who have been seriously ill with Legionnaires' disease are individuals who are immunocompromised (patients with suppressed cell-mediated immunity)," Silverstein explains. That immunosuppression may be a significant risk factor in developing Legionnaires' disease is illustrated by the 1977 case cluster in kidney-transplant (drug-induced immunocompromised) patients at the Veterans Administration Wadsworth Medical Center in Los Angeles, as reported by Sydney M. Finegold and Richard D. Meyer in the 1980 ANNUAL REVIEW OF MEDICINE.

While Silverstein and Horwitz are concentrating on the *Legionella*'s human habitat, other researchers are investigating the bacterium's lifestyle in lakes, rivers and cooling towers. Carl B. Fliermans of the Department of Energy's Savannah River Plant in Aiken, S.C., has found that *Legionella* is a part of the normal bacteria population of lakes and rivers where it has a close relationship with a common form of blue-green algae. Describing his study at the recent annual American Society for Microbiology meeting in Miami Beach, Fliermans said the algae's normal life processes supply all of the nutrients needed by the *Legionella* bacterium.

Another participant in the microbiology meeting, Richard D. Miller of the University of Louisville in Kentucky, reported that eight specific amino acids are needed in a medium for the Legionnaires' bacterium to grow — "basic information," he says, "to use on down the road." □

Don't overestimate the power of diet

The people who brought you the Recommended Daily Allowances for essential nutrients hold that scientific information is not yet adequate to provide much in further guidelines for a healthful diet to prevent disease. The National Research Council's Food and Nutrition Board cautions against "the flood of dietary recommendations currently being made to the American public." Alfred E. Harper, chairman of the group, told reporters that the board wants to allay the general apprehension about food contributing to degenerative disease. After two years of preparation, the board has released a report concluding that adults should select a nutritionally adequate diet of the four food groups, select a wide variety of foods, adjust caloric intake to avoid obesity and reduce salt intake.

The guidelines are more limited than those that have been presented by other groups (SN: 10/13/79, p. 249). For instance, the board does not recommend reduction of cholesterol in the diet, except for the small fraction of the population at high risk for heart disease, because clinical intervention trials have been disappointing, Harper says. In addition, he worries about nutritional inadequacies of many low cholesterol diets. Nor is the board concerned about sugar in the diet, beyond its contribution to obesity and its substitution for nutritionally important food in low calorie diets.

The board does recommend that many Americans decrease salt intake from the average of 10 grams per day to 3 to 8 grams to reduce risk of hypertension. Because the normal daily diet, including processed foods, has 5 to 6 grams of "nondiscretionary" salt, the board recommends no salt be added in cooking or at the table.

The only recommendation Harper feels should be made to the food industry is to try for lower salt and lower calorie products. □

Toxic-shock cases: A staph syndrome?

Officials at the Center for Disease Control in Atlanta, Ga., report a possible increased incidence of toxic-shock syndrome — a disease characterized by high fever, vomiting and diarrhea and, ultimately, severe prolonged shock and hypotension (low blood pressure).

First described by James K. Todd (of the University of Colorado) and colleagues in the Nov. 25, 1978, LANCET, the disease has struck at least 55 persons in 15 states since October 1979. Of these cases, 52 were female and between 13 and 52 years of age; the mean age among females was 25 years old. The mortality rate in the 55 cases was 13 percent.

CDC epidemiologist Kathy Shands says although the precise etiology of the disease is not yet understood, researchers suspect it is caused by "a toxin elaborated by bacteria." This means that rather than directly attacking the body in large numbers, a bacterium produces a toxin that spreads throughout the body. Tetanus and diphtheria, for example, are caused in such a manner.

The suspect bacterium in toxic-shock syndrome, says Shands, is *Staphylococcus aureus*. But because the culprit staph has not yet been confirmed, doctors can treat only symptoms of the syndrome. □

New journal

Historically, psychiatry's alliance with much of the rest of the medical profession has been, at best, shaky. "It would be not only heartening, but charitable, to believe that psychiatry has found a welcome place in the general hospital...," writes psychiatrist Don R. Lipsitt, editor-in-chief of GENERAL HOSPITAL PSYCHIATRY, a new quarterly journal aimed at promoting "psychiatry's educational imperative in the new frontiers of medicine." Lipsitt, chief of psychiatry at Mount Auburn Hospital in Cambridge, Mass., and associate professor of psychiatry at Harvard University, acknowledges the job will not be easy. "The joining of the trickling tributary of psychiatry to the majestic mainstream of medicine has long had the character of a rivulet flowing uphill," he writes. Nevertheless, the widespread closing and de-emphasis of mental institutions around the United States accompanied by other "economic concerns" has spawned what Lipsitt calls "the proliferation of psychiatric inpatient units in general hospitals." This dictates a renewed effort to more closely integrate psychiatry into the treatment of the "whole patient," Lipsitt emphasizes in the latest issue (March, 1980). GENERAL HOSPITAL PSYCHIATRY is published by Elsevier North Holland, Inc., New York, N.Y. □