

Science focuses on heart infections

A form of heart disease that afflicts 13,000 Americans annually is infectious endocarditis — disease-causing infection of a heart valve. The latest knowledge about the causes and treatments of this disease was aired at the recent American Heart Association's 55th Scientific Sessions in Dallas, Tex.

Two conditions appear to set the stage for the disease, reported Merle Sande of San Francisco General Hospital. First a person must acquire a large number of a pathogen — usually streptococci bacteria — in his bloodstream. He can get this from a variety of sources — a tooth extraction, urological surgery, teeth cleaning, gum chewing, teeth gritting, massaging a boil and using dirty needles. The pathogens must then settle on a heart valve that has been damaged, say by rheumatic fever. The pathogens use a molecule called dextran to adhere to the damaged heart valve.

Although infectious endocarditis has almost always in the past been fatal, today patients have a good chance of being successfully cured of the infection with antibiotics, George G. Jackson of the University of Illinois Medical Center in Chicago pointed out. On the other hand, even if the infection is cured, it can leave scars on the heart valve, and the scars can lead to heart

failure and the danger of death. When infectious endocarditis leads to heart failure, surgical replacement of the defective valve is necessary, reported Donald Magilligan Jr. of Henry Ford Hospital in Detroit.

But a new valve doesn't guarantee patients' survival. There is an 11 percent chance of death from complications surrounding valve replacement, Magilligan has determined. And if they survive the surgery they may still acquire new infectious endocarditis and die from that. What's more, valve replacement in such patients is prohibitively expensive—about \$40,000. The reason, Magilligan explained, isn't because the replacement costs more than other kinds of heart surgery. Rather, it's because a patient must stay in the hospital six weeks instead of the usual one.

These factors among others, Magilligan believes, stand as a challenge for society and health care providers to prevent infectious endocarditis wherever possible. For instance, physicians can prescribe antibiotics for persons with known heart valve defects before they undergo tooth pulling or some other procedure that introduces pathogens into their bloodstreams. The antibiotics should then kill the pathogens before they reach the vulnerable heart valve. In fact, because tooth extraction introduces many pathogens into the bloodstream, persons without known heart valve defects might also profit from taking antibiotics before having a tooth pulled, Jackson suggests. —J.A. Treichel

Hold the starch: Diet aids may not work

Disappointing news for overweight pasta lovers: Starch blockers — which were widely sold as weight-control tablets earlier this year — do not appear to inhibit the digestion and absorption of starch calories in humans after all, according to the results of a recent study reported by George W. Bo-Linn and colleagues of Baylor University Medical Center in Dallas, Tex., in the Dec. 2 *NEW ENGLAND JOURNAL OF MEDICINE*.

Starch blockers, mostly extracts of kidney (or other) beans, were sold nationwide with claims that they block the activity of alpha amylase, an enzyme needed to digest starch. Each starch blocker tablet was said to produce enough anti-amylase activity to block the digestion and absorption of 100 grams (400 kilocalories) of starch. Thus, persons with a passion for bread, spaghetti and potatoes should take the nonprescription diet aid with their meals, advertisements urged.

This weight-control concept appealed to the public: It is estimated that more than 1 million starch blocker tablets were consumed daily in the United States in the first part of this year. By summer, however, the Food and Drug Administration learned that some users of the product were experiencing severe constipation, nausea and vomiting (SN: 7/24/82, p. 58). Eventu-

ally, FDA ruled that the product is a drug, not a food as its manufacturers had contended, and can no longer be sold until its safety and effectiveness are proved.

Previous claims of efficacy were based in part on a German study in which humans ingesting an amylase inhibitor along with a meal containing 100 grams of starch displayed a blood-glucose level response suggestive of an inhibition of starch digestion. Results from the recent Baylor study, the only other known published investigation of anti-amylase activity in humans, conflict with those earlier findings.

The Baylor researchers fed high-starch (100 gram) spaghetti meals to five healthy volunteers, who ranged in age from 25 to 34 years. The volunteers ate that same meal once accompanied by three starch blocker tablets and once accompanied by placebo tablets. Analyses of stool samples indicated that after the "starch blocker meal," subjects excreted no more calories than they did after the "placebo meal." In other words, subjects absorbed about the same amount of calories with and without starch blockers.

Bo-Linn and colleagues speculate that starch blocker failure may result because the amount of amylase the pancreas secretes after a meal far exceeds the amount the tablets can inhibit. —L. Garmon

Chemical mobilizes soldier bug

A chemical dinner bell may sound for spined soldier bugs as farmers lure this predator to dine on insect pests. U.S. Department of Agriculture scientist Jeffrey R. Aldrich has developed an attractant, a blend of five commercially available compounds, that seems irresistible to the predatory insect.

The half-inch-long soldier bug, also known as a stink bug, is appealing because it feeds on more than a hundred insects, including the cotton bollworm, gypsy moth and other pests. It preferentially favours the larval form, which is generally the life stage that does the most damage. Previous attempts to use soldier bugs failed because the predators, happy to eat non-pest as well as pest insects, moved out of targeted areas. Treating pest-infested fields with the attractant is expected to induce the bugs to stay. Wider field tests will determine how the chemicals may be most efficiently applied.

Aldrich analyzed the chemicals released by male spined soldier bugs and matched them in his blend. It includes leaf aldehyde, alpha-terpineol, benzyl alcohol, linalool and terpinen-4-ol.



Spined soldier bug attacks insect pest.

Attracting a predator is a new strategy in control of insect pests. The soldier bug attractant is the first pheromone formulated for an insect predator and the first for the insect group called true bugs, Aldrich says. In other cases, using pest insect pheromones to trap adults or interfere with their reproduction usually has a delayed effect on the destructive population. "By contrast, using pheromones to increase the predator population in an infested field or garden would have an immediate impact," he says.

With the tool of a predator attractant, farmers could protect predator insects by temporarily luring them away from a field before spraying it with insecticide. Because the pheromone also attracts flies that parasitize soldier bugs, special traps might specifically kill the parasites. Aldrich also envisions contaminating trapped soldier bugs with disease microorganisms that infest a specific pest. Such manipulations of insect predators, parasites and pathogens may be "a harbinger of our future battle strategies," he says. —J.A. Miller