

Bugged by cat allergies?

If your allergy to cats sends you fleeing, your body may be objecting not to the pet but to its fleas, observes entomologist Richard J. Brenner of the Agriculture Department's Medical and Veterinary Entomology Research Lab in Gainesville, Fla.

Allergists have long puzzled over why some people exhibit allergy symptoms upon exposure to someone else's dog or cat but not their own. The difference could be the presence of fleas on the unfamiliar animal, Brenner's new data indicate.

Many people are allergic to proteins in the saliva of fleas — which explains why the critters' bite can trigger a runny nose and watery eyes. Now, Brenner's team has identified two flea-related proteins that can elicit allergic responses. Both come from flea debris: feces, eggshells, molted skin, and lost body parts. The Gainesville scientists harvested these allergens from house dust vacuumed from the bedding, furniture, and carpeting of flea-ridden homes.

Researchers at the University of South Florida's College of Medicine and James A. Haley Veterans Hospital, both in Tampa, tested the proteins on 48 allergy-prone individuals. The study found that 12.5 percent reacted to the flea-debris proteins. To Brenner, the new data confirm that fleas are not just a nuisance, but a health concern.

Better than oat bran

In 1990, chemists at the National Center for Agricultural Utilization Research in Peoria, Ill., unveiled Oatrim (SN: 5/26/90, p.330), a food additive rich in beta-glucan, the cholesterol-lowering ingredient in oat bran. At the time, George E. Inglett, its developer, predicted that when substituted for some of the fat or fiber in baked goods, the product would offer health benefits. He was right, data from the first clinical trial involving the product indicate.

For 10 weeks, nutritionist Kay Behall and her colleagues at the Beltsville (Md.) Agricultural Research Center (BARC) administered Oatrim-enriched diets to 24 volunteers with high concentrations of cholesterol in their blood. Dietitians incorporated about one-half cup of the powdery product in various foods that the men and women ate each day — from cookies and pancakes to gelatin, spaghetti sauces, and fruit juices.

Two different Oatrim formulations were investigated, according to a preliminary report in the December AGRICULTURAL RESEARCH. During the first half of the trial, volunteers' diets included Oatrim containing either 1 percent or 10 percent beta-glucan by weight. After five weeks, the BARC team switched each group's diet.

Both formulations achieved comparable 8 percent reductions in the volunteers' total cholesterol and 10 percent drops in low-density lipoprotein (LDL) cholesterol (the so-called bad cholesterol). Moreover, volunteers' glucose concentrations dropped by 7 to 12 percent on the Oatrim-enriched diets. This could prove a benefit to diabetics and other individuals who have trouble controlling concentrations of sugar in the blood.

But the big surprise was Oatrim's effect on weight, according to BARC biologist Daniel Scholfield. Despite volunteers' slight increase in calorie intake, he notes, they lost an average of 4.5 pounds each over the course of the trial. Moreover, because Oatrim swells like a sponge when it encounters water, it tends to be filling. Indeed, "nobody in the test complained about being hungry," notes Judith Hallfrisch, BARC's head of carbohydrate research. These findings indicate that Oatrim-modified recipes should be able to "replace fat and lower overall calorie intake without a loss of satiety," she says.

The Agriculture Department, which patented Oatrim, has issued licenses to two manufacturing partnerships for the commercial production of Oatrim-fortified foods. Some 40 different products are currently under development.

Adam and Eve — bit by little bit

To determine what is normal, physicians who peer inside the body often must compare what they see against some standard reference. In the past, these have tended to be wall charts, plastic models, or textbooks. Increasingly, however, research groups are developing computerized atlases — three-dimensional road maps of the body. A single keystroke on a computer can retrieve portrayals of any part of the anatomy from any desired angle. While these references can offer unparalleled detail and versatility, the best of them today cover only very small portions of the body, such as the brain (SN: 12/11/93, p.392).

One reason for this is the lack of high-resolution digital data for the entire body. The National Library of Medicine (NLM) in Bethesda, Md., hopes to overcome this obstacle soon, according to Michael J. Ackerman. He coordinates NLM's "Adam and Eve project" — the head-to-toe mapping of a man and a woman.

The effort has already produced a complete X-ray atlas of "Adam." Compiled using computerized axial tomography (CAT) scans, each of its 1,735 cross-sectional images corresponds to a different 1-millimeter-thick "slice" through the body, Ackerman explains. A related set of soft-tissue maps — each representing a 3-mm-thick cross section — has been collected using magnetic resonance imaging. Currently, researchers at the University of Denver are physically cutting Adam, a frozen cadaver, into sequential slices and photographing each in full color. These also will be converted to digital form.

When completed this spring, the resulting 20-gigabyte file will be indexed, making it possible for users to home in on discrete regions of the body, such as the eye or heart.

The entire block of data will be available to anyone with a computer powerful enough to load and use it. Those with access to Internet, Ackerman says, can download the data free of charge. NLM also expects to prepare what Ackerman's team jokingly refers to as a "lite" edition of the file. Small enough to fit on one or two CD-ROM disks, this scaled-down version will serve users with smaller computers.

Though a candidate Eve has already been chosen, Ackerman says that NLM won't commit itself to using this cadaver until researchers have finished with Adam. Like Adam, the final selection of an Eve won't be based on race, height, weight, or external comeliness. The cadavers are instead being chosen to represent healthy people generally.

Ackerman predicts that if these anatomical data prove useful, NLM will develop other, similar resources. Indeed, he says, NLM "hopes to build an entire digital library for medicine" — encompassing all developmental stages, from infancy through old age — that will exhibit the complex changes and pathologies that define humanity.

Developing Pan-American science

Latin America and the Caribbean lag far behind industrialized nations in science "and the gap seems to be increasing," observes a new 144-page report published by the American Association for the Advancement of Science (AAAS) in Washington, D.C. The report finds that Latin American and Caribbean nations have only one-tenth as many scientists per capita as developed countries, suffer an even more acute shortfall of engineers and technicians, and possess a weak research infrastructure.

A new hemisphere-wide "scientific bloc," linking U.S. and Canadian scientists with their southern counterparts, could "speed up the entire region's economic recovery," the report asserts. It offers recommendations for achieving that goal through a program that AAAS will coordinate and staff. One suggestion: the creation of a "government-independent," Pan-American version of the National Science Foundation to fund research and training throughout the region.