Soaring pterosaur!

Next spring, for the first time in more than 65 million years, the flapping shadow of a giant prehistoric flying reptile will be cast on the ground. No, scientists have not cloned the genes of the pterosaur *Quetzalcoatlus northropi*. Instead, the Smithsonian's Air and Space Museum in Washington, D.C., has secured funding to build a full-scale, radio-controlled flying replica of the largest animal ever to fly.

According to the plans, the replica, with about a 36-foot wingspan, will fly realistically, propelling itself by wing flapping. It will be built by AeroVironment, Inc., of Monrovia, Calif., an innovative-aircraft design company. AeroVironment is directed by Paul MacCready, who has developed such human-powered aircraft as the Gossamer Condor and the Gossamer Albatross, which flew across the English Channel, and the solar-powered Gossamer Penguin and Solar Challenger (SN: 6/14/80, p. 373). The major funding for the $400,000 pterosaur project will come from Johnson Wax of Racine, Wis. The museum plans to fly the replica in Washington, beginning in spring 1986, to call attention to a new film about flight. The museum says it "hopes the project will make a significant contribution to the fields of aerodynamics and paleontology."

Human peptides to the defense

Three molecules capable of a broad range of antibiotic activities have been discovered in human white blood cells. Each molecule is a chain of about 30 amino acids folded into a complex shape held by three internal bridges. Because these peptides appear to play a role in preventing and overcoming infections, the scientists have named them "defensins." Tomas Ganz, Robert I. Lehrer and colleagues at the University of California at Los Angeles described the human defensins last week at the meeting in Anaheim, Calif., of the Federation of American Societies for Experimental Biology.

The cells containing defensins are neutrophils, the most abundant white cells circulating in the blood. These cells are attracted to sites of infection, where they engulf, kill and digest invading microbes. Scientists have recently determined several processes involved in this defense. For example, after ingesting microbes, neutrophils produce hydrogen peroxide and convert some of it to hypochlorous acid and chloramines, which are disinfectant chemicals.

"But it has been clear that's not the whole story," Lehrer told SCIENCE NEWS. "There is also something in neutrophils intrinsically active against microorganisms." Lehrer and his colleagues first characterized defensins in rabbit blood cells, and now in human cells. There appears to be no similarity in the amino acid sequence between the mammalian defensins and previously characterized peptide antibiotics produced by microbes. "What's unusual about the defensins is their broad spectrum of activity," Lehrer says. "They are active against bacteria, fungi and viruses, unlike conventional [microbial] antibiotics, which are more specific."

The UCLA scientists are now determining how the defensins act. They suggest that work with defensins will lead to a better understanding of how the body resists infection and to the design of new antibiotics for clinical use.

Comments on cabinet gene-splice plan

April 15 ended the public comment period on the biotechnology policy proposed last December by a White House Cabinet Council. In brief, that proposal said that no new U.S. laws were necessary to regulate the commercialization of biotechnology; various agencies could divide responsibility according to product uses and review products and processes on a case-by-case basis using scientific advisory boards and regulatory bodies coordinated by interagency panels (SN: 1/5/85, p. 7). Response to the proposal has been generally favorable, Bernadine Healy of the Executive Office of Science and Technology Policy (OSTP) told a congressional hearing last week.

The OSTP received 85 comments, the greatest number from industry or industrial and professional groups (41) and from university members (23). According to Healy, industry expressed concern about the time and cost of complying with the regulatory process, and several commentors requested that advisory committees include members of public interest groups, industry and nonscientists.

The most extensive criticism, submitted April 15, came from a public interest organization, the Environmental Policy Institute (EPI) of Washington, D.C. "We believe that this document [the biotechnology proposal] is, first of all, premature, and secondly, is inadequate and incomplete," Jack Doyle of EPI told the hearing. The institute recommends that before any federal agency or congressional action to adopt a regulatory biotechnology framework, and before any agency approves field tests of gene-spliced organisms, the National Academy of Sciences should conduct a study on environmental and public health implications of genetic engineering. Such a study would be expected to take one to two years. Then, EPI says, Congress should review the Academy report for its legislative ramifications. Doyle says the current proposal reflects "an increasing sense of confused responsibility in the federal establishment."

Field tests inch toward EPA approval

The Environmental Protection Agency has completed its evaluation of three of the first notifications it has received of proposed field tests of genetically engineered microbes. In each case, the agency decided that an "Experimental Use Permit" (EUP) must be obtained from EPA before testing begins.

Although EPA does not usually require such permits for small-scale field tests of pesticides, the agency is "concerned that nonindigenous and/or genetically altered microbial pesticides may replicate and spread beyond the site of application with potential adverse effects," Steven Schatzow, director of EPA's Office of Pesticide Programs, told a congressional subcommittee. EPA has asked for additional specific information from the Monsanto Co. of St. Louis, which wants to test a soil bacterium engineered to carry an insecticide (SN: 12/15/84, p. 373), as well as from Steven Lindow of the University of California at Berkeley and from Advanced Genetic Systems, a Berkeley company—both have proposed tests of a bacterium intended to protect crops from frost damage (SN: 8/27/83, p. 132). Previous approval to Lindow by the National Institutes of Health Recombinant DNA Advisory Committee has been tied up in litigation (SN: 3/9/85, p. 148).

"We're obviously a little disappointed," says David Crosson of Monsanto. "We had planned on going to field in May. Now we assume there will be a delay, but we don't know how much." The Monsanto research team is planning to meet with EPA officials to determine whether additional experiments will be necessary, or whether the regulators' questions can be answered from the 800 pages of information already submitted. Crosson says that by requiring an experimental use permit, EPA sets additional reporting requirements and obtains some inspection rights.

"The decision to require an EUP would ensure that testing will be conducted in a manner least likely to result in unreasonable adverse effects on the environment," Schatzow says. "... the types of information required also would be supportive of future product registration." Schatzow told SCIENCE NEWS, "[Applying for an EUP] should not be a particularly onerous burden. If they provide the information to meet our concerns, it will be approved."