

Biotechnology down the drain

The powerful forces of modern biology have been focused on a down-to-earth problem—the hair-clogged bathroom drain. As a result, Genex Corporation in Rockville, Md., announces an enzyme-based liquid drain cleaner. “We came to develop the drain cleaner by imagining how to tackle scientifically the problem of degrading hair,” says Dick Roblin of Genex.

According to Genex, the new drain cleaner does not contain strong acids, caustics or solvents and does not generate the intense heat common to some cleaners. Chemicals in the product, called Proto, unravel hair strands; then the strands are broken down by an enzyme, alkaline protease, harvested from *Bacillus* bacteria. The company has cloned the gene for the enzyme and anticipates making alkaline protease by recombinant DNA techniques once the Environmental Protection Agency establishes guidelines for use of products of genetic engineering, Roblin says. Genex is targeting the industrial and institutional market for the initial sales of Proto. The company sees Proto as the first of a new line of biotechnology-based cleaning products.

Genetics of odor-blindness

Some people find the steroid androstenone, presented in a laboratory test, to be foul smelling, resembling stale urine or strong sweat. Others report a subtle, even pleasant smell, while still others—approximately 50 percent of the people sampled—report that the chemical has no odor at all. Now scientists at the Monell Chemical Senses Center in Philadelphia, Pa., report that the ability to smell androstenone is genetically determined. Among identical twins, either both members of a twin pair smell the steroid or both do not, whereas only 60 percent of fraternal twins agree on whether androstenone is odoriferous.

“The nature of olfactory receptors and the mechanisms by which the myriad of odors are discriminated and recognized remain elusive,” say Charles J. Wysocki and Gary K. Beauchamp in the August PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES (No. 15). “Investigations that use genetic variation could offer a new tool for studies of olfactory transduction [signal initiating] mechanisms,” they suggest.

Scientists do not yet know whether odor recognition depends on a diversity of receptors (as in the immune system) or on combinational perception by a small number of receptor types (as in the visual system). Studies of individuals insensitive to particular odors may resolve this question. The reasons behind the large range of sensitivity to androstenone are unclear, but Wysocki and Beauchamp mention a controversial proposal that the human steroid acts as a chemical signal of sexually relevant messages.

Growth hormone for sturdier piglets

One to three baby pigs in a litter of 10 die before weaning. Among the major causes of death are low blood sugar levels at birth and an inability to compete with larger littermates for nourishment. Preliminary tests by R. Dean Boyd of Cornell University in Ithaca, N.Y., indicate that growth hormone can combat this serious economic loss for U.S. swine farmers. Sows given growth hormone injections daily during the last two weeks of pregnancy produced piglets with greater energy reserves—higher levels of glucose and free fatty acids in the blood—and the sows' milk production and the fat levels in milk increased. These experiments used small amounts of growth hormone isolated from pig pituitary glands, but more abundant material, produced with genetic engineering techniques, soon should be available. “There is good evidence that growth hormone is a key hormone directing nutrients during critical periods such as late pregnancy and lactation,” says Boyd. “These results suggest that the potential for decreasing pig mortality is very good.”

SEPTEMBER 1, 1984

A matter of control

It's one of those things that make sense intuitively—replace insulin in diabetics who have low insulin levels in a way similar to what the well-functioning body does, and maybe the long-term side effects of the disease can be avoided. But such “close control” is one of the most hotly debated issues in diabetes care, because despite sophisticated new insulin infusion methods, the advantages have never been rigorously proven.

A report in the Aug. 9 NEW ENGLAND JOURNAL OF MEDICINE from nine universities and hospitals in the United States, Canada and England levels somewhat of a blow to the close-control proponents. Of 68 diabetics, the 34 who wore little pumps that continuously infused them with insulin showed “slightly more deterioration” in their retinas than the 34 who got daily injections. Diabetic retinopathy is one of the major complications of diabetes and can lead to blindness.

The study was conducted over eight months, and, the researchers note, “the long-term outcome may be quite different.” What the study indicates, they say, is a need for longer trials.

Expanding in vitro fertilization

For the second time, the British have apparently achieved a first in out-of-body conception—they were the first to use in vitro fertilization in infertile women, and now a London obstetrician has announced that the procedure has been used to counter male infertility. Malcolm Whitehead of King's College Hospital told reporters that sperm surgically removed from a man with blocked vas deferens tubes—the route sperm take from testes to penis—was successfully used to fertilize an egg from the man's wife, and that the resulting embryo “took.”

“If that's an honest description, that's a breakthrough,” says Tom Chang of the in vitro fertilization clinic at Johns Hopkins Hospital in Baltimore. The challenge, he says, will be in obtaining viable sperm from men with blocked tubes.

In the new procedure, the sperm are removed from before the block in the vas deferens via a small incision in the testes, and the healthiest are used for fertilization.

Whitehead says that preference will be given to men whose vasa deferentia have been blocked since birth or because of disease, though it can also be used for vasectomized men.

In 1978, British researchers Robert Edwards and Patrick Steptoe announced the birth of a baby from Lesley Brown, a woman with no fallopian tubes to carry an egg into the uterus. They removed an egg from her surgically, combined it with sperm from her husband, and planted the result in her womb. Since then in vitro fertilization clinics have sprouted up across the United States to help women with blocked fallopian tubes and other reproductive problems conceive.

Easter egg blues

The Easter bunny, customarily an agent of goodness and bounty, brought a basket of something else to several hundred California children last year: food poisoning. Researchers from several California public health institutions report in the Aug. 24/31 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION that 29 of 850 children who attended a 1983 Easter egg hunt in Stanislaus County wound up in an emergency room; after surveying some of the other children, they estimated that over 300 were affected. All the children recovered within a few hours.

The incident, which the researchers deem “an extraordinary episode of mass food poisoning,” was caused by the handling of the eggs and could have been avoided, they say. The heat and the vinegar wash used in preparing the eggs promoted absorption of *Staphylococcus* bacteria being shed by the cook. Had the eggs been refrigerated after dyeing, the food-poisoning bacteria would not have gotten the chance to multiply.

137