Biomedicine

Joanne Silberner reports from the 7th International Congress of Endocrinology in Quebec City

A hormone for all reasons

Luteinizing hormone releasing hormone (LHRH) seems like one of those all-purpose wonder gadgets advertised on late night television, but instead of slicing, dicing and pureeing, the hormone is being touted as a contraceptive for both males and females (SN: 5/24/80, p. 333), and a treatment for prostate cancer (SN: 3/27/82, p. 215) and breast cancer (SN: 3/26/83, p. 203).

Ebo Nieschlag of the University of Münster in West Germany reported on his laboratory's work with LHRH as a male contraceptive. The initial understanding of LHRH was that analogues to it would stimulate fertility, since LHRH causes the release of two pituitary hormones that circulate around to the gonads, causing the release of fertility-controlling sex hormones. Agents that block LHRH, it was thought, would inhibit fertility. But now the thought is that high doses of LHRH or similar molecules "down-regulate" the pituitary, reducing the gonad-stimulating pituitary hormones.

The 11 men in Nieschlag's study wore belts with a pump that constantly infused LHRH under the skin. "We did not achieve azoospermia [no sperm]," Nieschlag reports, "but we suppressed spermatogenesis." To counter LHRH's libido-damping effect, they also administered testosterone. The West Germans are now adjusting the dosage in an attempt to shut down sperm production completely, and are looking for easier ways to deliver a constant dose of an LHRH analogue.

Jan Klijn and colleagues of Erasmus University in Rotterdam tested LHRH analogues on premenopausal women with breast cancer. In much the same way it suppresses testosterone, the releasing hormone suppresses estrogen, and the hope is that it will choke off estrogen-dependent breast tumor cells. About half of all breast cancers are believed to be estrogen-dependent. Nine of 22 women in Klijn's test responded to the treatment — they have been free of metastases for up to 31 months, he says. Treatment, which Klijn says is needed throughout life, throws the women into menopause, so most of them had hot flushes.

Fernand Labrie and colleagues at Laval University in Quebec City are one of a number of groups looking at LHRH for prostate cancer, expected to be the leading cancer in men by the year 2000. Castration and estrogen treatment are used to get at the testosterone-dependent prostate cancer cells, but, says Labrie, the effect only lasts six months to two years, and when the cancer returns it kills 50 percent of its victims within two years.

Labrie has over 300 people enrolled in his study, and of the 30 who have been taking LHRH analogues for two years, only one patient has died. Eighteen hospitals in the United States are evaluating LHRH for prostate cancer. Another 50 hospitals will begin testing it in November, Labrie says.

Hot flushes occur in about 50 percent of the men, and about 60 percent report decreased libido. They can have sex, Labrie reports, but it takes more time. "It's surprising how well you can do without male hormone," he says. "You need it at one stage of life, but after that, if you have a good memory...."

Cottonseed contraceptive update

Gossypol, a constituent of cottonseed oil, is having no problems stopping fertility in men, but about 10 percent of them fail to regain their fertility when they stop taking it, says Guo-Zhen Liu of Capital Hospital in Beijing. This is not a problem in China, he notes. "These patients did not complain. They said, 'Good, I don't have to take any pills anymore.'" Gossypol also lowers potassium level in the blood, Liu says, which may be more of a problem to the Chinese. They have a low dietary intake and consequently low blood levels to begin with, Liu says.

Low potassium causes fatigue, a contraceptive in itself but hardly a satisfactory mechanism. The Chinese are now testing gossypol used in conjunction with potassium supplements and a potassium preserving agent in 120 volunteers.

Science & Society

Fewer apples in the future?

The Environmental Protection Agency (EPA) is looking for data about the plant growth regulator and pesticide daminozide, a potential carcinogen that the agency began a "special review" of last week. A ban on the product would leave scantier apple and peanut harvests that would cost farmers up to $40.7 million in lost crops annually "for at least three or four years," says Al Heier of the EPA in Washington, D.C.

"The lifetime dietary risks from residues on both raw and processed foods may be high," Heier says. "Continued use of this product may result in an unreasonable risk to public health."

Daminozide is a systemic pesticide first registered for use on vegetables, fruits and some shrubs in 1963. Now about 825,000 pounds of it are used yearly, mainly for apples and peanuts. But 1977-78 studies on mice and rats show that the pesticide causes cancerous tumors, Heier says. Plus, he adds, the product breaks down after use into known carcinogen 1, 1-dimethylhydrazine.

As a growth regulator, daminozide extends harvest periods, delaying the ripening process without affecting crop quality. A decision on daminozide's fate is expected within 18 months.

EPA looks at landfill leaks

It's hard to say whether the nation's 1,500 landfill operators are letting hazardous wastes leak into the groundwater; operators monitor themselves for leaks, and don't necessarily do a good job of it, according to Environmental Protection Agency officials. The EPA plans to crack down on operators, with step one, a policy of issuing permits to landfill operators, to begin next year.

Under the 1976 Hazardous Waste Law, operators work under loose standards. They submit a yearly report to the EPA and are required to monitor their own dumps for leaks into groundwater. Groundwater supplies half the drinking water in the United States. But self-monitoring has not worked out well. Office of Solid Waste Director John Skinner says typical testing mistakes include sampling wells in the wrong spots, contaminated samples and improperly gathered data. But under new proposals for permits, operators would not do their own testing.

Aspartame furor dies down

A consumer group says it's too early to tell whether they'll get their wish for a congressional investigation into how and why the low-calorie sweetener aspartame was approved for soft drink consumption by the Food and Drug Administration (FDA).

This month, Washington, D.C.-based Common Cause challenged the FDA's 1983 approval of NutraSweet (aspartame), saying their investigation showed studies suggesting the sweetener could cause brain damage, cancer and other health problems. Florence Graves of Common Cause says her investigation also shows that NutraSweet manufacturer G.D. Searle & Co. may not have produced valid safety tests on the sweetener. Aspartame has been controversial for 10 years, Graves says, which makes the FDA approval curious.

"That [FDA approval] is the only area we want investigated. We are not in a position to call for anything else," says Virginia Sassaman of Common Cause. According to the FDA and Searle, Common Cause is not even in a position to ask for that much.

"This [aspartame safety] has been studied and re-studied since it was discovered in 1965," says Emil Corwin of the FDA in Washington, D.C. "Scientific studies are supportive of the FDA decision to approve it," Corwin says.

A statement on behalf of Searle by public relations firm Burson-Marsteller in Washington says the company "stands behind the safety of aspartame. Issues raised by Common Cause were considered, addressed and resolved prior to FDA approval." More than 100 studies on the sweetener's safety, most funded by Searle, were reviewed by independent scientists.