# DDT may foster breast cancer, study finds

A new study finds that women who develop breast cancer tend to carry higher residues of DDT in their blood than do women free of the disease. Like certain other chlorinated organic chemicals, DDT – and its persistent breakdown product, DDE – can mimic the effects of estrogen, a hormone that many breast cancers need for growth. Exposure to low levels of DDE and other widespread organochlorines may help explain the rising breast cancer rates in recent decades (SN: 4/21/90, p.245), conclude the study's authors.

Once stored in body fat, DDE tends to remain there for years, in some cases a lifetime. The United States banned DDT in 1972, but trace levels of the pesticide persist in food to this day. U.S. adults with DDT in their tissues and blood probably were exposed to the pesticide in its heyday, says epidemiologist Walter J. Rogan of the National Institute of Environmental Health Sciences in Research Triangle Park, N.C. DDT was "ubiquitous in the 60's," he recalls. Some kids "were dusted with it."

The women were part of the New York University Women's Health Study, which enrolled 14,290 area women between 1985 and 1991 in a prospective investigation of breast cancer's possible link to hormones, diet, and the environment. Fifty-eight women were diagnosed with breast cancer within six months of entering the study. They were matched with 171 cancer-free participants on the basis of such factors as menopausal status, age, and education.

Researchers found that DDE concentrations were approximately 35 percent higher in women with cancer than in those without. Indeed, report Mary S. Wolff of Mount Sinai School of Medicine in New York City and her co-workers in the April 21 JOURNAL OF THE NATIONAL CANCER INSTITUTE, women with just 19 parts per billion (ppb) of DDE faced four times the cancer risk as women with 2 ppb.

Though cancer patients also tended to have higher concentrations of polychlorinated biphenyls (PCBs), a trace contaminant in some foods, the increase proved statistically insignificant. PCBs' possible link to cancer weakened even further when the researchers accounted for a woman's DDE levels.

These preliminary data "should serve as a wake-up call for further research," according to David J. Hunter and Karl T. Kelsey of Harvard School of Public Health in Boston. In an accompanying editorial, they say that although the study looked at a relatively small number of women, it "is important because it included adjustment for known risk factors and mutual adjustment for DDE and PCB levels."

The new findings are plausible scientifically, Hunter and Kelsey say. Another chlorinated compound, dioxin, exhibits hormone-like effects in animals by binding to the Ah receptor in cells (SN: 1/11/92, p.26) and triggering everything from immune suppression and tumors to cleft palates. DDT and PCBs can activate enzyme production in people through a mechanism "similar to that of dioxins [by binding] to an Ah-like receptor," the Harvard team notes.

In humans, DDE and certain other chlorinated organics may act as surrogates for steroid hormones. "We have some evidence that at the levels found in the body, [DDE and PCBs] might be acting as estrogens," says Rogan. A 1987 study by his group showed that residues of these compounds apparently decrease a woman's ability to produce milk, much as estrogen does. Moreover, he notes, if organochlorine-fostered cancers "were an estrogen-mediated effect, I would expect PCBs to be less effective [than DDE]," as they were in the new study.

However, he cautions, because so little is known about human effects of DDE and PCBs, such compounds might just as easily trigger tumors by nonestrogenic means. *– J. Raloff*

# Neandertal neck bone sparks cross talk

A small, U-shaped neck bone found in 1988 among the remains of a 60,000-year-old Neandertal skeleton in Israel continues to generate heated debate over the extent to which Neandertals could talk. Two opposing views of the tiny fossil's linguistic implications emerged at the annual meeting of the American Association of Physical Anthropologists in Toronto last week.

Comparison of the bone, known as the hyoid, across different mammalian groups indicates that its shape alone says nothing about the capacity of a Neandertal or any other creature to speak, contend Joy S. Reidenberg and Jeffrey T. Laitman, anatomists at Mount Sinai School of Medicine in New York City. David W. Frayer of the University of Kansas in Lawrence disagrees. He says Reidenberg and Laitman use misleading measures that mask the close resemblance of the fossil to modern human hyoids.

"This fossil has literally set us at each other's throats," Laitman says.

The debate carries over from a related dispute about how to measure the degree of bend in the base of a fossil skull (SN: 4/11/92, p.230). Frayer identified an arched cranial base on four European Neandertals, suggesting they had speech capacities equivalent to ours; Laitman reported greater cranial base flattening among Neandertals than among modern humans.

In their new study, the Mount Sinai investigators took measurements of hyoid shape and size from a variety of mammals, including humans, apes, gibbons, baboons, dogs, sheep, pigs, rabbits, rats, dolphins, and whales.

Considerable variation in hyoid shape appeared, both among species and among individuals in the same species, Reidenberg says. Even within species that exhibit little variation in the neck position of the hyoid, individuals display marked differences in the bone's shape, suggesting that the shape of a single hyoid offers no clues as to where it sat in the neck, she asserts.

Further analysis found marked overlap between human and pig hyoids on four of six measures of shape and size, Reidenberg says. Pig hyoids overlap with the Neandertal specimen on two of those measures, she holds.

The discoverers of the Neandertal hyoid reported that the specimen overlaps with modern human hyoids on five of the same six measures (SN: 7/8/89, p.24).

Despite the anatomical ties between pig and human hyoids, only humans possess a voice box positioned low in the neck and a vocal tract capable of producing speech sounds, Reidenberg says. Thus, researchers should not assume that the fossil hyoid's shape announces an advanced capacity for speech among Neandertals, she concludes.

Frayer also compared pig and human hyoids. Shape differences are readily apparent and seem to stem from the bone's contrasting functions in pigs and humans, he argues. Reidenberg and Laitman's focus on a few discrete features rather than the whole bone may mask these divergences, in his view.

The Neandertal hyoid is "indistinguishable" from those of modern humans, Frayer contends.

The fossil's shape does not establish where the Neandertal voice box lay, he adds. But Frayer deems Reidenberg and Laitman's data "irrelevant."

Other researchers have theorized that the cold, dry climate faced by European Neandertals forced them to breathe extensively through the nose and to evolve expanded nasal cavities. This process may have constricted the Neandertal vocal tract somewhat, Laitman proposes.

"In my opinion, Neandertals are us, but with a twist," he argues. "The upper respiratory system may be the key to understanding that twist." *– B. Bower*



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