

Biomedicine

From the annual meeting of the American Association for Cancer Research in New Orleans

Gene therapy for breast, ovarian cancer

A novel gene therapy technique may one day hold out promise for women with breast or ovarian cancer.

Naoto T. Ueno of the University of Texas M.D. Anderson Cancer Center in Houston and his colleagues knew that 20 to 30 percent of ovarian and breast cancer patients have a gene, called *HER-2/neu*, that is hyperactive. They also knew that women with this overactive gene tend to have a poor therapeutic outlook. "The cancer is aggressive," Ueno says.

The team wanted to see if it could slow the cancer by countering the action of *HER-2/neu* in cancer cells. To do that, the researchers turned to another gene, *EIA*, which is thought to work by turning off *HER-2/neu*. They had previously used the *EIA* gene to treat mice with ovarian cancer.

The Texas team recruited 12 people with advanced ovarian or breast cancer. Each recruit received weekly injections of a solution of fatty particles, called liposomes, that contained the *EIA* gene.

Not only did the gene get into each patient's cancer cells, Ueno reported at the meeting, it dampened the activity of *HER-2/neu* in those cells. Moreover, several people's cancer showed signs of becoming less widespread, he says.

"We're very excited by the findings," Ueno says. However, the group must conduct further studies in order to document that the method has an antitumor effect, he cautions. —K.F.

Raspberry-rich diet forestalls cancer in rats

Black raspberries are a summer treat that's hard to resist. Now, a study suggests that they may help ward off a cancer of the digestive tract.

Laura Ann Kresty of the Ohio State University College of Medicine in Columbus and her colleagues induced cancer of the esophagus in rats by treating them with a tumor-causing chemical. The researchers then put freeze-dried black raspberries into the rat chow. They discovered that rats fed a diet containing 5 percent raspberries had a 38.7 percent decrease in the number of esophageal tumors. Those fed a diet with 10 percent black raspberries showed a 48.9 percent drop in such cancers.

The researchers believe that something in black raspberries, possibly ellagic acid, may help prevent cancer of the esophagus. Ellagic acid "works as an antioxidant," Kresty says. Antioxidants help disable damaging molecules that can trigger a malignancy.

Kresty says that nuts and various fruits contain ellagic acid. Berries are particularly rich in the substance. The team plans to investigate whether strawberries have the same effect as black raspberries. —K.F.

Arsenic: A novel cancer remedy?

The deadly poison arsenic may prove a remedy for one type of cancer. Raymond P. Warrell Jr. of the Memorial Sloan-Kettering Cancer Center in New York and his colleagues have given a low-dose arsenic treatment to 10 people suffering from a white blood cell cancer known as acute myelogenous leukemia.

That experimental treatment spurred a complete remission—the disappearance of all visible signs of cancer—in 8 of the 10 people in the pilot study, the researchers found. Arsenic didn't work for everyone, however. The condition of the two people who did not experience remission had initially improved with the therapy, but they suffered a relapse and subsequently died of cancer, says Warrell.

The drug seems to act by telling cancerous cells to commit suicide, he says. The treatment provoked just mild side effects, such as light-headedness and aches.

At least one patient in the study has been free of cancer for 5 months. Despite the encouraging results, Warrell says that no one knows whether that reprieve will last. —K.F.

Chemistry

From a meeting in Dallas of the American Chemical Society

Friends, elephants: Lend me your ears

If you could talk to animals, you might learn that their languages consist of chemical signals instead of words. With this in mind, Ashley C. Guinn and Thomas E. Goodwin of Hendrix College in Conway, Ark., have been decoding the chemical communication of elephants living at a sanctuary in nearby Greenbriar.

The researchers collected samples of the pungent liquid secreted by glands near the elephants' ears and analyzed them with a technique that chemically separates and identifies the components. They found several compounds, called sesquiterpene alcohols, never before seen in mammals, although one of the substances does occur naturally in a Greek tobacco, Guinn says. The team also proposes a way that elephants could biochemically synthesize the compound from other chemicals in their bodies.

Elephants touch one another's glands with their trunks, Guinn says, suggesting that the secretions play a role in communication. Elephants do send out chemical signals for other purposes. In 1996, L.E.L. Rasmussen of the Oregon Graduate Institute in Portland, who works with the Hendrix team, identified a compound in a female elephant's urine that indicates she's ready to mate (SN: 3/9/96, p. 159).

The researchers plan to continue identifying the remaining components of the gland secretions and to examine other liquids—sweat from the elephants' toes, for one. By knowing the composition of these fluids and how they differ by the sex, age, and diet of the animals, the researchers hope to find ways to help them breed more successfully in captivity. —C.W.

Violin's varnish makes beautiful music

The secret behind the rich tone of 17th- and 18th-century Italian violins, including the ones made by Stradivarius, lies in the wood's finish, says Joseph Nagyvary of Texas A&M University in College Station. A biochemist and amateur violin maker, Nagyvary has analyzed wood samples from antique stringed instruments and applied what he's learned to his own creations.

The way in which the wood is treated turns out to be more important than how the violin is carved, he claims. Others have examined various aspects of violin structure (SN: 9/3/94, p. 152). "You can make a very good sound in a relatively ugly instrument." Cheap, rubbery varnishes damp high frequencies, which in good violins act "like a sheen that accompanies the sound," he explains. Although audiences may not perceive many of those frequencies, the violinist responds to them, he says.

Nagyvary has made 84 violins over the last 20 years, chemically treating several of them to mimic the Stradivarius sound. Edith Emily Hines of the Cleveland Institute of Music played an instrument made by Nagyvary and an Italian one made in 1753. Despite the modern violin's good sound quality, Hines says, she can tell the difference. —C.W.

Soap stamps out grease fires

A common household safety tip cautions cooks not to throw water on a grease fire, because water will spread the blaze rather than put it out. Special fire extinguishers for grease fires contain chemicals designed to break apart fatty acids, forming a soapy layer that smothers the flames.

To test if this soap-making mechanism actually does what's claimed, Jenny N. Davis and Philip J. Karjala of the College of St. Benedict in St. Joseph, Minn., studied the products of grease fires in their laboratory. The researchers burned small amounts of cooking oil and then extinguished the flames with two kinds of materials made by Ansul in Marinette, Wis. After chemically analyzing the foam, they found that it contained a mixture of salts resulting from reactions between the oil and the extinguishing agents, thus confirming how the flames get snuffed. —C.W.