RANDOM SAMPLES

edited by JOCELYN KAISER

Genetic Link to Ovarian Cancer

The tumor-suppressor gene *BRCA1*, discovered only last year, is already a heavyweight in the cancer arena: Inherited defects in the gene underlie half of all cases of hereditary breast cancer (*Science*, 7 October 1994, pp. 66 and 120). And researchers suspected it was a major culprit in ovarian cancer as well. Now, a study published last week confirms that it is—but not in the most common form of that cancer.

The report, in the journal *Cancer Research*, indicates that mutations in *BRCA1* are present in up to 90% of women with hereditary ovarian cancer, suggesting that the gene "might better have been dubbed *OVCA1*," says Jeff Boyd, a molecular geneticist at the University of Pennsylvania and the study's lead author. But at the same time, the study failed to find any connection between *BRCA1* and the disease's most common form: "sporadic," or noninherited, ovarian tumors.

Boyd and colleagues searched for DNA mutations in 115 women with ovarian cancer and five healthy women. They found mutations in the *BRCA1* gene in eight subjects, including two from the unaffected group. All of these occurred in women whose medical or family histories indicated a genetic vulnerability to ovarian cancer. "We were unable to find a single mutation other than germ-line [heritable] mutations," Boyd explains. "That fact, to us, demonstrates clearly that if *BRCA1* plays any role at all in sporadic ovarian cancer, it's a very minor role."

"I'm very excited about Boyd *et al.*'s findings," says Sofia Merajver, a cancer researcher at the University of Michigan. "They add to our confidence that we should be searching for other responsible genes" on *BRCA1*'s home, chromosome 17, she says. Other researchers, however, confess they're quite puzzled. "You have a gene that predisposes a family to ovarian and breast cancer, but ... doesn't seem to have much to do with [noninherited] cancers," notes Andrew Futreal, a geneticist at Duke University. "Why is the gene more important in one context than the other? It's going to be a tough nut to crack."

Results Without The Review

As Rustum Roy sees it, "peer review is dying." And he's doing everything he can to help lay it to rest. The Pennsylvania State University materials scientist, who helped launch the Materials Research Society (MRS) and the *MRS Bulletin*, is starting up a new unreviewed journal called *Innovations in Materials Research* (*IMR*). His aim: to allow senior materials researchers to publish results without the hassle and delay of the independent scientific review required by most journals. But *IMR* already has its own delays: Originally set for a July debut, the journal is now supposed to come out in September.

Too often, Roy believes, peer reviews reject innovative work or accept faulty work because the reviewers don't understand the subject well enough. "Peer review doesn't achieve what it is supposed to do, which is quality control," says Roy.

As an alternative, Roy is testing what he calls "super peer review": using a researcher's past scientific success as the benchmark for acceptance. To publish in *IMR*, academic researchers must have published about 50 peer reviewed articles or patents (fewer for industrial researchers). Younger or less prolific scientists who haven't yet earned a track record can be sponsored by a senior researcher.

But the ease of publication is more likely to attract the truly weird than the truly innovative, many researchers say. "I'm not convinced that people will take it seriously," says Stephen Mann, a chemist at the University of Bath in England. "Track record counts for something. But it's not necessarily true that a great scientist will continue to produce rigorous work."

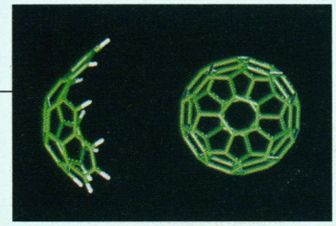
"It may not work," acknowledges Roy. "But scientists need to experiment with the way they do business."

Clinton, Science Panel Finally Meet

A year and a half after it was created, the President's Committee of Advisers on Science and Technology (PCAST) has finally met its advisee: President Bill Clinton. Squeezed between Clinton's announcement of renewed diplomatic relations with Vietnam and a meeting with the Black Caucus, PCAST members had a half hour with the president on 11 July to hear his views on science and technology.

Participants said Clinton is concerned that budget cuts made by the U.S. Congress will dismantle the country's research and development establishment and prove disastrous in the long term for the nation. But although the White House gathering took place less than a day after a House panel drastically cut space science funding (*Science*, 14 July, p. 156), the president spoke only generally about the importance of science and technology without delving into specific threats from Congress, according to panel members.

"The discussion was on a higher plateau," PCAST Chair John Young told *Science*. "His concern is that the new Congress doesn't have a clear perspective" on the need for the government to support R&D. The issue for many PCAST members is whether the president will help Congress gain a clearer view. Although one participant said the president "is going to be strongly engaged" in fighting these research funding cuts, the form of his engagement—speeches or phone calls to lawmakers, for example—has yet to be determined, White House officials say.



P. RABIDEAU/LSU

Carbon cache. Buckybowl and ball.

Fullerenes on The Half Shell

Ever since the 1985 discovery of clusters of 60 carbon atoms shaped like soccer balls, researchers have been struggling to build these "buckyballs" from scratch in hopes of producing them cheaply and finding novel ways to alter their architecture. No one has gotten there yet, but a team at Louisiana State University (LSU) has come a step closer: They've created bowl-shaped fullerene molecules equivalent to half of a C_{60} molecule, which have the potential to be paired to produce buckyballs.

LSU chemist Peter Rabideau's group synthesized the first "buckybowls" last year, but those molecules lacked the structure to assemble into spheres. The new compounds "are much more interesting," says Rabideau, because "they are exactly half of C_{60}." To make them, the researchers started with nine-carbon molecules known as 1,3-indanedione. They tacked on more carbons while duplicating the unique structure of pentagons and hexagons found in C_{60}. The result, published last month in the *Journal of the American Chemical Society*, is pairs of buckybowls which are chiral, or mirror images of one another. The group now hopes to stitch these pairs together using metal atoms to catalyze the reactions.

"It's very nice work," says Orville Chapman, an organic chemist at the University of California, Los Angeles, who has also worked on the synthesis of C_{60}. Cheap buckyballs would be a boon, say Chapman and others, because researchers hope to use the hollow molecules to do everything from carry drugs to specific tissues to speed electron transfer in plastic solar cells. The buckybowls may also lead to the

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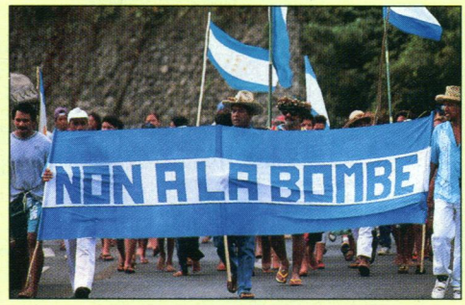
French Scientists Denounce Test Plan

The French public—unlike the rest of the world—has shown indifference toward President Jacques Chirac's plans for resumption of nuclear tests in the South Pacific. But not France's scientific community: Last week the French daily *Libération* published an appeal signed by 400 scientists opposing Chirac's plan. Signers include two Paris university presidents and several researchers of the French nuclear energy commission.

The petition states that France's arsenal can be adequately tested and maintained with computer simulations and other tools, and the real reason behind the tests is the government's desire to develop new types of nuclear weapons. What irks the signers most, says physicist Pierre Jaeglé of Paris University at Orsay, who initiated the appeal with two colleagues, is that "the reasons for resuming nuclear tests were presented to the French public as 'scientific reasons.' ... So the responsibility for these decisions is laid on science and the scientists. We maintain that it is a political decision."



PH. GIRAUD/SYGMA

Ban backers. Scientists in France have added their voices to those of these protesters in Tahiti.

The scientists acknowledge, however, that there is little hope that Chirac will reverse this decision, but hope their plea will heighten public opposition in the future. "This petition will not change much" this time, says physicist Dominique Delande from the Ecole Nationale Supérieure in Paris. "I believe, however, that it will help make this series of tests the last."

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development of other new three-dimensional carbon molecules, says Chapman. One possibility is molecules with two buckybowls back to back, which could have novel electronic or catalytic properties. "At present, there's nothing like that around," he says.

Pertussis Vaccine A Success

Encouraging results from two large-scale tests of new-generation vaccines against pertussis, or whooping cough, are raising hopes for a generation of quieter, healthier, and cough-free children.

The new vaccines contain only selected proteins from the pertussis-causing bacterium. Traditional vaccines made from the whole organism aren't as potent and often cause rashes, fevers, and other side effects. On 13 July, researchers in Europe and the United States revealed the long-awaited results of the 3-year trials, which involved more than 25,000 children in Sweden and Italy. The researchers found that three new-generation vaccines were more than 80% effective, while the old vaccine only worked 36% to 48% of the time. All are given together with diphtheria and tetanus vaccines.

What's more, the new vaccines caused significantly fewer side effects. These results promise to set "a new gold standard" for pertussis vaccines, says Anthony Fauci, head of the U.S. National Institute of Allergy and Infectious Diseases, a key sponsor of the trials.

The standard vaccine against pertussis is known as the "whole cell" preparation because it contains a killed version of the bacterium *Bortadella pertussis*, the agent that causes whooping cough in 50 million people each year, killing 350,000. The new "acellular" vaccines, in contrast, only contain select parts of the organism and its toxins, which researchers hoped would reduce side effects.

The manufacturers of the acellular vaccines—Connaught, Chiron Biocine, and SmithKline Beecham—plan to seek Food and Drug Administration approval to market them soon. "Because of the high quality of the studies, we're hoping approval will be rapid," says Larry Pickering, head of pediatric research at Children's Hospital of The King's Daughters in Norfolk, Virginia.

Japan, U.S. Differ On Science

What do people hope to get from science and technology? Although the technology itself may not differ by geography, the answers certainly do. In Japan, 2000 adults responding to a new survey by the Science and Technology Agency give highest ranking to an improved environment and more efficient energy sources. At the same time, they are dubious about the positive impact of science on their lives, with a quarter saying that science and technology have "degraded" public health.

JAPANESE EXPECTATIONS OF SCIENCE AND TECHNOLOGY

Field	% Agree
Preserving the environment	68
Developing energy resources	62
Developing natural resources	58
Waste handling/disposal	57
Disaster relief/public safety	54
Infrastructure	41
Health	39
Supporting elderly/disabled	38
Industrial production	33
Agricultural production	30
Improving lifestyle	19

Based on 2045 responses to 3000 mailed questionnaires.
SOURCE: NISTP

Similar surveys in the United States have strikingly different results. Americans are uniformly positive about the impact of science, and they cite medical technologies—for example, new surgical techniques and artificial organs—as the most important scientific advances of the past half century, according to political scientist Jon Miller of the Chicago Academy of Sciences, whose work appears in the current *Science and Engineering Indicators* of the National Science Foundation.

Survey director Eiichi Muto, of Japan's National Institute of Science and Technology Policy, sees the Japanese media behind that public's responses in this and earlier surveys. "In Japan, the mass media has a great influence," he says, "and global environmental issues have been getting a lot of attention."

Galileo Launches Jupiter Probe

A probe designed to plunge into Jupiter's atmosphere at 170,000 kilometers per hour, measuring trace elements that could hold clues to the formation of the solar system, successfully sprang loose from the $1.3 billion Galileo spacecraft last week.

Scientists at the National Aeronautics and Space Administration (NASA) were elated, for Galileo has been rocked by a series of delays and equipment failures since the project began in 1977. "It's wonderful to have some good news," says Jay Bergstralh, program scientist for Galileo. An auditorium jammed with the families and friends of Galileo team members "was in an uproar" when the signal came confirming the release, says William O'Neil, Galileo project manager.

The probe was released while Galileo was 82 million kilometers from the giant planet. It will take nearly 6 months to reach Jupiter, and is expected to hit the planet's atmosphere on 7 December. The probe will then slow and drift down on a parachute, sending data for up to 75 minutes.

During this time, its seven instruments will provide scientists with the first direct data on the atmosphere of an outer planet. "What we do know about the composition of these atmospheres comes almost entirely from [Earth-based] remote sensing," says Bergstralh. Directly detecting atmospheric trace elements could yield clues as to the composition of the nascent solar system, says O'Neil, as Jupiter's immense gravity probably still holds some of those original constituents.

After providing scientists with this rare glimpse into the past, the probe will either be crushed by atmospheric pressure or succumb to some other malfunction.