Biologists Visit New Orleans (Under an Assumed Name)

Recovering from Mardi Gras and taking a breather before hosting college basketball's Final Four, New Orleans was relatively sedate last week when more than 8000 biologists attended an old meeting that has recently received a new name: Experimental Biology '93, which was formerly known as FASEB. After explaining the circumstances that lie behind the name change, we describe two of the meeting's more intriguing sessions.

What's in a Name?

Depending on whom you ask, the FASEB meeting's metamorphosis into Experimental Biology '93 is long overdue or a risky gamble. For some, FASEB, the annual spring gathering of the federation's six biology-based societies, was suffering from hyperplasia. "It was a monstrous meeting. When you have 15,000 people together and multiple concurrent topics, it's tough to choose sessions," says Charles Haddock, executive officer of the American Society of Biochemists and Molecular Biologists.

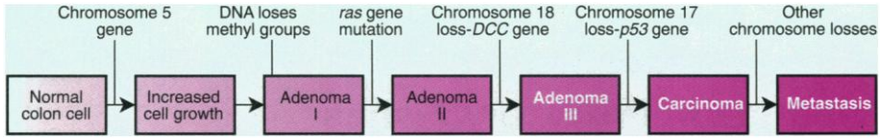
So, in a move that they hoped would shrink the proliferative growth and encourage new societies to join FASEB—societies reluctant to be forced into an already bloated meeting—FASEB's top officials decided they would no longer require members to participate. In one sense, the move paid off handsomely. New groups, like the American Society of Cell Biologists and the American Association of Anatomists, joined FASEB; more are expected. And attendance dropped considerably at this year's meeting, since the societies for immunologists, molecular biologists, and biochemists decided to hold separate get-togethers.

But many criticized the meeting's new theme-based program for its confusing organization and numerous scientists and exhibitors actually misssed the huge crowds. One symposium chair, who told *Science* he should have picked a smaller room for his session, complained: "The registration is really low. I'm sure there's some soul searching going on at FASEB headquarters." Not so, responds FASEB president Shu Chien of the University of California, San Diego. "It's impossible to have a true FASEB meeting anymore. We just can't ask everyone to meet together."

Colon Cancer Gene

The recent unraveling of colon cancer genes has become one of the most heartening serials in cancer literature—and now comes another chapter. In New Orleans, Kathleen Cho from Bert Vogelstein's lab at John Hopkins University School of Medicine presented new evidence that a gene known as *DCC* is a tumor suppressor gene, confirming a widely held suspicion among those studying this type of cancer. Researchers now appear correct in their belief that the disruption of the *DCC* gene is one of the steps in the series of genetic changes that lead to colon cancer.

The clues pointing to *DCC*'s involvement were numerous. In 75% of colon cancer cases, for instance, the area on chromosome 18 where the gene normally resides is missing (hence the gene's name: deleted in colon carcinoma or *DCC*). This wasn't conclusive, however, since cancerous cells often exhibit gross chromosomal deviations that are merely a result of the disease, not a cause. Cho, Lora Hedrick, a colleague at Hopkins, and oncologist Catherine Reznikoff of the University of Wisconsin, Madison, realized that the ultimate test of a candidate tumor suppressor gene would be to introduce it into a tumor cell line and then see whether those cells produce cancer in rodents less efficiently than they would without the *DCC* gene.



Link in the chain. *DCC*, a tumor suppressor gene with a role in colon cancer, was identified by means of deletions on chromosome 18.

But they couldn't use just any cancer cell line. The problem was, as Cho explained to her audience of oncologists and pathologists at the meeting, that most known tumor lines for colon cancer already suffer from a slew of mutations in other genes like *p53*, *ras*, and *APC*. Consequently, it may be too late to put the brakes on colon cancer just by inserting the *DCC* gene. Cho and her colleagues turned to a simpler model: bladder cancer cell lines. "This looked like a much better system in which to replace *DCC*," said Cho, because the cancer was apparently caused by a deletion on chromosome 18, including the area where the *DCC* gene was—not by a host of other cancer genes. The group's hunch proved correct. "Not only was there a reduction in tumor take, but in the volume of tumor growth," reported Cho.

The next step for researchers is to discern *DCC*'s normal function, a task for which clues already exist. Hedrick has data suggesting the *DCC* gene product is important to cell differentiation. Equally provocative, said Cho, is the finding that the *DCC* protein bears a strong structural similarity to certain fibronectin-like cell adhesion molecules. A tumor suppressor gene involved in cell adhesion would be a first, she explained, though not completely unexpected since the loss of normal adhesion properties may be crucial to how cancer cells spread through the body when they metastasize.

Thanks for the Memories

In many animals the passing years take a toll on the ability to remember, even to think clearly. These problems, of course, are most worrisome in humans, where some researchers see Alzheimer's and other neurodegenerative diseases as nothing more than a speeded-up version of age-related decay of brain function. While this view is controversial, researchers have long sought ways to combat the aging process seen in animal models. And though they have had little success, one talk in New Orleans demonstrated why the search is still continuing. Thaddeus Marczynski, a pharmacologist at the University of Illinois College of Medicine in Chicago reported that rats given a chemical called flumazenil were protected from age-related memory difficulties.

Marczynski and his co-workers took "middle-aged" rats, approximately a year old, and over a period of 10 months daily administered flumazenil to the rodents in their drinking water. They waited 2 more months after the administration period to demonstrate that any observed effects were from the drug's protection against aging and not from a stimulatory effect of the drug itself. Then they ran the rats through food-baited maze tests and compared them with control animals.

Though ordinarily rats' capacity to learn such mazes drops off sharply with age, apparently that isn't the case for flumazenil-treated animals. Compared to their age-matched controls, Marczynski reports, they "learned very quickly and were much more efficient." In fact, he says, "the flumazenil rats were comparable to the youngsters. During those 10 months, we were protecting the rats from the neurodegenerative processes that occur normally," he contends.

Though few other researchers have explored flumazenil's potential, there is reason

to study the compound's effects. Flumazenil is an antagonist of benzodiazepine (BZD) drugs, a group of tranquilizing agents of which the best known is valium. According to Marczynski, BZD agents, along with the signal transmitter gamma-amino butyric acid (GABA), form an inhibitory system that contributes to neuronal death over time by depriving nerve cells of needed nutrients. Flumazenil may protect neurons by preventing the body's naturally occurring BZD compounds from attaching to their receptors and exerting their damaging influence, he says.

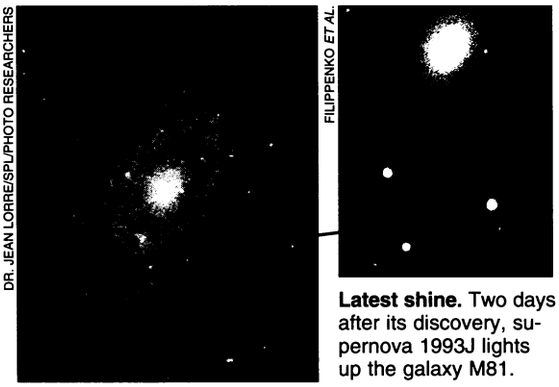
Though Marczynski's results are provocative, that's nothing new in a field that has seen many leads fail to pan out. Says Zaven Khachaturian, associate director for neuroscience and neuropsychology of aging at the National Institute on Aging, mindful of past pitfalls: "This is a very interesting single animal study, but one needs to be careful. I wouldn't jump to suggesting it's a therapy for Alzheimer's or age-related memory problems."

–John Travis

ASTRONOMY

A New Supernova In the Northern Sky

Even in this age of space telescopes and giant mountaintop observatories, astronomy can still reward amateurs. Francisco Garcia, a star-gazer in Lugo, Spain, proved it once more when, on the night of 28 March, he noticed an eruption of brightness from one arm of a nearby spiral galaxy called M81. At once, he alerted a fellow member of the Madrid Astronomical Association, Diego Rodriguez, who photographed the anomalous bright spot. The news spread within hours, and the following night, astronomers led by Alexei Filippenko of the University of California, Berkeley, confirmed what Garcia himself suspected: He had discovered a new supernova. Only a day or two old when it was spotted, supernova 1993J, as it has been named, is the brightest to shine in the Northern Hemisphere since 1937.



DR. JEAN LORRE/SPL/PHOTO RESEARCHERS

FILIPPENKO *ET AL.*

Latest shine. Two days after its discovery, supernova 1993J lights up the galaxy M81.

The discovery, says George Sonneborn of NASA's Goddard Space Flight Center, has set the astronomical community "all on fire." True, the supernova that exploded in 1987 in the Large Magellanic Cloud, a satellite galaxy of the Milky Way, was far brighter, bright enough to be seen with the naked eye; this new blast, at its peak on 31 March, was still 40 times too faint to be visible. But SN 1987A could be seen only from the Southern Hemisphere, Sonneborn points out. "A lot of Northern Hemisphere observers who felt left out by 1987A have now got their chance."

Already, supernova researchers have evidence that they're looking at a member of the same supernova class as 1987A. Supernovas can result from the explosion of a white dwarf—an ancient, burned-out star—or the collapse of a supergiant star. The second type—called type II—is the more violent kind, and it has a trademark: Spectra of the light from the explosion reveal hydrogen left over from the giant star's atmosphere. White dwarfs, in contrast, having burned up all their hydrogen, show no such emission lines. SN1987A belonged to type II, and so, it seems, does the new event.

Filippenko, who is coordinating ground-based observations of the supernova, says he and his colleagues have already seen the telltale hydrogen lines—though because the hydrogen lines are quite weak, he is quick to add, "I wouldn't bet my life" that it's a type II. Still, there's another reason to think it is, Filippenko says: Other astronomers think they may have identified the progenitor star in earlier images, and it's a supergiant.

But the suspect is a red supergiant, a larger and cooler star than the blue supergiant that exploded in 1987A. And, if so, the explosion should play out differently over the coming weeks and months. Indeed, it already shows signs of doing so. Within 2 days of the discovery, the International Ultraviolet Explorer (IUE) satellite was watching the brilliant ultraviolet emissions of the early stages of the explosion fade, giving way to visible light, as the expanding gases cooled. Sonneborn, an IUE investigator, says SN 1993J is cooling more slowly than 1987A did—just what you'd expect for a red progenitor, says Robert Kirshner of the Harvard-Smithsonian Center for Astrophysics.

Meanwhile, a gallery of astronomical instruments is lining up to observe other aspects of the supernova. Starting early this week, the Very Large Array, a giant radio telescope in New Mexico, was scheduled to observe its radio emissions. And at press time the Hubble Space Telescope was turning toward the fading supernova. In one project, starting next week, a group led by Kirshner hopes to measure the angular size of the explosion—a first step to determining its distance. If they succeed, astronomers trying to learn the size and age of the universe will have another rung in their distance scale, and this newest supernova will have brought astronomers a step closer to answering some of their oldest questions.

–Ray Jayawardhana

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ASTRONOMY

Tribe of Brown Dwarfs Discovered?

The search for brown dwarfs—objects too large to be planets but not quite massive enough to catch fire as stars—has so far turned up more embarrassing false leads than convincing results. In 1984, for instance, astronomers at the University of Arizona announced the discovery of an object the size of several dozen Jupiters emitting a faint infrared glow, only to have it dismissed as an observational artifact. The handful of suspects fingered since haven't fared much better. At the Royal Astronomical Society's national meeting in Leicester last week, however, astronomer Richard Jameson of the University of Leicester claimed that his team has captured not one, but an entire tribe of brown dwarfs—nearly two dozen—in the Pleiades (the Seven Sisters), a cluster of young stars and gas.

If the claim holds up, it will fulfill a long-standing prediction in astrophysics. Theorists hold that not every cloud of star-forming matter should be big enough to spawn a full-fledged star when it collapses. If the resulting object is less than 8% as massive as the sun, it won't be able to sustain the heat and pressures needed to burn hydrogen and will gradually cool, emitting infrared radiation as it

KIM GORDON/SPL/PHOTO RESEARCHERS

Seven sisters....and a retinue of dwarfs?