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Bernofsky

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medicine as examples.

Later, LaRosa explained how the new corporation offers a way for academic medical centers to continue great strides in biomedical research like those made since World War II.

"The centers of excellence will give New Orleans and, of course, Tulane and Columbia, the opportunity to get into new fields and to develop expertise that will be on the cutting edge. We have to be in a position as a teaching hospital to develop these new techniques. We will be able to do that," he said.

The medical center will not only continue its tradition of education, research and patient care but also gain access to \$75 million to support 11 centers of excellence in areas such as gene therapy, molecular diseases, infectious diseases and primary care studies [see p. 2]. This support for research and teaching augments a commitment to continue transfer of more than \$22 million annually to the School of Medicine for

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sory Council chair Cyndi Trygg  
ct and recognition for staffers.

tell us we're doing a good job. We need to be treated with respect."

She advises other staff members to keep apprised of the work of the council and to get involved.

The council has a real impact on staff matters, she says. For example, in recent years, council members have increased staff votes in the University Senate from zero to three, and staff have seats on a number of Senate committees. Staff representatives may also

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## Radical Research

It reads like a good mystery novel. The villain changes his identity and strikes quickly and viciously, causing irrevocable damage. He then disappears, leaving little evidence to find this dastardly culprit or to prevent his striking again.

Carl Bernofsky, research professor of biochemistry, is Sherlock Holmes in this mysterious tale. The environmental pollutant—1,1,2-trichloroethylene—is the elusive villain. A solvent used widely in the military and by industry to clean metal parts, trichloroethylene is a frequent environmental contaminant of ground and surface water and is among the 10 most cited chemicals at hazardous waste sites, according to government reports and scientific studies.

"There is a lot of this environmental pollutant around," Bernofsky says. "From waste sites, it percolates into the ground and into ground water. No one knows just how toxic it is to humans, but, in animals, it has been shown to be cancerous."

Bernofsky says studies have demonstrated that trichloroethylene causes lung, liver and testicular tumors in rodents, but little is known about the mechanism by which the compound can cause cancer. With a two-year, \$250,932 grant from the Air Force Office of Scientific Research, he hopes to show how and why trichloroethylene is toxic in experimental animals.

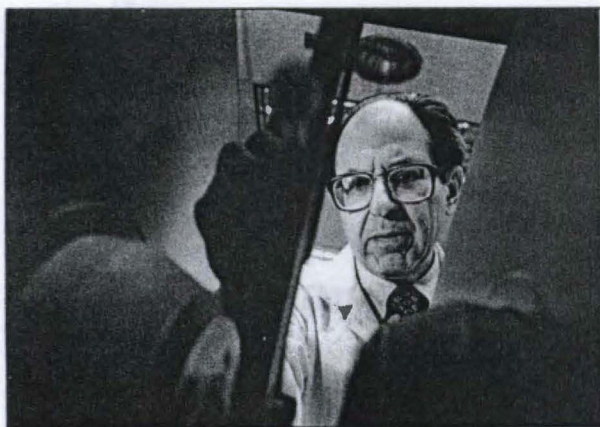
His hypothesis is that free radicals are involved.

"Free radicals are compounds with a free electron on them that makes them very unstable and highly reactive," Bernofsky says. "You can't really get a handle on them. They're not like stable compounds that you can isolate and study. Trying to trap them is like trying to catch a bullet that's flying through the air. You know that the bullet has been there because you can see the target that it hits has been damaged. Free radicals act in the same way."

Bernofsky thinks that dangerous free radicals are formed as the liver breaks down the trichloroethylene into a variety of metabolites, including dichloroacetic acid and trichloroacetic acid.

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Carl Bernofsky, research professor of biochemistry, uses this machine—an electron paramagnetic resonance (EPR) spectrometer—to look for elusive free-radical compounds.

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"What our research is going to try and do is to show that these compounds are converted in the liver to free radicals," he says. "This free radical can combine with DNA to form an adduct. When it latches on to DNA, it can be mutagenic or carcinogenic. If it latches on to a protein or lipid, that can be merely toxic to the cell."

The first step in Bernofsky's research will be to find whether the acids formed in the liver are converted into a free radical. To do this, he will incubate liver cells with trichloroacetic acid and see whether radicals form, which is no easy task.

"The radicals form so quickly and disappear so quickly that you never see them," he says.

Bernofsky will use a machine called an electron paramagnetic resonance (EPR) spectrometer and a technique called "spin trapping" to look for free radicals. In 1992, Bernofsky received a Louisiana State Board of Regents grant to purchase a \$250,000 EPR machine, which "does only one thing. It detects the presence of a free electron. But there is no other way to detect the presence of a free electron other than by using this piece of equipment," he says.

If he finds these radicals, he will use a radioactive label to study whether they connect to proteins, lipids and nucleic acids to form an adduct. If a nucleic-acid adduct forms, he will attempt to isolate enough of the material to analyze its molecular structure using mass spectroscopy. Because nucleic acids are the building blocks of DNA, studying the structure of this adduct could help researchers understand the carcinogenic nature of the original trichloroethylene compound.

Bernofsky says this study is his first foray into research that applies the concept of free radicals to an environmental concern. Other Tulane research involving free radicals includes studies on nitric oxide; cardiac, brain and kidney disease; and inflammatory diseases. Free radicals can

also form when blood and oxygen are cut off from an organ and later readmitted, Bernofsky says, and are a concern during transplant operations.

The fleeting and ephemeral nature of free radicals makes researching them a bit esoteric, Bernofsky says.

"This is not very mainstream work," he says.

—Judith Zwolak

#### Trygg from p. 1

now sit in on meetings of the board of administrators.

Perseverance is the key to accomplishing staff goals, Trygg adds.

"If we stop talking about an issue, it will never happen," she says. "If we keep talking, administration will either tell us to go away or they'll do something about it."

A little levity also helps.

"If you have sense of humor, you can deal with things more easily," she says.

On weekdays, Trygg travels from her country home in Madisonville to the pine-bordered primate center and performs laboratory experiments for studies in the microbiology department, where she has worked for 22 years. Her current work involves helping research scientist Robert Gormus find a vaccine for leprosy.

"I love my job. My coworkers and my boss are great people," she says. "The primate center is a beautiful place to come to work. It's so laid back."

Before her term as council chair ends this year, Trygg says she would like the council to encourage the administration to adopt a supervisory training program and address other staff concerns such as dental plans, parking issues and vacation time during the winter holidays. All things considered, she says she has appreciated the unique view her position affords her.

"On the council, I get to see other parts of the university," Trygg says. "It's a university with a future. It feels good to work with such a diverse student body."

—Judith Zwolak