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January 31, 2003

# Stories of modern science ... from UPI

By Ellen Beck  
United Press International

## RESEARCH TARGETS FREE RADICAL FIGHTER

### Top Stories

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- 'They had a high and noble purpose'

British researchers say they've been able to see the structure of a key energy-releasing enzyme that minimizes free radical production in animals. The Imperial College of London team visualized the entire molecular structure of succinate dehydrogenase in the bacterium E. coli and saw how the protein's 3-D shape helps prevent the formation the destructive oxygen atoms, which are a by-product of cellular respiration and can damage cell function. Professor Paul Fremont said the complex metabolic enzyme "protects the bacterium from self-inflicted damage and lies at the heart of the cell's energy powerhouse. It acts like a built in anti-pollution system, and has significant implications for understanding human aging." The next step is to engineer succinate dehydrogenase to maximize its efficiency.

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## SMALL WORLD NETWORK PRODUCES BIG RESULTS

If you research complex issues, such as the spread of disease or the rise and fall of financial markets, a large network of computers easily can break down the information. The communication snafus come when the computers have to compare notes, says Gyorgy Korniss, assistant professor of physics at Rensselaer Polytechnic Institute. Korniss says the solution is to use "small-world" networking -- which links a computer to its nearest neighbor, and also a few other random computers in the group. Each computer in a network usually is connected to its closest neighbor but doesn't get a picture of the whole neighborhood. Korniss says in a small world-like

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Updated at 9:00 p.m.

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- [Rising temperatures preceded shuttle's end](#)
- [Admistr grief, cargo ship flies to station](#)
- [Keeping shuttles young tops NASA's list](#)
- [Shuttle investigation board named](#)
- [Clues to Columbia disaster sought in Texas](#)
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communication network individual computers randomly "check in" with each other to make sure they are in sync. "Our results indicate that only a few random links are necessary for each computer to know how the network as a whole is behaving." Korniss adds.

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#### EXPENDABLE MICROPHONES COULD HELP IN SEARCH

Expendable microphones could help in the search for survivors following a collapsed building. Penn State researchers tested the theory at the World Trade Center following Sept. 11, 2001. Thomas Gabrielson and students say dropping microphones into the rubble of a collapsed building could amplify the sounds of survivors calling out for help despite ground level noise. Usually survivor searches require noise generating activities at the surface be stopped. The Penn State team found the noise level in the interior voids of the rubble was about the same as that of a quiet residential neighborhood, even though the noise level at the surface was much higher due to rescue operations. "Our results suggest that if expendable microphones were dropped or thrown into the voids in a building collapse, the sounds from trapped survivors would be louder and the surrounding noise quieter so that acoustic search could be continued without interfering with other operations," Gabrielson says.

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#### OZONE TO PROTECT GRAIN

A new study finds ozone can eliminate insects in grain storage facilities without harming food quality or the environment. Purdue University researchers the gas is an alternative to fumigants -- coming at a time when an international treaty bans the use of ozone-layer harming chemicals currently used to rid food storage facilities of insects. When ozone is used for killing grain insects, it lasts for a short period of time and does not damage the environment or the grain, Purdue scientists report. "Ozone has a very short half-life and we're using relatively low dosages, but enough to kill an insect," said Linda Mason, Purdue entomology associate professor. "The chemicals currently used can kill everything in and around the grain bin, including people. With ozone, we're not generating ozone at deadly concentrations, and we have better control over it when it's present."

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Prayer meetings held for Kalpana Chawla

**IN DAMN SENATORS, MARK JUDGE HAS WRITTEN A BOOK THAT IS AT ONCE A TOUCHING MEMOIR OF HIS GRANDFATHER, STAR FIRST BASEMAN FOR THE OLD WASHINGTON SENATORS; A HISTORY OF BASEBALL IN ITS GOLDEN AGE; AND AN EXCITING ACCOUNT OF THE WASHINGTON SENATORS' 1924 WORLD SERIES VICTORY.**

