Oldest SCID survivor dies

Baylor College of Medicine

David in 1979

"David," the 12-year-old boy who spent all but the last 15 days of his life in sterile plastic chambers, died of heart failure last week at Texas Children's Hospital in Houston. Full autopsy results will not be known for several weeks, according to a spokeswoman for the Baylor University physicians who had treated the child all his life. The immediate cause of heart failure was probably the fluid that accumulated around his heart and lungs in the few days preceding death, she said. But it is still not known what role abnormal nodules of immune cells found throughout his intestine, lungs and spleen played in his death. Tests should show within several weeks whether the cell growths were malignant.

Enclosed in a plastic bubble chamber within hours of his birth, David lived to be the oldest survivor of severe combined immunodeficiency (SCID), a rare, genetically transmitted immune disorder whose victims can die from a common cold. Twelve years ago, the only alternative to virtually certain death within months for a child with SCID was isolation in a germ-free environment or, preferably, a bone marrow transplant from a healthy sibling with exactly the same tissue type. David's older sister's tissue type is similar in some respects, but not identical to David's, and the success of such "mismatched" transplants 12 years ago was nil.

Times have changed. In the last five years several U.S. research teams have developed ways to pretreat marrow that is to be transplanted so that they can increase the chances for successful engraftment (SN: 10/16/82, p. 244).

Marrow transplants from mismatched donors still succeed only a fraction of the time, says Neena Kapoor, a member of a transplant team at the Oklahoma Medical Research Foundation in Oklahoma City. David's eventual transplant last October with pretreated marrow from his sister apparently never engrafted.

"Host resistance and variability play a big role," Kapoor says. Still, the growing success rates of such transplants are providing new hope, not only to children with SCIDS, but to patients with other types of severe blood disorders, she says. In the United States alone, 58 centers routinely perform bone marrow transplants, chiefly with matched donors and primarily in patients with various leukemias and aplastic anemias. "We can't say this will be successful in every case," says Kapoor. "But it offers a chance for children with no other alternative. Techniques are still developing and improving all the time."

—D. Franklin

Preventing bitter batter: Trials of BHA

Concern raised two years ago that the common food preservative "BHA," might pose a cancer threat to humans has been reduced somewhat by recent short-term studies of the effects of the chemical in animals, a Food and Drug Administration (FDA) official said last week.

Herbert Blumenthal, director of the FDA's division of toxicology, told researchers from industry, government and universities at the Toxicology Forum in Washington, D.C., that he found the most recent data on BHA "very comforting." If the results are borne out in long-term studies, they should permit the continued use of BHA (butylated hydroxyanisole) as a food preservative, he said.

In their efforts to keep animal fat from going rancid and spoiling processed foods, industry scientists have come to rely on a class of chemicals known as "phenolic antioxidants," which includes BHA. By slowing down the reaction between oxygen in the air and fats in packaged breads, pastries and other foodstuffs, manufacturers can increase the shelf life of some products by an estimated 60 to 70 percent. "It's an extremely valuable antioxidant," Pillsbury's Howard E. Bauman told SCIENCE NEWS.

In its 40 year history of use, BHA has produced no known negative health effects in humans, but toxicologists and regulatory officials around the world called for additional research of the chemical in the spring of 1982, when Japanese researcher N. Ito reported that relatively high levels fed to rats (2 percent of their diet) produced stomach tumors in all the animals studied. Japanese officials considered banning BHA from food and beverages, but their FDA counterparts urged restraint pending a careful review of the chemical by an international panel of scientists.

After two years of research, the mid-term report card of the chemical looks good for humans despite confirmation of Ito's original findings in rats, mice and hamsters. Studies in several other species seem to indicate that the chemical causes tumors only in "forestomach" tissue, a non-glandular storage compartment unique to some rodent species. Pigs, dogs and guinea pigs tested have not been affected by the chemical.

Some toxicologists at the conference cited the absence of a forestomach in humans as reason enough to discount the relevance of Ito's research to human cancer. But David B. Clayson, chief of toxicology research for Canada's Bureau of Chemical Safety in Ottawa, called such assumptions "rather naive," because many chemicals that lead to cancer of the rat forestomach also give rise to tumors in other tissues. More important, Clayson said, are results of experiments that test the effects of different dosage levels of BHA.

Several follow-up studies have detected abnormal tissue growth in animals fed diets containing as little as .125 percent BHA (much higher than typical human consumption), but preliminary results indicate that these lesions may be reversible once BHA is removed from the diet. If BHA is a true carcinogen, capable of initiating tumors rather than simply acting as a local irritant, one would expect its effects to continue long after it is removed from the diet.

Ito's study was the first to show that BHA causes cancer in some species, but many studies have indicated that BHA and its chemical cousin, BHT (butylated hydroxytoluene), actually *inhibit* the effects of several carcinogens. Lee Wattenberg, of the University of Minnesota in Minneapolis, described his findings of the inhibitory effects of BHA in animal tumors, but he stopped short of suggesting that dietary BHA might protect against cancer in humans.

"I don't think we can answer that question," Wattenberg said. "There is a possibility, but I think it's still something that needs to be investigated." He noted that the BHA doses he used were lower than the 2-percent-of-total diet found to cause tumors in rat forestomachs, but still much higher than the levels humans typically consume.

The wide range of apparent biological effects of BHA—some seemingly beneficial and others harmful — depends on the dose, species and even the type of tissue studied, Clayson said. "I shudder to think," he added, "what would happen if one group of regulators banned the use of this compound, while another group recommended that it be given prophylactically."

Current data indicate that BHA is not a cancer hazard to humans, he said, but scientists around the world are continuing to investigate whether or not BHA interacts with DNA in cells, ever causes tumors in species without forestomachs, or creates lesions that progress after BHA is removed from the diet.

— D. Franklin