

research scientist—far longer than it takes to become just one or the other. The time spent in research training after medical school makes it harder for physicians to pay off their student loans (typically more than \$100,000). Research on humans is more complicated and takes longer than research on animals and lab cultures, and is less likely to yield positive, publishable results. And managed care—by forcing physician-scientists to treat more patients and by cutting funding to teaching hospitals for patients in clinical trials—prompts many physician-scientists to drop their lab work.

But the payoff from the combination of treatment and clinical research, in ideas generated and tested, and ultimately in benefits to patients, can be great, say the authors. In his own work with colleagues, Steinman has shown that a type of immune cell called

a dendritic cell not only directs the immune system to attack enemies, but can switch off immune cells poised to attack the body's own tissues—a discovery made only when a study was done of humans who had a deadly form of blood cancer. Thanks to pressure from pediatric oncologists, some 60 percent of children with cancer now are enrolled in clinical trials combining research and care, compared with only one percent of adults with cancer—and today at least 75 percent of the young victims are cured, compared with only five percent four decades ago.

Some steps have been taken to create more physician-scientists, without success so far. “As with the big research initiatives against AIDS and breast cancer, the public will have to demand that this research be done,” write Steinman and Szalavitz. “From the patient's perspective, nothing is more urgent.”

Free the Mice!

“Can We Trust Research Done with Lab Mice?” by Barry Yeoman, in *Discover Magazine* (July 2003), Buena Vista Magazines, 114 Fifth Avenue, 15th Fl., New York, N.Y. 10011.

Rodents—those ancient instigators of shrieks, disgust, and bubonic plague—have always found acceptance in at least one human setting: the laboratory. Mice have long been the primary subjects of medical, drug, and learning studies, but some young scientists are challenging the scientific validity of lab experiments done with mice.

Led by the Swiss animal behaviorist Hanno Würbel, reports journalist Yeoman, these scientists aim to prove that the bare-bones environment of most lab mice—shoebox-sized cages with no amenities beyond food and water—have serious biological effects on the animals that may compromise findings that are applied to human conditions.

To gauge the consequences of this environment, Würbel set up 24-hour video cameras monitoring the behavior of lab mice. The after-hours conduct he found was comparable to that of a schizophrenic or autistic human: highly regimented, repetitive activities for no practical purpose. Mice did backflips for 30 minutes at a time, gnawed at cage bars ceaselessly, and ran in continual circles. Scientists call such movements “stereotypies.”



“Tough day at the labyrinth!”

Würbel thinks that actual changes in the physiology of the animals are manifested in these behaviors.

Stolen looks at the mice's secret nightlife aren't the only indicator that impoverished lab conditions may have a profound effect. One study found that lead-contaminated drinking water damages the brains of mice in barren environments, but not those in enriched ones. Another found that small amounts of light in the lab at night significantly accelerate tumor growth.

Genetic research is also affected. In 1999, a Princeton University team removed a gene associated with the N-methyl-D-aspartate receptor in the hippocampus, a component of the brain that is a critical tool in transforming short-term memories into long-term ones. But when they placed some of these memory-deficient mice in cages enriched "with running wheels, playhouses, and an ever-changing assortment of toys" for two months, the animals were magically able to

remember again. As early as the 1950s, Mark Rosenzweig of the University of California, Berkeley showed that lab rats supplied with mazes, ladders, and sponges had increased enzyme levels, synaptic bridges, and cerebral weight.

Würbel stresses that he's more interested in the good of science than rodent liberation. He says that science would be the better for developing a more complete concept of the animals used in testing, including their evolutionary background and natural function. "I have a vision that there will be a time when we will have natural-like, although heavily managed, populations of rats or mice, maybe in big enclosures, representing whole populations."

Others reel at this suggestion. John Crabbe, a behavioral neuroscientist from Oregon, suggests that providing mice food, water, and clean bedding is plenty. Given that generations of mice have been raised in barren cages, perhaps that should now be considered their natural environment.

ARTS & LETTERS

Hip-Hop Bards

"Disappearing Ink: Poetry at the End of Print Culture" by Dana Gioia, in *The Hudson Review* (Spring 2003) 684 Park Ave., New York, N.Y. 10021.

Stepping out of the cloisters of English departments and literary journals for the first time in more than half a century, poetry is everywhere, according to Gioia, a poet and the chairman of the National Endowment for the Arts. And whom do we have to thank for this renaissance: a recipient of the Yale Younger Poets prize? An august literary critic? Guess again. A DJ named Cool Herc? Well, maybe.

Whether or not Cool Herc was the originator of hip-hop is a murky topic. It's clear, however, that the Bronx's gift to the world popularized rhyme and meter, making syllabic counts and verbal acrobatics a force in popular culture. Moreover, hip-hop, along with its close cousin, the poetry slam, and its rural neighbor, cowboy poetry, has created an appetite for oral poetry reminiscent of that in antiquity.

By the 1970s, the decade that witnessed

the birth of hip-hop, many dues-paying members of the literati saw rhyme and narrative verse as old hat, while free verse and "concrete poetry," in which the form of the words on the printed page is all-important, were à la mode. Rooted in the traditions of print culture, literary poetry still relied on variations of a 15th-century technology, movable type, for its preservation and dissemination. By contrast, the new popular poetry uses modern-day media such as radio, CDs, video, and the Internet, along with stratagems borrowed from the entertainment industry, to attract a general audience that is less and less inclined to devote time to reading.

Cowboy poetry, which originated in the oral verses of frontier folk, was revived after a 1985 convocation of poets by the folklorist Hal Cannon in Elko, Nevada. Born around the same time, poetry slams—whose cre-