ALTERNATIVE MEDICINE
▶ MEDICAL SCHOOLS

Bastions of Tradition Adapt To Alternative Medicine

Fueled by popular interest, alternative medicine is gaining ground at scores of universities; now deans want to add it to the curriculum

Catherine Chu, a first-year student at Harvard Medical School in Boston, says she chose Harvard because she believed that it had a "progressive" outlook on alternative medicine. She became intrigued with the field after getting to know a naturopath and a massage therapist in her undergraduate years in Seattle. Chu was eager to meet the Harvard faculty she'd heard about—Herbert Benson, who coined the term "relaxation response" based on his studies of Tibetan monks, and David Eisenberg, founder of Harvard's Center for Complementary and Alternative Medicine Research.

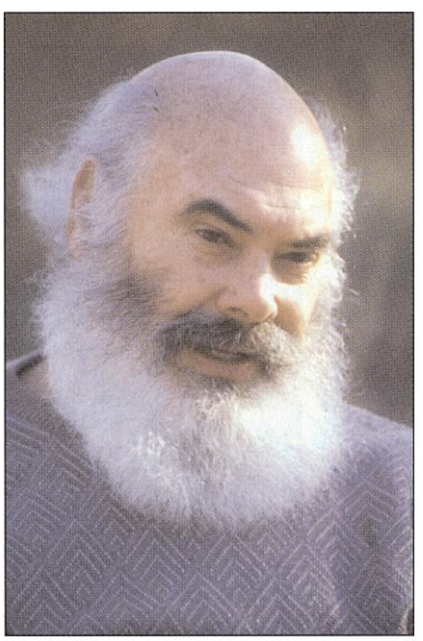
After Chu arrived on campus, however, she was "disappointed" to find that alternative medicine was "peripheral" to the curriculum. Like most medical schools, Harvard does not ask students to take courses in nontraditional medicine, which have yet to make it into the core curriculum. And alternative medicine studies are scattered among several different centers. But that somewhat haphazard approach may soon change.

A medical school panel voted in May to establish a new Division of Complementary and Alternative Medicine that will embrace Eisenberg's center and the Division of Nutrition, according to Dean of Education Daniel Federman. The aim is to bring more of the school's talent to bear on research in and evaluation of alternative medicine, Federman says, and to enable Harvard physicians to be well informed about offbeat therapies they may encounter. Presumably, Harvard would also like to capture some of the government's ballooning funds for alternative medicine (see p. 1568). Eisenberg will be the division's first chief, starting 1 July.

As Harvard goes, so goes the nation. Medical schools across the country are gingerly bringing alternative medicine into their hallowed halls—much to the consternation of some faculty members. More than 70 U.S. universities, including Columbia, Duke, Stanford, Georgetown, and several branches of the University of California, now offer some sort of alternative medicine program. Even the Association of American Medical Colleges in Washington, D.C., has jumped on the bandwagon. It invited integrative medicine guru Andrew Weil of the University of Arizona, Tucson, to address its elite council of deans earlier this year. And in November, a select academic meeting sponsored by the Josiah Macy Jr. Foundation will consider how best to add alternative medicine to traditional medical curricula.

Alternative medicine advocates are keen to see such initiatives grow, and medical school administrators are hopeful they will attract more grants and patients. But in some institutions, traditional faculty members have raised vocal objections to what they see as an erosion of standards in pursuit of easy cash.

One of the most unyielding critics of trendy alternative clinics is Wallace Sampson, a professor at Stanford's Medical School and editor of *The Scientific Review of Alternative Medicine*. Sampson says that nearly all the alternative medicine courses and centers he examined in a recent survey were "developed and driven by advocates." The movement is "really a secular religion," Sampson asserts, and poses a threat to scientific medicine that's "more serious than anyone realizes." Sampson believes that academicians have not raised a clamor because, if you want to advance in medicine, "you don't make waves." Arnold Relman, former editor of *The New England Journal of Medicine*, agrees: "It is becoming politically incorrect for the movement's critics to express their skepticism too strongly in public."



Alternative guru. Both patients and deans of medical schools seek out Andrew Weil's advice.

CREDITS: P. K. WEIS/AP

Even so, there have been a few scuffles. For example, some faculty members at the medical school of the State University of New York, Stony Brook, complained to the president when administrators established an alternative medicine center in 1997—and gave the director, Samuel Benjamin, a salary and benefits of $320,000 at a time when other departments were facing cutbacks. Some also objected to the decision to let Benjamin retain an interest in a company that sells herbal medicines and broadcast advice weekly on a radio show. One pharmacology professor said the package was a desperate attempt to recruit patients and "take money from an unsuspecting public." But Benjamin survived the criticism.

Weil, perhaps the best-known champion of alternative medicine, has flourished in the heart of a major medical school, creating one of the rare centers where unorthodox methods are being taught to resident trainees. In addition, Weil teaches a mandatory course for medical students.

After finishing his medical training at Harvard in the 1960s, Weil resorted to psychedelic drugs in a search to understand the mind-body relationship. Weil eventually returned to the clinic, adopting a hybrid style that combines standard and alternative medical practices. In 1996 he established the Center for Integrative Medicine at the University of Arizona. Relman has described Weil as articulate, intellectually nimble, and "wonderfully ambiguous." But Relman dismissed some of Weil's views on health as "largely nonsense"; others, he wrote in a critical essay, "could result in dangerous delays in the diagnosis and the treatment of serious illness."

These slings and arrows have had little impact. Indeed, Weil's center now has a waiting list of 1500 patients, and it accepts four M.D. fellows each year for training in a 2-year smorgasbord of therapies that they offer to patients. A panel of 10 specialists in fields from acupuncture to oriental medicine reviews each patient's case and recommends therapies. Fellows consult with patients and jointly create a treatment plan. The center contracts with local practitioners for therapy, and the patients pay.

Weil's influence has spread far beyond Arizona, to the dismay of some of his critics. For instance, Weil follower Lewis Mehl-Madrona, a Stanford-trained M.D., until recently was firmly ensconced at the Center for Complementary Medicine at Shadyside Hospital near Pittsburgh, which is affiliated with the University of Pittsburgh Medical Center. As medical director, Mehl-Madrona promoted Native American "coyote medicine"—

including the use of sweat lodges, guided visions, and massage therapy. A retired computer engineer, E. Patrick Curry, got so upset when he learned that the nearby university was supporting someone who wrote that he had treated cancer with massage that he went on the offensive, writing a scathing critique in Sampson's journal. In response, the university began an investigation; Mehl-Madrona agreed to resign last year. This year, he accepted a new medical director position—at the Center for Health and Healing at the Beth Israel Medical Center in New York City.

The struggle for control of the medical school agenda isn't going away. It surfaced again recently in Washington, D.C., where both the traditionalists and the new alternative medicine practitioners have allies. The Senate appropriations subcommittee that funds the National Institutes of Health (NIH), chaired by Senator Arlen Specter (R–PA), invited Weil to testify on 28 March about the need to increase funding for programs like his. Weil praised the chair and ranking member, Tom Harkin (D–IA), for instructing the NIH to pay more attention to training physicians in integrative medicine. Noting that NIH had "refused to respond" to the Senate's encouragement, Weil requested that the senators appropriate "specific funds ... to achieve this education and clinical training objective."

–ELIOT MARSHALL

MOUSE GENETICS

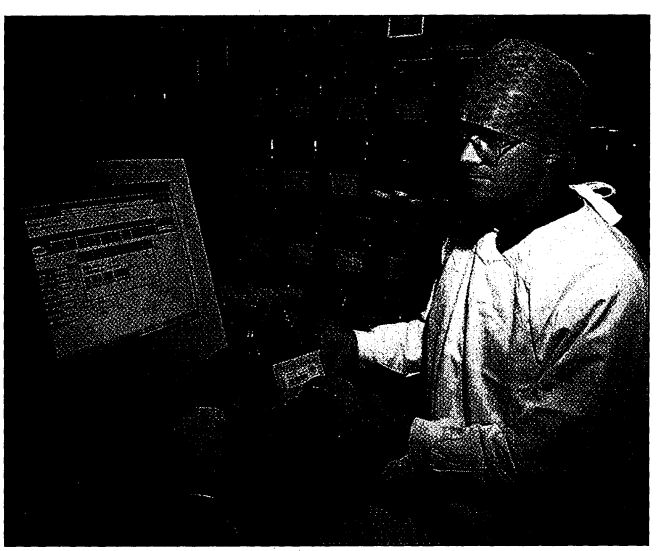
Australian 'Ranch' Gears Up to Mass-Produce Mutant Mice

Chris Goodnow uses the latest technology and sequencing data to advance research on recessive mutations that cause adult-onset diseases

CANBERRA, AUSTRALIA—The overpowering smell of mouse is a sure sign that all is well at the mouse ranch here at the Australian National University (ANU). The aroma means that the state-of-the-art ventilation system is working, protecting the animals from infection by vigilantly flushing would-be mouse germs out of the 20 small rooms where they are caged. Back in the airlock, a cadre of 30 attendants are in various stages of showering, gowning, masking, and slippering as they prepare to care for the 30,000 animals housed on the floor. And while the researchers at the John Curtin School of Medical Research swelter as they toil in aging labs, the mice live in air-conditioned luxury, snug in the Kleenex nests they build to soften their wire cages.

Kid-glove treatment, to be sure, but understandable given the expectations placed on them by their keeper, Chris Goodnow. Goodnow, an ANU immunologist, sees the mice as the key to relieving one of the greatest bottlenecks facing biologists: how to assign functions to the glut of human genes about to appear on computer screens around the world as the Human Genome Project nears completion. The plan is to generate mutants on a massive scale—10,000 mice in 6-month batches for the next 5 years—at an estimated cost of $500,000 a year. "This is big science," says University of California, San Francisco (UCSF), cancer biologist Doug Hanahan. Among the 30,000 are mice with cancer, heart defects, dwarfism, obesity, and immune defects, all resulting from random mutations introduced into their genes. Isolating the responsible genes may allow researchers to find their function. And because mouse genes are thought to do the same thing as their human counterparts, scientists hope to translate the knowledge into clinical studies.

Defying dire predictions from respected colleagues, Goodnow's operation is moving ahead and winning plaudits. "Biology's great strength is science of this sort; it will bring tremendous riches," says Yale University geneticist Richard Flavell. "It's the wave of the future," declares Hanahan.



Chief mouseketeer. Chris Goodnow uses bar codes and specialized software to track his 30,000 mice.

CREDIT: JOHN CURTIN SCHOOL OF MEDICAL RESEARCH/ANU

Goodnow, 40, has been a mouse maître d' for a long time, although not until recently on such a grand scale. Raised in the United States, he migrated to Australia with his family at the age of 12. During graduate study at Sydney University, he developed a strain of transgenic mice whose antibody-secreting B cells, rather than producing a repertoire of millions, were all tricked into producing a single self-reactive antibody. Immunologists used transgenic mice like these to see, for the first time, how self-reactive B cells were either culled or frozen into inactivity at various points of their life cycle.

After arriving at Stanford in 1990, Goodnow used the mice as a microscope to see what goes wrong in mouse mutants that are models of autoimmune diseases. "It's only by understanding things at the level of which cells, what stage, and what biochemical pathway that we can figure out why some people are predisposed to making antibodies that attack their own cells," explains Goodnow. But by 1996, Goodnow had run out of mutants. "The key question was, 'How were we going to move forward?' "

The answer, he concluded, was to delay his research on autoimmunity and instead set up a large-scale operation to create new mutant mice, much like those that fruit fly geneticists have used for decades to identify new genes. Indeed, mouse geneticists have long dreamt of having that capability, but some formidable obstacles stood in the way. Producing the mutations was easy. The chemical, ethylnitrosourea (ENU), has shown phenomenal mutation rates in mouse sperm cells, some 10-fold over what had been achieved in flies. Even so, tens of thousands of mice would be needed to ensure that the random mutations would eventually cover every gene. And housing and caring for that many mice would require a new lab and lots of steady funding.

Beyond the cost considerations were technical problems. Once an interesting mutation is found in fruit flies, it is mapped to a rough location on the chromosome by crossing the fly to a strain that carries chromosomal markers. But mapping mutations in the mouse is a slow and imperfect art, taking