

# Yin and Yang

## Western science makes room for Chinese herbal medicine

By CORINNA WU

**A**fter watching her father put up with allergy shots for 20 years, Ann Bergeron resolved to treat her own allergies another way. On the recommendation of a friend, she sought the help of a Chinese doctor in San Francisco. During her first visit, instead of the usual scratch tests, the doctor spoke to her for about half an hour, asking about her lifestyle and medical history. At the end of the session, the doctor wrote out a prescription.

Bergeron took the piece of notebook paper, filled with cryptic Chinese characters, to a pharmacy deep in the heart of Chinatown. There, the pharmacist carefully measured out the ingredients, which Bergeron says looked like the components of a witch's brew: beetles with hairy legs, lichen, toadstools, and colored powders. Every other night for several months, she boiled this concoction into a "tea from hell" and drank it.

Bit by bit, her allergies went away.

Increasingly, people are putting aside their understandable squeamishness in order to sample the touted benefits of Chinese herbal medicines. Skeptics might attribute Bergeron's recovery to a placebo effect and not to any specific biochemical benefit. But many swear by herbal medicine, taking it as a supplement to—or even substitute for—conventional drugs. Herbs provide a gentler way to treat ailments as well as to boost the body's own defenses, enthusiasts say.

Many medical researchers in the United States and Europe suspect ancient remedies may also harbor new drugs. Government, industry, and academic research groups are zealously mining this potential source of pharmaceuticals, probing Chinese herbs for the chemical constituents that might one day yield new treatments for everything from asthma to AIDS.

But proponents of traditional Chinese medicine say this fervor to isolate single compounds is misplaced. To them, the real benefits come from whole herbs and herbal extracts, since the chemicals in them purportedly work in conjunction with one another.

The United States, however, supports

very little research into whole herbs—in part because its drug approval process doesn't accommodate undifferentiated mixtures of natural chemicals whose collective function is uncertain, notes Mark Blumenthal of the American Botanical Council in Austin, Texas. A dearth of research in this area stems from a clash between two medical cultures—one representing a modern society searching for magic bullets, the other belonging to an ancient society steeped in history and tradition. But the public demand for remedies, no matter what they might be, is challenging scientists and policy makers to find common ground.

**P**ractitioners of traditional Chinese medicine almost always prescribe a mix of herbs, tailoring complex formulas to the individual's condition. To Western ears, the ingredients in Bergeron's allergy preparation sound bizarre, but her doctor most likely knew the function of each.

"Chinese herbal medicines have the most extensive documentation among all the cultures," observes Albert Y. Leung, a Glen Rock, N.J.-based private consultant and expert in pharmacognosy, the study of natural drug materials. He notes that the healing properties of these herbs—collected through experience—"have been documented for at least 2,500 years now."

By contrast, Western medicine places emphasis on pure compounds known to possess a specific biochemical effect—inhibition of a particular enzyme, for example. Potential drugs run a gauntlet of animal testing and human clinical trials to ensure their quality, safety, and effectiveness. The same drug should work over a large population, with adjustments in dosage for different people.

In recent years, several pharmaceutical companies have formed to develop such drugs from Chinese plants: Pharmagenesis in Palo Alto, Calif., and Natural Pharmacia International in Research Triangle Park, N.C., are two.

Leung, who studied at National Taiwan University in Taipei and the University of



*The Chinese treat asthma and bronchitis with a tea brewed from the ginkgo (Ginkgo biloba). European studies show that ginkgo leaf extracts improve mental function in Alzheimer's patients.*

Michigan in Ann Arbor, is working to bridge the information gap that divides the two medical systems. The National Cancer Institute (NCI) awarded him a grant several years ago to compile a database on the medicinal effects of Chinese herbs. Norman Farnsworth and his colleagues at the University of Illinois at Chicago are cataloging a broader range of plants from all over the world, also for NCI. The agency plans to use both databases to find possible leads for an ongoing program that is screening natural products for anticancer and anti-AIDS properties.

Each year, the institute receives some 4,000 samples, representing from 1,000 to 2,000 species of plants, herbs, microbes, and marine organisms, notes Gordon Cragg, chief of NCI's Natural Products Branch in Frederick, Md. Researchers test organic and water extracts from each sample against 60 human cancer cell lines and the AIDS virus. Those that selectively kill their target then go through purification processes to isolate the chemical constituents responsible. A compound that clears these hurdles can start the journey toward clinical trials and approval as a drug.

Only about 1 or 2 percent of the 70,000 extracts that NCI has screened since 1986 turned out to be selective killers, Cragg says. And many of these proved too toxic for use in humans. In fact, between 1960 and 1980, the program produced only two successful drugs, both anticancer agents: taxol from the Pacific yew (SN: 4/02/94, p.223) and a chemically-modified version of camptothecin (SN: 6/04/88, p.358), a compound from the Chinese *Camptotheca acuminata* tree. Still, Cragg believes the potential benefits justify NCI's comprehensive search. Promising compounds "don't come up very often, but when you find them, the benefits to people suffering from cancer or AIDS are immense," he says.

Indeed, the dread posed by these and other devastating diseases drives both the research into natural products and the public's move toward herbal remedies.

"Modern medicine has been very good to us," Leung says, especially in treating infectious diseases. But now, many major illnesses have strong ties to diet and lifestyle—heart disease, obesity, high cholesterol—which drugs alone cannot always fix. The desire to prevent disease is "why so many people are turning to traditional Chinese herbal medicine," he suspects.

**B**ut determining scientifically how these herbal medicines help fight disease isn't straightforward.

Most of the research done on whole herbs takes place in Europe, particularly in Germany, where laws regarding medicinal plants are more relaxed. "Current regulations in the United States require that a drug be identified as a single chemical entity," Cragg says.

"When you get a single chemical," he notes, "you know absolutely that it's 99 percent pure." But an extract from a plant may contain thousands of different compounds. Moreover, he points out, their chemical constituents may vary depending on such factors as where the plant is grown or when it's harvested.

Although proponents of whole herb research acknowledge this concern about consistency, they also argue that striving to isolate individual compounds misses the point. Many single chemicals are toxic, Leung says, and provide therapeutic benefit only when delivered in combination with others in the plant.

He likens this to the combination therapy used to treat cancer. Because the dosage of each drug mixed into a therapeutic cocktail is lower than if it were used alone, side effects diminish. This multipronged approach also increases chances of successfully treating a cancer. Similar principles guide Chinese medical practitioners as they assemble complicated herbal formulas. But in the case of combination therapy, Cragg notes, each drug is well-characterized—unlike the unknown blend of myriad chemicals in a plant.

One way to get the best of both worlds may be to conduct research into controlling the growth of plants. By monitoring the active compounds or other marker chemicals, researchers might ensure the quality and consistency of whole herbs—and any later extracts.

Researchers in Great Britain are doing some of that work, Blumenthal says, but there isn't much incentive for it. The primary reason for this apathy, he charges, is financial: No one can patent a plant.

Coaxing a chemical through clinical trials can cost upward of \$100 million, and it may take years before the drug reaches the marketplace. Nobody will make that kind of investment without some assurance that they will be able to recoup it later through some form of exclusive marketing rights, "which you get with a patent," Blumenthal observes.

And, he points out, herbal products are generally not patentable.

Ironically, the money spent bringing a drug through trials drives up its price, which in turn drives consumers toward the less expensive—and often unconventional—alternatives, such as herbal remedies. "The fact is that consumers are leading the revolution in natural medicines," Blumenthal says. "Consumers are using these products despite criticism from the Food and Drug Administration (FDA) and despite the fact that they are not approved with proper labeling for use." He says, "People see health care in a different paradigm now. They do not see it as just taking drugs when you're sick to get better. It's seeing health care as a higher form of wellness"—exercise, improving one's diet, taking vitamins and herbs, and practicing meditation or other stress control techniques.

A demand for reliable information has stimulated research into herbs and their effects. In 1992, the National Institutes of Health created an Office of Alternative Medicine (OAM) to evaluate therapies ranging from homeopathy and music therapy to acupuncture. OAM funded more than 40 different research projects over the past 2 years, five in Chinese herbal medicine.

Research centers at universities and other institutions have sprung up as well. For instance, David Eisenberg of Harvard Medical School recently opened a Center for Alternative Medicine Research at Beth Israel Hospital in Boston.

The Dietary Supplement Health and Education Act of 1994 has also created a new category for products that fall somewhere between foods and drugs. This law now allows manufacturers to label products with some "structure and function" claims—such as how the product may help to maintain certain conditions in the body—as long as they're supported by a significant cache of scientific evidence. However, such products must also carry disclaimers noting that the FDA has not evaluated them and that they do not prevent, cure, or treat disease.

**N**ot everyone finds this interest in herbal medicine laudable. Opponents see it and other unconventional therapies as signs of a dangerous antiscience trend, one that puts anecdotal information above rational thought.

Others worry about consumers falling prey to quackery and too-good-to-be-true cures.

William Jarvis, president of the National Council Against Health Fraud in Loma Linda, Calif., calls the idea of whole-herb effects "ideological pap," unsupported by scientific evidence. Herbal proponents, he says, have "a love affair with nature that sees it only as benign or benevolent, without looking at the dangerous side."

His organization regards the Dietary Supplement Act as a loophole through which companies can sell inferior products. "We don't really have any problem with herbs per se, as long as they're marketed with the same standards of accuracy and labeling [as drugs]," Jarvis says. Instead of being a way for consumers to get more information, he contends, the act creates a double standard.

Jarvis also dismisses the idea that lack



Joseph Beitel/New York Botanical Garden

*Herbalists prescribe the starchy roots of kudzu plants (Pueraria lobata)—shown here in a Chinese market—for colds, diarrhea, and hangovers. Scientists at Research Triangle Institute in Research Triangle Park, N.C., have found that a compound in kudzu reduces alcohol cravings.*

of patenting rights discourages groups from conducting research into herbal remedies: "You can't patent vitamins either, and yet it's a \$4 billion industry."

**B**oth traditional Chinese medicine and Western drugs can coexist, say Blumenthal and Leung. Indeed, Beijing will host an international conference on drugs from natural products next month, with presentations by such pharmaceutical giants as Smith-Kline Beecham, Bristol-Myers Squibb, Eli Lilly & Co., Upjohn, and Merck.

One herbal medicine practitioner noted that the Chinese look at their history as one massive, 2,500-year-long clinical trial. To them, the simple fact that people are still medicating with herbs is sufficient evidence of their safety and efficacy. But to a more skeptical U.S. medical community, applying modern scientific research methods to ancient wisdom may bring these once opposing medical cultures closer.