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From the Los Angeles Times

Out of the spice box, into the lab

Turmeric, an Indian staple, has long had medicinal uses. Now the West is taking notice.

By Hilary E. MacGregor

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The goddess of turmeric brings color in life

It is the ornament of married woman

And any woman who puts turmeric in her purse,

Her purse will never be empty

An old Indian folk song praises turmeric, the golden spice from the East, for its power to bring beauty, good health and good luck to those who use and carry it.

But in Indian medical lore, the pungent, woody-tasting powder is more precious still.

Modern medicine is starting to sit up and pay attention. Scientists are taking a closer look at this Asian wonder spice, teasing out active ingredients and testing its age-old cultural and medicinal uses in 21st century laboratories. The National Institutes of Health has funded at least eight studies investigating turmeric. The spice and a chemical it contains — curcumin — are being probed for their potential to prevent and treat a broad range of diseases: cancer, cystic fibrosis, Alzheimer's and arthritis.

The uses of turmeric, some described in ancient Indian medical texts, are indeed numerous. Indians put the spice on their Band-Aids as a disinfectant (Johnson & Johnson even makes turmeric Band-Aids for the Indian market) and sprinkle the powder on wounds to help them heal faster. People gargle with turmeric when they have laryngitis and rub it on the skin to cure cuts and psoriasis. They swallow it to treat bronchitis and chronic diseases such as diabetes.

Indian brides and grooms apply turmeric and milk to their skin before marriage, to look more beautiful.

And as anyone who has ever prepared a curry knows, turmeric is an essential cooking ingredient, used to flavor, color and preserve.

"You will find no house in India without turmeric. It is our daily spice, our daily life," said Vasant Lad, an Indian-trained practitioner who is chairman of the Ayurvedic Institute in Albuquerque.

Most of the studies so far have been on animals. But a growing number of mainstream researchers see turmeric and curcumin as possible aids in preventing and fighting disease in humans.

A powerful antioxidant

A relative of ginger, turmeric is a powder ground from the root of a large-leafed Asian plant. Researchers believe the curcumin it contains fights disease partly by shutting down a powerful protein that promotes an abnormal inflammatory response in the body. The spice also has potent antioxidant properties (and may even lower cholesterol).

Curcumin is medically promising because inflammation and oxidative damage are contributors to so many diseases, such as Alzheimer's, Parkinson's, arthritis and various cancers, said Gregory Cole, a professor of medicine and neurology at the David Geffen School of Medicine at UCLA who has conducted numerous studies on the spice.

And, he said, there's a need for better, safer drugs to treat these conditions.

"If it is not curcumin, we need something a lot like curcumin — something cheap and safe with a long history of use, and no side effects," Cole said.

Some clues as to turmeric's clout come from observing patterns of illness among people.

For example, scientists have long noted that Indians have much lower rates of certain cancers than their American counterparts. That led researchers to wonder whether diet plays a role — and, more specifically, the turmeric.

Mouse studies at the University of Texas M.D. Anderson Cancer Center have shown that the spice blocks growth of a skin cancer, melanoma, and inhibits the spread of breast cancer into the lungs.

One 2004 study with mice showed that adding curcumin to Taxol, or paclitaxel, a commonly prescribed chemotherapy for breast cancer, enhances the drug's effect, making the therapy less toxic and just as powerful.

Such studies have triggered two human clinical trials. One is testing the ability of curcumin tablets to help patients with pancreatic cancer, which kills 30,000 people a year. (Only 50% of patients with pancreatic cancer will live longer than six months.) Fifty patients will receive eight grams of curcumin daily, and researchers will evaluate their six-month survival rate.

A second, more preliminary clinical trial is examining a safe and active dose of curcumin in patients with multiple myeloma, a rare cancer of the bone marrow. If the trials pan out, curcumin may have an added advantage: Unlike most cancer therapies, it appears to have no toxic side effects.

The active component of turmeric turns out to be the best blocker yet of a natural chemical called TNF, or tumor necrosis factor, which contributes to cancers and arthritis and is resistant to chemotherapy drugs, said Bharat B. Aggarwal, professor of cancer medicine in the Department of Experimental Therapeutics at the University of Texas M.D. Anderson Cancer Center, who has studied the spice for a decade.

"You don't even need tens of thousands of dollars of TNF blockers," Aggarwal said. "Turmeric does exactly the same thing."

Turmeric is also being studied for its ability to help treat Alzheimer's disease. The prevalence of Alzheimer's among adults in India aged 70 to 79 is among the world's lowest. It is 4.4 times less than the rate in the United States.

A 2004 study with mice published in the Journal of Biological Chemistry suggested that curcumin might be of help for Alzheimer's patients.

The study, conducted by UCLA and Veterans Affairs scientists, showed that a rodent chow laced with curcumin slowed the accumulation in mouse brains of protein fragments known as beta amyloids. They are considered key to the development of Alzheimer's.

Curcumin did this more powerfully than many other drugs being tested as Alzheimer's treatments, said Cole, the study's principal investigator.

Scientists at UCLA are now conducting the first-ever clinical trials of curcumin on humans with Alzheimer's. In this pilot study of 36 patients, researchers will examine how well people tolerate high doses of curcumin and how well it is absorbed into the body. During the 48-week study, researchers will also test whether the spice affects chemicals in the blood and cerebrospinal fluid that indicate

Alzheimer's disease activity, said Dr. John Ringman, assistant professor of neurology at the UCLA Alzheimer's Disease Center.

Meanwhile, researchers at the University of Washington and Johns Hopkins are conducting early human trials looking at whether curcumin can be used as a potential therapy for cystic fibrosis. This is the most common fatal genetic disease in whites, creating a salt imbalance that leads to thick, sticky mucus in the lungs and early death.

A study published in 2004 in the journal *Science* reported that curcumin corrected the genetic defect in mice with a cystic fibrosis-like condition. The human trial will give nine cystic fibrosis patients curcumin for two weeks to see if large doses of the spice are safe and well tolerated and if they efficiently enter the blood.

The researchers will also look at how much chloride they find in the sweat of the cystic fibrosis patients taking curcumin: A reduction would tell them that the chemical was helping to correct the disease.

If curcumin is useful, a slightly altered curcumin may be even more so. With that in mind, a team at Emory University has patented a synthetic variation of curcumin that stays in the bloodstream longer than the real thing. A North Carolina biotech company, Curry Pharmaceuticals, has licensed that compound: Scientists there are developing drugs for cancer, inflammatory diseases and possibly psoriasis, says company chief executive Dennis Schafer.

While intriguing, experts caution that all these results are still preliminary. No one yet knows if turmeric will end up another herbal fad or make a lasting contribution to Western medicine.

Dr. David Knopman, an Alzheimer's researcher at the Mayo Clinic in Rochester Minn., said many ideas in his field come from animal work, and the potential of turmeric seems biologically plausible. But until these compounds are tested in people there is no way to know their full potential, he added.

"We know turmeric has been used for hundreds of years, if not thousands, in China and Indonesia and is very valuable to these people," added James Adams, a professor at the USC School of Pharmacy. "It is clearly a very useful plant that we need to know more about. Basically we are waiting for more studies."

But some are not waiting for more science. In the health food stores, turmeric supplements are selling like hot samosas. And some doctors have brought the spice into their clinics.

Dr. Madalene Heng, a Ventura County-based dermatologist, is already marketing a curcumin-based product. She has developed Psoria-Gold, a topical ointment that she says will treat psoriasis, acne and rosacea. A 6-ounce vial costs \$89.95, but Heng says the cream is so potent even in small doses that it will last six months. One treatment for psoriasis will make the skin disease disappear, Heng claims.

And, she says, it will even smooth away wrinkles.

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