

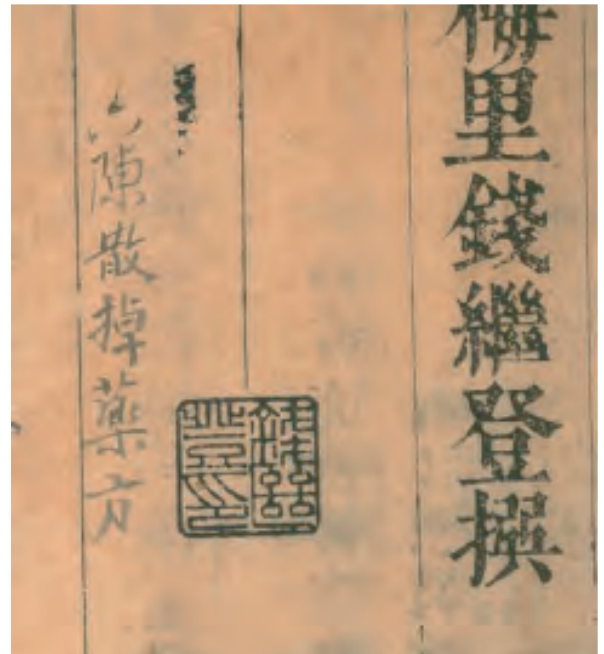
East Meets West

Showering one day in 1997, Mary Tagliaferri '88 found a lump in her right breast. It was a Stage I cancer. She had turned thirty just weeks before and was already planning to add an MD to her master's degree in traditional Chinese medicine, but breast cancer inspired her to do even more. "I was facing mortality at a young age," she says. "I decided to work on things that truly had meaning for me, because you never know how long you'll be here." Now a doctor, she has co-founded Bionovo, a pharmaceutical company with a unique niche: geared toward women, it derives drugs from medicinal Chinese herbs.

Bionovo's first medication, for hot flashes, is scheduled to undergo a final phase of FDA testing this summer and hit the market in 2010. Other drugs in development aim to treat vaginal atrophy and advanced metastatic breast cancer. "I wanted to show that traditional Chinese medicine worked in the same type of double-blind, placebo-controlled clinical trials that we run in Western medicine," Tagliaferri says. "If this medicine works, then you should be able to prove its efficacy in the same types of clinical models."

Tagliaferri became interested in traditional Chinese medicine—which combines acupuncture, massage, and plant-based treatments developed over thousands of years—when a massage therapist cleared up a musculo-skeletal problem with acupressure. She says its techniques seem to work best on illnesses that Western medicine treats with less success, like gastrointestinal problems, migraine, and asthma. Still, she says, Western medicine has its strengths. "If you have a broken arm, by all means, go to the emergency room and get a splint," she says. "If you have cancer, it's likely you'll benefit the most with surgery, chemotherapy, and radiation, but traditional Chinese medicine can help to abate the side effects from those types of rough treatments and provide overall well-being while you go through them."

It may also provide an untapped source of new drugs. Many Western medicines are also derived from herbs; aspirin comes from willow tree bark, while digoxin, used to treat various heart conditions, is an extract of fox-glove. "That's been around for centuries, and it works well," says Rache Simmons, a breast cancer surgeon at the Iris Cantor Women's Health Center, which is affiliated with Weill Cornell Medical College. "It's certainly not a ridiculous idea that some herbs have potentially beneficial effects." According to Tagliaferri, 72 percent of infectious disease medicines are based on natural



With ancient herbs and modern drug trials, globally trained MD aims to improve women's health



Mary Tagliaferri

World health: Mary Tagliaferri '88 has both an MD and a master's degree in traditional Chinese medicine.

products, as are 62 percent of chemotherapy drugs. "Combinatorial chemistry, where a scientist sits at a computer and develops chemical molecules to create drugs, hasn't been very successful. It makes sense to go back to nature, which may be far more clever than a scientist in a lab at developing potential compounds." Bionovo's drug for hot flashes comprises twenty-two herbs, including astragalus, anemarrhenae, and licorice, that link to one of the body's estrogen receptors.

Estrogen is key to women's health: too much of the hormone may cause cells to proliferate in the breast, while too little causes menopause—and problems like hot flashes, vaginal dryness, osteoporosis, and insomnia. Breast cancer patients are often treated with an anti-estrogen

drug that induces a chemical menopause. "There's a whole host of menopausal symptoms that are extremely common and incredibly annoying, if not actually physically dangerous," says Simmons. "It's definitely a huge issue for our patients."

Bionovo grew out of a clinical research program that Tagliaferri, who majored in agricultural economics on the Hill, initiated while attending med school at the University of California, San Francisco. At UCSF, Tagliaferri developed and tested a series of herbal formulas with an unusual team: an acupuncturist who specialized in oncology and an oncologist interested in the anti-cancer properties of Tibetan herbal medicines. Eventually two drugs, for breast cancer and menopausal symptoms, showed promise in preliminary trials. In 2002, Tagliaferri and the acupuncturist, Isaac Cohen, sold their houses and founded Bionovo. One of Silicon Valley's few female entrepreneurs, she has since helped raise \$50 million from investors. Now Bionovo, a public company traded on the NASDAQ, is worth \$320 million.

Although Tagliaferri has been cancer-free for eleven years, she says she thinks about her fight with the disease every day. "I never thought my diagnosis would set me on a path to develop safer and more effective drugs for the disease that seemed to be ruining my life," she says. "I look back at that time and see that in many ways my personal battle with breast cancer was a gift."

— Susan Kelley