

## Pharmacogenomics: One size doesn't fit all

Some people get buzzed from a half-cup of coffee, while others need three cups before 10:00 a.m. It should be a no-brainer then that the same concept is true for medications. Yet drugs are often prescribed using a one-dosage-fits-all mentality.

The result? Undertreated, overtreated, and sometimes endangered patients. An emerging field called pharmacogenomics addresses this problem by considering how genetic variations affect a drug's efficacy and risks.

**Therapy:** Pharmacogenomics allows physicians to personalize drug therapy, explains Dr. Kiang-Teck "Jerry" Yeo, director of the DHMC Clinical Chemistry and Endocrinology Laboratory. About two years ago, Yeo teamed up with Drs. Lionel Lewis, a clinical pharmacologist, and Gregory Tsongalis, director of molecular pathology, to offer pharma-

cogenomic tests to DHMC clinicians and patients.

**Fewer:** Few academic medical centers have such testing in house. Even fewer—if any—have a group that also interprets the results—which can “sound like gobbledygook” to physicians, says Yeo—and offers recommendations. Doctors often “don't have the time” to learn about all the different normal genetic variants that relate to medications, Yeo explains.

Furthermore, when determining the best drug for a patient, physicians must also consider any other medications the patient is taking. That requires a lot of time and special expertise, which Yeo, Tsongalis, and Lewis are happy to provide.

One procedure they offer is the UGT1A1 test. (DHMC was the first in the country to offer this test. See [http://dartmed.dartmouth.edu/winter05/html/vs\\_genetics.php](http://dartmed.dartmouth.edu/winter05/html/vs_genetics.php) for details on it.) UGT1A1 (UDP-glucuronosyl transferase 1A1) is an enzyme that breaks down the active metabolite of irinotecan (Camptosar)—a first-line drug for colon cancer. Individuals with a particular variation of the UGT1A1 gene process the irinotecan metabolite relatively slowly and need a lower dose. The standard dose would reduce their count of certain white blood cells, making them more susceptible to bacterial infections. About 7% to 10% of Caucasians are believed to have this variation, so the Food and Drug Administration now recommends UGT1A1 testing for anyone taking irinotecan.

The DHMC pharmacogenomics group may be a pioneer in the field, but Lewis considers such work to still be in an “embryonic” stage. So far, physicians have learned about the DHMC pharmacogenomics service by word of mouth.

**Consults:** Now, after performing several consults per month, the group is ready to expand and to begin charging for the tests—which most insurance plans will cover, they say. But they “don't want to launch something without educating folks,” insists Yeo. So the group recently organized a symposium to give physicians a chance to learn more about pharmacogenomics and the group's services.

It's too early to tell if the symposium will generate more consults, says Tsongalis, but “the requests to have the conference [again] are overwhelming.”

JENNIFER DURGIN

## THEN & NOW

A reminder of the pace of change, and of timeless truths, from the 1976 MHMH annual report:

“With the addition of a second cardiac surgeon, Dr. Jose Mijangos, the increased surgical activities so essential to full development of the cardiology program have begun. . . . A special intensive cardiac surgery unit is being constructed in the Intensive Care Unit area. . . . The new centralized Cardiopulmonary Laboratory is now fully active and is a central element to the success of cardiac surgery activities.”



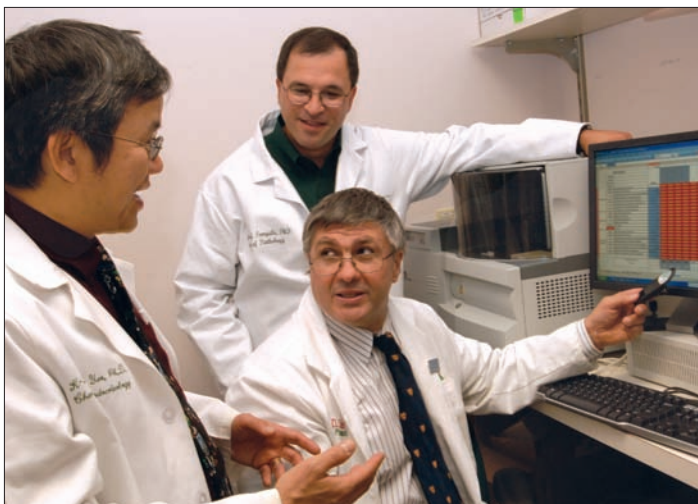
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Number of beds today in DHMC's Coronary Care, Intermediate Coronary Care, and Cardiothoracic Intensive Care Units

> 5,000

Number of procedures annually in the Cardiac Catheterization Laboratories

JON GILBERT FOX



Jerry Yeo, foreground; Lionel Lewis, seated; and Greg Tsongalis have made DHMC one of the first medical centers—if not the first—to have a completely in-house pharmacogenomics group to help physicians personalize complex drug therapies.