

## Protein made by breast cancer gene purified

**A key step in understanding the origins of familial breast cancer has been made by two researchers at UC Davis. The researchers have purified, for the first time, the protein produced by the breast cancer susceptibility gene BRCA2 and used it to study the oncogene's role in DNA repair.**

The results were published online in the journals *Nature*, and *Nature Structural and Molecular Biology*. They open new possibilities for understanding, diagnosing and perhaps treating breast cancer.

BRCA2 is known to be involved in repairing damaged DNA, but exactly how it works with other molecules to repair DNA has been unclear, says Stephen Kowalczykowski, distinguished professor of microbiology in the College of Biological Sciences, Cancer Center member and senior author of the *Nature* paper.



Wolf-Dietrich Heyer

"Having the purified protein makes possible far more detailed studies of how it works," Kowalczykowski says.

Kowalczykowski's group has purified the protein from human cells; another group led by Professor Wolf-Dietrich Heyer, also in the UC Davis Department of Microbiology and co-leader of the Cancer Center's molecular oncology program, used genetic engineering techniques to manufacture the human protein in yeast. That work is published in *Nature Structural and Molecular Biology*.

The two approaches are complementary, Heyer says, and the two teams have been talking and cooperating throughout.

"It's nice to be able to compare the two and see no disagreements between the results," says Heyer.

One application of the purified protein would be to make antibodies to BRCA2 that could be used in test kits as a supplement to existing genetic tests, Kowalczykowski says.

## Cancer center grant boosts prostate cancer research

Cancer Center researchers have received a new, four-year federal grant to investigate molecular pathways involved in the failure of drugs aimed at slowing prostate cancer.

**The \$1.1 million grant from the National Cancer Institute will be used to advance research into how certain molecules work to make cancer cells resistant to treatments that**

**work initially by blocking the cancer-promoting action of the male hormone androgen.** In advanced prostate cancers, even anti-androgen drugs can't prevent reactivation of the androgen receptor, leading to disease progression.

Investigators hope their findings provide insights into how prostate cancer becomes resistant to androgen withdrawal therapies and lead to more effective treatments for the disease.

The grant is one of 21 currently funded projects at the UC Davis Cancer Center tackling the problem of so-called "castration-resistant" prostate cancer, which does not respond to withdrawal of male hormones. Prostate cancer is the most common cancer in American men, and is the second leading cause of cancer death in men. Median survival for men with castration-resistant prostate cancer that has spread to other parts of the body is one to two years.

The new grant, awarded to UC Davis Cancer Center Director and urology professor Ralph deVere White, expands earlier research into the role of tiny strands of genetic material called microRNA in the progression of prostate cancer.

"This is a novel hypothesis," says DeVere White. "If we can understand the functions of microRNA in prostate cancer, and determine whether it can be used as a potential biomarker or drug target for the disease, we can make tremendous progress against this devastating disease."

## Larry Kushi joins cancer center's health disparities research team

**Lawrence "Larry" Kushi, an internationally renowned cancer epidemiologist with Kaiser Permanente Northern California, has joined UC Davis as adjunct professor.**

Kushi, who maintains his Kaiser affiliation as Associate Director for Etiology and Prevention Research for Kaiser's Division of Research, serves as co-leader of Population Sciences and Health Disparities, one of the cancer center's key programs, with Moon S. Chen Jr., UC Davis professor and Associate Director for Cancer Control.

The partnership benefits Kushi's continued epidemiological research at Kaiser as well as bolsters the research being done at UC Davis to study cancer patterns in populations and to reduce cancer health disparities.

"We already have really outstanding work in cancer health disparities led by Moon Chen, and we are excited about building and expanding our program," says Ralph deVere White, cancer center director. "With Larry Kushi we will also have a world-class cancer epidemiologist and comparative effectiveness researcher."