Human geneticist Rick Kittles, PhD. *Photo by Dan Dry*

A new genetic variant

Separate research at the university has uncovered two tiny genetic variations that may help scientists find more precise ways to estimate prostate cancer risk and improve screening and early detection for men of African descent.

Researchers from the University of Chicago and the Translational Genomics Research Institute (TGen) in Phoenix, Ariz., reported the results in the December 2007 issue of the journal *Genome Research*.

The researchers set out to determine whether results from four previous studies that linked genetic variations on one region of chromosome 8 to increased prostate cancer risk among Caucasians also were valid for men of African heritage. In the process, however, they found an additional genetic variation among African-American men that was an even stronger marker for cancer risk for these men. That variation is located within a gene that plays a role in DNA repair. A malfunction in DNA repair could contribute to cancer development.

"This finding emphasizes the importance of ancestry in studying genetics," said study author Rick Kittles, PhD, associate professor of medicine.

Research groups led by Kittles and by John Carpten of TGen analyzed the region of chromosome 8 highlighted by the earlier studies done on Caucasian men. But this time they searched for tiny genetic differences between 490 African-American men who had been diagnosed with prostate cancer at Howard University Hospital in Washington, D.C., and 567 African-American men without cancer.

The researchers were able to replicate the link between one of the markers detected by previous studies and increased risk. More important, they found a new genetic marker, known as rs7008482, that was even more strongly associated with prostate cancer in African Americans. This marker was located within a gene that is involved in DNA replication, recombination and repair.

Altering this gene could confer an "inherited predisposition to genetic instability," Kittles said. "This could lead to increased cancer risk. By studying this region, we may be able to develop molecular targets for improved screening, early detection and possibly treatment."

—Scot Roskelley and JE

"This finding emphasizes the importance of ancestry in studying genetics."
—Rick Kittles, PhD, associate professor of medicine

Crossing research boundaries

Four Chicago faculty members have won National Institutes of Health grants to pursue biological sciences research crossing disciplinary boundaries. In the BSD, psychiatrist Kristen Jacobson and hematologist/oncologist Dorothy Sipkins each received $1.5 million grants. Jacobson will study the effects of individuals, family, peers and neighborhood on adolescent problem behavior. Sipkins will investigate molecular characteristics of microenvironments within bone marrow and how normal, healthy hematopoietic stem cells compete with malignant cells to occupy these coveted niches. Physicist Margaret Gardel and chemist Rustem Ismagilov were awarded $2.5 million each. Gardel will study differences between living, biological matter and inert, physical matter, which could lead to new therapies for cancer and other diseases. Ismagilov studies microfluidic technologies—the flow of fluids through channels thinner than a human hair—for aging and disease research.

Gene mixing

In Greek mythology, the Chimera was a fire-breathing she-monster with a lion's head, a goat's body and a serpent's tail. But the latest incarnation is much fuzzier—and smaller—than the original. University of Chicago researchers have teamed up with Chinese and British scientists to create hybrid offspring of a field mouse and a wood mouse. This chimera marks the first time researchers have used stem cells from two mammalian species to create a third, new species. Though both are rodents, the wood mouse and the house mouse have evolved separately for up to 20 million years. Their genes differ by as much as 18 percent—about 12 times the difference between human and chimpanzee. "We're going to continue with these animals for a while to see if we can understand the developmental cues and learn how to manipulate the system," said geneticist Bruce Lahn. Researchers also plan to merge stem cells from mice and rats, which have vastly different body sizes and a 20 percent genetic difference.