Hutchinson Center receives $7.6 million federal grant to study how genetic variations influence risk of common diseases

SEATTLE — July 17, 2008 — Researchers at Fred Hutchinson Cancer Research Center have received a $7.6 million, four-year grant from the National Human Genome Research Institute to better understand the genetic and biological roots of common diseases. The Hutchinson Center is one of four U.S. research institutes to receive grants totaling about $31 million toward this effort.

The Hutchinson Center project, led by biostatistician and principal investigator Charles Kooperberg, Ph.D., and epidemiologist and co-principal investigator Ulrike "Riki" Peters, Ph.D., both of the Center's Public Health Sciences Division, will study how specific genetic variants influence the risk of diabetes, heart disease, cancer and other common conditions, from obesity to dementia.

Mining more than a decade of data from the Women's Health Initiative, an ethnically and socio-economically diverse study population involving nearly 162,000 postmenopausal women nationwide, Kooperberg and colleagues will look also at how previously identified genetic variants are related to biological and physical characteristics associated with disease risk, such as weight, cholesterol and blood-sugar levels, and bone density. The scientists also will examine how lifestyle factors, such as diet, medications and smoking, may interact with genetic factors to influence health outcomes. For example, if a person follows a low-fat diet high in fruits and vegetables, would that lessen or negate the disease risk associated with a specific genetic variant?

"Through previous genome-wide association studies we know there are common genetic variants in the population that are associated with a moderate increase in the risk of various diseases. Now we want to know how environmental exposures and lifestyle factors, such as diet or smoking, influence disease risk in people with these genetic variants," Peters said.

Another goal of the study is to examine the pathways by which these genetic variants influence disease. "We hope to learn more about the mechanisms by looking at the associations between these genetic variations and intermediate biomarkers of disease, such as cholesterol levels as a marker for heart disease and bone density as a marker for hip fractures," she said.

To this end, the researchers will aim to genotype blood samples from 58,000 WHI study participants to investigate up to 100 known disease-specific genetic variants.

"Information generated from this study will be critical to determine the health impact of any given genetic variant and to prioritize them for intervention studies aimed to reduce their associated risk," Kooperberg said. "These findings may also provide valuable insights into disease pathways and mechanisms, and identify targets for disease screening, prevention and treatment."

The Hutchinson Center's Public Health Sciences Division houses the Clinical Coordinating Center for the Women's Health Initiative, one of the most definitive, far-reaching studies of postmenopausal women's health ever undertaken in the United States. Enrollment began in 1993 and participants will be followed at least until 2010. The study examines the prevalence and risk factors for a number of diseases common in aging women, as well as the effects of various interventions, from low-fat diets and hormone therapy to calcium and vitamin D supplementation.

"We are extremely grateful for the study participants who have provided a wealth of biological data that will permit us to link genetic variants to relevant intermediate biomarkers that will potentially provide important clues to the biological basis of the disease," Kooperberg said.

Also collaborating on the project, in addition Kooperberg, Peters and colleagues from the WHI Clinical Coordinating Center, are investigators from the University of Arizona Cancer Center, Ohio State University and the University of Pittsburgh.

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