Innovative Statistical Approach to Genetic Association
Untangling the relationship between genomics and disease

Public Health Genomics Requires New Statistical Methodologies

Recent advances in the study of human genetic variation and its relationship to disease represent some of the most important findings in the history of medicine and public health. New ways of collecting and assessing these data can provide researchers with the critical tools to understand these relationships and transform data into life-changing results.

Short-term Aims

• *The Discovery Phase*

An initial focus on the development of statistical genomics methodologies and public-use analytic software will benefit the research community, which will be able to use these innovative approaches to uncover disease-gene relationships that might have otherwise been overlooked. Early work will accelerate the examination and assesessment of genes and gene-environment interactions on disease.

Long-term Goals

• *The Public Health Benefit*

Long-term effects will surface in the treatment and prevention of disease that results from the discovery phase. Cancer, diabetes and obesity are among the most promising targets for disease treatment and prevention as a result of genomic analysis. Long-term beneficiaries are future patients and the public, who will profit from improved genetic screening, targeted therapies, and a better understanding of varying genetic susceptibility with reduced morbidity and mortality.

The development of these novel methodologies will increase recognition for UNC's Gillings School of Global Public Health leadership in the field of statistical genomics.

Leadership

Danyu Lin, PhD, Dennis Gillings Distinguished Professor of biostatistics and **Fred Wright,** PhD, professor of biostatistics at the UNC Gillings School of Global Public Health, lead a team of investigators with a range of genetics and statistical expertise to ensure the focus of the Innovation Lab remains on state-of-the-art study design and genomic technologies.

IMPACT!
Improving Public Health

The Gillings Innovation Laboratory in Statistical Genomics will develop innovative, high-impact methods for analyzing data arising from public health genomics. Modern statistical procedures combined with powerful computing and an understanding of biology, expand the possibilities for improving public health worldwide.

GOAL
To improve the treatment and prevention of diseases of public health significance through a better understanding of genetic association and disease.

PARTNERS
UNC's departments of biostatistics, epidemiology and genetics; Carolina Center for Genome Sciences; Carolina Environmental Bioinformatics Center