What is a GWAS?

Huge progress has been made in learning about inheritance and common diseases. Using a new type of study called "Genome Wide Association Scan" (GWAS), many common variations in genes have been found that are associated with the risk of diseases like cancer, heart disease and diabetes.

A primary function of the chromosomes is to maintain the DNA sequence that a person inherits from his or her parents. DNA has four bases or building blocks: A,T, G, and C. Most of the time, common variation in genes are replacements of one base for another, for example an "A" for a "G", or a "T" for "C", in specific positions in a person's inherited DNA sequence. People who inherit an "A" might be at higher risk for a disease than people who inherit a "G" at that position. The DNA sequence with the "A" in this case is called a "risk allele". In a GWAS, risk alleles are found by comparing millions of these variations across the genome in people with and without the disease. In the future, knowing if a person has these risk alleles may help estimate a person's risk of a disease, may point to which treatment may work the best, or may point to the best ways to prevent the disease.

BPH or benign prostatic hyperplasia, also known as an enlarged prostate, is one of the most common conditions in older men. In fact, most men will develop BPH by the time they are 65. Because the outlet of the bladder in men passes through the prostate, BPH often causes urinary symptoms. While these symptoms can be treated with drugs or surgery, we know very little about what causes BPH and we have no means to prevent it.

To learn about genetic causes of BPH, we will do a GWAS study using the blood samples that men in CLUE II donated in 1989. We will compare variations in genes from men in CLUE II who told us on a survey that they have BPH to men without BPH to find risk alleles.

We are excited about this new type of genetic study and the opportunity it creates for learning about men's risk for BPH and possibly ways to prevent it. In the future, we may do GWAS studies for other diseases and conditions. GWAS studies are for research purposes only. We will not be doing any clinical genetic tests for any diseases or conditions. For this reason, we will not provide you with your GWAS information, but we will share the findings of the GWAS study on BPH and other diseases and conditions in future issues of the Health Letter.

Because a GWAS involves genetic information, we go to great effort to protect your privacy. We would never use your name on the blood sample. Instead, we use a number code. Because a GWAS generates a lot of genetic information on a person, some people may be concerned that even without your name being used on the sample that you could be identified. Because relatives inherit some of the same genes, genetic information about you may give information about your relatives. Also, because people

from similar backgrounds may share some genetic information, your genetic information may give information about people like you.

Another step we have taken to help us protect the privacy of the men in the GWAS study on BPH is that we have obtained a Certificate of Confidentiality from the National Institutes of Health. As we do other GWAS studies, will apply for additional Certificates. With this Certificate, we cannot be forced to disclose information that may identify you, even by a court subpoena, in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. We will use the Certificate to resist any demands for information that would identify you.

You should know about the "Genetic Information Notification Act" of 2008. This US law protects people against discrimination by health insurers and employers based on genetic information.

To obtain more information or if you have questions or concerns about the GWAS on BPH, please contact Dr. William B. Isaacs at the Johns Hopkins School of Medicine by email at wisaacs@jhmi.edu or by telephone at (410) 955-2518; or Dr. Elizabeth Platz at the Johns Hopkins Bloomberg School of Public Health by email at eplatz@jhsph.edu or by telephone at (410) 614-9674.

If you have questions or concerns about your participation in CLUE II, please contact Dr. Kala Visvanathan, the Principal Investigator, at the Johns Hopkins Bloomberg School of Public Health by email at kvisvana@jhsph.edu or by telephone at (410) 614-1112.