Breast Cancer: An Important Public Health Concern

Breast cancer is the most common cancer and the second most common cause of cancer deaths in women in the United States. Genome-wide association studies (GWAS) have helped to identify more than 90 common genetic variations that are associated with breast cancer risk. Although GWAS have greatly enhanced our understanding of the genetic component of breast cancer susceptibility, the results to date explain only a small portion of the estimated genetic contribution to breast cancer risk.

U4C: Stimulating Innovation in Breast Cancer Research

The National Cancer Institute (NCI) is partnering with SAGE Bionetworks to launch “Up for a Challenge (U4C)—Stimulating Innovation in Breast Cancer Genetic Epidemiology” to encourage innovative approaches to more fully explain the genomic basis of breast cancer.

U4C’s Goals

- Make breast cancer genetic epidemiologic data more widely available (when consistent with participant informed consent).
- Increase the number and diversity of minds tackling a tough scientific problem.
- Shift the focus of analysis from individual genetic variants (i.e., single nucleotide polymorphisms or SNPs) to pathways (i.e., combinations of genes, genetic variants, or sets of genomic features).
- Encourage the use of innovative approaches to identify novel pathways, which might lead to the discovery of additional gene sets involved in breast cancer risk.
- Explore the heritable contribution to breast cancer disparities.

U4C participants will be able to request access to genetic epidemiologic data from thousands of breast cancer cases and controls from ethnically diverse populations (see table on page 2). Some of these data sets are being made available to researchers for the first time for this Challenge.

Participants are encouraged to leverage breast cancer GWAS data as well as integrate other publically available data types in order to unravel the complexities of breast cancer risk.

U4C Challenge Prizes

NCI will award up to $50,000 in prizes based on the identification of novel findings, replication of findings, innovation of approach, evidence of novel biological hypotheses, and collaboration.

For More Information

Visit the U4C website at https://www.synapse.org/upforachallenge for more information about the U4C application, due dates, rules, and other FAQs. U4C-related questions can be sent to the Challenge Team at UpForAChallenge@mail.nih.gov or to @NCIEpi on Twitter using the hashtag #UpForAChallenge.
Breast Cancer GWAS Data Available for the U4C

<table>
<thead>
<tr>
<th>Study Accession Number in dbGaP</th>
<th>Study Name</th>
<th>Contact Principal Investigator</th>
<th>Estimated Number of Cases</th>
<th>Estimated Number of Controls</th>
<th>Race/Ethnicity</th>
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<tr>
<td>phs000851</td>
<td>African American Breast Cancer GWAS</td>
<td>Christopher Haiman, Sc.D.</td>
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<td>phs000517</td>
<td>GWAS in African Americans, Latinos, and Japanese</td>
<td>Christopher Haiman, Sc.D.</td>
<td>1,880</td>
<td>1,830</td>
<td>African American, Japanese, &amp; Latino</td>
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<td>phs000383</td>
<td>GWAS of Breast Cancer in the African Diaspora</td>
<td>Olufunmilayo Olopade, M.D., F.A.C.P.</td>
<td>1,500</td>
<td>2,000</td>
<td>African American, African, &amp; African Barbadian</td>
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<td>phs000799</td>
<td>Shanghai Breast Cancer Genetics Study</td>
<td>Wei Zheng, M.D., Ph.D., M.P.H.</td>
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<td>Cancer Genetic Markers of Susceptibility Breast Cancer GWAS</td>
<td>Stephen Chanock, M.D.</td>
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<td>phs000912</td>
<td>Admixture Mapping for Breast Cancer in Latinas</td>
<td>Elad Ziv, M.D.</td>
<td>800</td>
<td>370</td>
<td>Latino</td>
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</table>

**Note:** U4C participants will need to request data access through NIH’s Database of Genotype and Phenotype (dbGaP). Details on the data access request process are available at [http://epi.grants.cancer.gov/dac/da_request.html](http://epi.grants.cancer.gov/dac/da_request.html).