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CONTACT:

Courtney Sill, Ph.D.

856-757-9752

csill@coriell.org

Coriell Institute

Raymond MacDougall

301-402-0911

macdougallr@mail.nih.gov

NIH / NHGRI

LARGE AFRICAN AMERICAN STUDY MAY LEAD TO TREATMENT AND PREVENTION OF HYPERTENSION

Coriell Institute and NHGRI Find Genetic Links to Blood Pressure

CAMDEN, NJ – Researchers from the Coriell Institute for Medical Research and the National Human Genome Research Institute (NHGRI) have announced the discovery of five sites of variation in the genome that are associated with blood pressure in African Americans.

Chronic high blood pressure, or hypertension, underlies an array of life-threatening conditions, including heart disease, stroke and kidney disease. Diet, physical activity and obesity all contribute to risk of hypertension, but researchers also think genetics plays an important role.

Approximately one-third of adults in the United States suffer from hypertension; however, the burden is considerably greater in the African American community, in which the condition affects 39 percent of men and 43 percent of women.

“This research exemplifies the power that genomics brings to medicine and health,” said Michael Christman, Ph.D., president and CEO of the Coriell Institute for Medical Research. “Understanding correlations between sites of variation in the genome and common complex disease, such as hypertension, will allow for more personalized treatments for African Americans and other populations.”

Very few genetic studies have focused on African American populations; this novel work is the largest study of its kind to date.

To produce their findings, researchers analyzed DNA samples from 1,017 participants in the Howard University Family Study, a multigenerational study of families from the Washington, D.C., metropolitan area who identified themselves as African American. Half of the volunteers had hypertension and half did not. To see if there were any genetic differences between the two groups, researchers at the Coriell Institute scanned the volunteers’ DNA, or genomes, analyzing more than 800,000 genetic markers called single-nucleotide polymorphisms (SNPs) using Affymetrix technology.

The researchers found that five sites of variation in the genome – specifically those associated with high systolic blood pressure – turned up more often in people with hypertension than in those who did not have the condition.

They also determined that these five sites were located in or near genes likely involved in biological pathways and networks related to blood pressure and hypertension.

To expand upon their findings, the researchers scanned DNA from 980 individuals from West Africa with and without hypertension. The results confirmed that some of the genetic variants detected in African Americans were also significantly associated with blood pressure in West Africans.

“This is the first genome-wide association study for hypertension and blood pressure solely focused on a population with majority African ancestry,” said the study’s senior author, Charles Rotimi, Ph.D., NHGRI senior investigator and director of the trans-NIH Center for Research on Genomics and Global Health (CRGGH). “Our findings extend the scope of what is known generally about the genetics of human hypertension.”

An existing class of anti-hypertension drugs, called calcium channel blockers, already targets one of the genes, *CACNA1H*. However, the additional genes may point to new avenues for treatment and prevention.

“These findings hold great promise for improved healthcare,” said Dr. Michael Christman. “We are hopeful that similar successes will come of studies, such as the Coriell Personalized Medicine Collaborative, that delve into determining how personal genomic information can be useful in improving healthcare and treatment options of not only African Americans, but of all populations.”

Coriell Institute received a major grant from the W.W. Smith Charitable Trust, a private foundation established by William Wikoff Smith in 1977 based in West Conshohocken, PA, which supported the genome analysis for this pioneering study.

In addition to researchers at the Coriell Institute and NHGRI, scientists from Boston University and Howard University, in Washington, D.C., collaborated on this work, which was published in the July 17 online issue of PLoS Genetics. To view a copy of the article, please click [here](#) .

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About Coriell

The Coriell Institute for Medical Research (www.coriell.org) is an internationally known, non-profit, biomedical research institution headquartered in Camden, NJ. Founded in 1953, Coriell is the world’s leading biobank resource for human cells and DNAs, and has recently initiated the Coriell Personalized Medicine Collaborative[®] research study, a forward-looking project aimed at understanding the utility of genome-informed medicine and identifying genetic variants associated with common complex disease and drug metabolism (<http://cpmc.coriell.org>).

About NHGRI

NHGRI is one of the 27 institutes and centers at the NIH, an agency of the Department of Health and Human Services. The NHGRI Division of Intramural Research develops and implements technology to understand, diagnose and treat genomic and genetic diseases. For more about NHGRI and the NIH, visit www.genome.gov and www.nih.gov.