

African-American study identifies four genetic variants associated with blood pressure

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Case Western Reserve University is part of a landmark study that has discovered four novel gene variations which are associated with blood pressure. The 19-site meta-analysis, involving nearly 30,000 African-Americans, also found that the set of genetic mutations are also associated with blood pressure across other populations.

Epidemiology and biostatistics professor Xiaofeng Zhu, PhD, is co-senior author of the paper, which appears in *The American Journal of Human Genetics*. The Continental Origins and Genetic Epidemiology Network (COGENT) consortium conducted the research, which is the largest genome-wide association study of blood pressure in individuals of African ancestry. Most [gene discovery](#) studies to date have been performed using individuals of European ancestry. Previous genome-wide association studies using samples from individuals of African descent failed to detect any replicable genes associated with blood pressure.

"In addition to their disproportionate suffering, hypertension occurs earlier in life for African-Americans compared to individuals of other ancestries," Zhu explained. "Therefore, it is important to study this population to better understand [genetic susceptibility](#) to hypertension."

Zhu and his colleagues also confirmed that previous findings regarding other genes whose presence correlates with increased hypertension risk.

"Although it is unknown how the genes regulate blood pressure," Zhu added, "our findings contribute to better understanding of blood pressure pathways that can lead to future development of [drug target](#) for hypertension and may guide therapy for clinical care."

Experts estimate genetic make-up accounts for roughly 40-50 percent of individuals' susceptibility to hypertension. Other factors associated with the disease include lifestyle, diet, and obesity. Compared to Americans of European-ancestry, African-Americans' increased hypertension prevalence contributes to a greater risk of stroke, [coronary heart disease](#), and end-stage renal disease.

"We anticipated that individuals of African ancestry share similar biology to other populations. However, differences in genomic make-up between African ancestry and other populations have uncovered additional genes affecting blood pressure, in addition to genetic variants that are specific to individuals of African ancestry," said Nora Franceschini, MD, MPH, nephrologist and research assistant professor of epidemiology at the University of North Carolina at Chapel Hill and first author on the paper.

The next phase of study involving the newly discovered gene mutations will investigate their function using human blood samples at the molecular level. Zhu and his colleagues have begun conducting additional research to determine whether the newly identified genes respond to existing hypertension medications. Individuals typically respond differently to a given medication depending on which gene mutation they carry. The more information researchers gather, the greater opportunity clinicians will have prescribed the drug that is most efficacious based on the patient's specific mutation.

"The research findings do not have immediate implications for treatment, but the hope is that discovering genes associated with disease risks will bring scientists closer to biological pathways and may suggest useful targets for new treatments,"

said geneticist Brendan J. Keating, DPhil, one of co-senior authors of the paper, of The Center for Applied Genomics at The Children's Hospital of Philadelphia and faculty at the Department of Pediatrics at the University of Pennsylvania.

Provided by Case Western Reserve University

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