

African-American & Hispanic Twins Needed For UCSD Study of Hypertension Genetics

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With high blood pressure (hypertension) a major risk factor for coronary heart disease, kidney failure and stroke, physician-scientists are trying to determine what role heredity plays in the onset of this condition, as well as what treatments work best with specific ethnic groups.

One of these researchers is Daniel O'Connor, M.D., a professor of medicine and a hypertension researcher at the University of California, San Diego (UCSD) School of Medicine and the VA San Diego Healthcare System. As part of a \$11.6 million grant from the National Heart, Lung and Blood Institute of the National Institutes of Health, O'Connor has been studying twin pairs for the past three years.

"Twin studies allow us to determine the contribution of inherited traits," he said. "However, of the 245 twin pairs we've studied so far, only 10 pairs have been African-American. We've also had few Hispanic twins in our study. We need more minority twin volunteers."

O'Connor noted that it's especially important to understand the genetic characteristics impacting hypertension in these populations, as high blood pressure is such a serious problem. African Americans, for example, are at higher risk for hypertension than are Caucasians or any other racial group. A recent survey showed that of the more than 65 million Americans with high blood pressure, 38.8 percent are African-Americans, 28.7 percent are from the Mexican-American population, and 27.2 percent are from the non-Hispanic white population.* While persons of Hispanic or Latino descent are the fastest growing segment of the U.S. population, awareness about hypertension is critically low in this ethnic group.**

The twin study by O'Connor's group includes an analysis of participants' blood and urine for biochemical traits such as the release of adrenaline and other factors that influence blood pressure. The response to environmental stress, also thought to be a contributor to the development of hypertension, is measured by sophisticated equipment as the study volunteers experience the physical stress of putting a hand in ice water. This test allows researchers to

measure stress-induced changes in blood pressure and heart rate in twins who have inherited genes, versus individuals who are not identical twins.

Of particular interest to the O'Connor team is how their study results will impact the treatment of hypertension.

"There is tremendous variability in how people respond to medication for high blood pressure," O'Connor said. "It can range from no response at all to an immediate drop in blood pressure. While one person may tolerate a drug well, the next person might develop a rash or cough, suffer fatigue or experience headaches."

These adverse drug reactions are no trivial matter. According to one recent study, two million people are hospitalized each year for reactions to properly prescribed medicines. And, the *Journal of the American Medical Association* has reported that adverse drug reactions are the fourth highest cause of death in hospital patients.

Today, a goal of medical research is to develop a simple DNA test that allows doctors and pharmacists to optimize each individual's drug treatment, with minimal side effects. For example, such a test could involve the doctor or pharmacist gently rubbing a cotton swab inside a patient's mouth to obtain cells containing DNA. Then, tiny snippets of the patient's DNA could be matched with the precise, tailored medication that effectively lowers blood pressure without causing side effects.

O'Connor hopes that his studies with twins will explain the genetic differences in different ethnic groups and eventually lead to designer drugs that directly target the unique genetic characteristics of individuals, with fewer unpleasant side effects.

African American and Hispanic twin pairs, either identical or fraternal, who wish to participate in the UCSD study should contact Elizabeth (Betsy) Lillie at (858) 552-8585, ext. 6158, or send her an email, elillie@ucsd.edu.

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* Study published in the August 23, 2004 issue of the journal *Hypertension: Journal of the American Heart Association*.

** Study published in the June 18, 2004 issue of the *Journal of Clinical Hypertension*.

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