



Biological Determinants of Alcohol Action in Minorities

Developmental Alcohol Research Center: Howard University

Overview: The Howard University Alcohol Research Center's (HUCARC) "Biological Determinants of Alcohol Action in Minorities" conducts basic and clinical alcohol research that expands the knowledge base of scientific information to better define, predict, and treat alcoholism in minority populations. Through a core infrastructure and collaborative arrangements with the Indiana University and University of Connecticut Alcohol Research Centers (ARCs), HUCARC focuses on developing and strengthening alcohol research infrastructure among Howard University faculty investigators, graduate students, post-doctoral students, and professional school students.

The program features five components. The Administrative Core provides the organizational framework, quality-control mechanisms, and core research resource facilities. The Scientific Research Component consists of five research projects (including two pilots) focusing on new, exploratory, and ongoing multi-disciplinary alcohol research. Other research areas include the behavioral genetics of alcoholism and smoking; alcohol's action on the liver and pancreas; the relationships between alcohol dependence, stress, and ethnicity; and alcohol–nicotine interactions in animal models. The Science Education Component disseminates current information and curricula on new research techniques and methods to health professionals and lay audiences within and outside of Howard University. Community outreach activities are conducted through radio/TV broadcasts and participation in health fairs and other events. The Faculty and Research Career Development Component conducts a two-semester Alcohol Graduate Studies Course, an Alcohol Fellows Program, a grant-writing workshop, and a unique research collaboration with the NIAAA Intramural Research Division, as well as advanced research training with the Indiana ARC. The Recruitment and Assessment Core component supports the infrastructure and administrative coordination for ongoing recruitment, screening, and monitoring of participants at multiple sites in research projects supported by the Center.

Results/Outcomes: Studies have examined the potentially positive health effects of genetic variations of alcohol-metabolizing enzymes, including ADH1 B*3, an allele unique to people of African descent and those from certain Native American tribes. This allele is associated with a rapid breakdown of alcohol, which, in turn, leads to a short-term build up of the alcohol metabolism byproduct acetaldehyde. Buildup of this toxic byproduct can make drinking unpleasant. African Americans carrying this allele report experiencing less pleasure from drinking and are less likely to have a family history of alcoholism than are people without this genetic variation. Children of mothers with this allele are less vulnerable to alcohol-related birth defects. Another genetic variation, in the enzyme ALDH1 (ALDH1 A1*2 and ALDH1 A1*3) also is found in African Americans and may be associated with a reduced risk of alcoholism.

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Significance: The research is highly relevant to NIAAA's Health Disparities Research Plan in that it examines how ethnic groups exhibit genetic diversity in their biologic sensitivity to alcohol and, specifically, genetic differences in alcohol-metabolizing enzymes. These studies seek to identify genes associated with vulnerability for alcohol dependence. Furthermore, the creation and substantial progress of this research center has significantly advanced alcohol research infrastructure development among Minority Serving Institutions.

Grant P20-AA-014643 Principal Investigator: Dr. Robert E. Taylor
NIAAA Program Official: Dr. Marcia Scott, mScott@mail.nih.gov