Neuroscience Center of Excellence

Chancellor's Award Lecture
in Neuroscience

Professor Bankole A. Johnson, DSc, MD,

Dr. Irving J. Taylor Professorship and Chair,
Department of Psychiatry,
Professor of Pharmacology, Anatomy
and Neurobiology,
Director, Brain Science Consortium,
University of Maryland School of Medicine
Baltimore, Maryland, USA

**12 p.m.
Monday
October 13, 2014**

**8th Floor
Neuroscience Center
of Excellence
Conference Room**

more info: zdavis@lsuhsc.edu

Personalized Medicine Treatment for Alcohol Use Disorders

Alcohol use Disorder is a heterogenous condition, with symptomatic individuals varying in psychopathology, pathogenicity, treatment response, and prognosis. As a result, treatment response to standard medications can be unpredictable.

Over 20 years of dedicated research has identified the serotonin-3 receptor system to be critical to the expression of the rewarding effects and abuse liability of alcohol. Indeed, serotonin-3 receptors are one of the first to fire to express the rewarding effects of alcohol. The effects of the serotonin-3 receptor are modulated not only by genetic differences at that receptor but also by molecular variants at the serotonin transporter, which gates about 60% of serotonin function. We have shown through biochemical and laboratory experiments in humans that genetic differences at the Serotonin transporter are associated with variation in alcohol preference and drinking. Futhermore, we tested whether variation at the Serotonin transporter and receptor predicts treatment response to ondansetron. We did this by conducting a phase II clinical trial of 285 alcohol dependent individuals that were randomized by genetic difference at the Serotonin transporter. We discovered that the serotonin-3 receptor blocker, ondansetron, was efficacious treatment for alcohol dependence among those with selective genetic variation at either or both the serotonin-3 receptor and the serotonin transporter. This finding offers the possibility of pre-screening individuals with alcohol use disorder by these selective serotonergic genotypes, and subsequently, administering them very low dose ondansetron as a treatment agent. Our work opens up the new horizon of personalized medicine treatment for alcohol use disorder.

Learning points:
1. Understand the role of the serotonin system in alcohol use disorder
2. Understand the importance of genetic variations within the serotonin system as predictors of treatment response to ondansetron
3. Update clinicians on new endpoints for characterizing alcohol use disorder and response to treatment.