

NEWS

Contact:

Paul Oestreicher, Ph.D.

Oestreicher Communications, LLC

paul.oestreicher@ocomms.com

917-536-3523



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Genomas and Institute of Living Among Organizers of Pharmacogenetics Symposium at 2009 Annual Meeting of the American Psychiatric Association *Field Moving Toward Genotype-Guided Psychotropic Therapy*

San Francisco, CA – Gualberto Rúaño, M.D., Ph.D., President of Genomas, and Director of Genetics Research at Hartford Hospital and Simon Kung, M.D., Assistant Professor of Psychiatry at the Mayo Clinic will co-chair a symposium, “*Emerging Clinical Applications of Genotype-Guided Psychotropics for Depressive Disorders*,” today at the annual meeting of the American Psychiatric Association.

“Genotyping is at a point now where it could be used to help guide therapeutic choices,” said the Mayo Clinic’s Dr. Kung. “It is fitting that the Mayo Clinic, Genomas and Institute of Living/Hartford Hospital partnered on today’s symposium since these institutions are among the true innovators in delivering personalized medicine to patients,” he added.

The papers to be presented at today’s symposium are:

Greater Utilization of Psychiatric Services is Associated with Pharmacogenetic Variation and Metabolism Deficiencies

Gualberto Rúaño, M.D., Ph.D.^{1, 2}, Andreas Windemuth, Ph.D.¹, Bonnie L. Szarek, R.N.², John W. Goethe, M.D.²

Genomas Inc.¹ and Institute of Living/Hartford Hospital², Hartford, CT

Cytochrome P-450 2D6, 2C19, and Serotonin Transporter Genotyping for Depressed Inpatients at the Mayo Clinic Mood Disorders Unit

Simon Kung, M.D., Joel G. Winner, M.D., Maureen S. Drews, Renato D. Alarcon, M.D., David Mrazek, M.D.

Mayo Clinic, Rochester, MN

Pharmacogenetic Testing in Psychiatry: Early Adopters’ Attitudes and Practices

Jinger G. Hoop, M.D., M.F.A.

Medical College of Wisconsin, Milwaukee, WI

The Serotonin Transporter Gene (SLC6A4): Understanding Variability and Enhancing the Clinical Utility of Genotyping

David Mrazek, M.D.

Mayo Clinic, Rochester, MN

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The likelihood of having a positive response or developing a side effect to psychotropic medication depends heavily on an individual's genetic make up. Gene variations, therefore, can have a substantial impact on the quality of care as well as the economics of treatment for psychiatric diseases. With the use of atypical antipsychotic drugs expected to climb to six million patients in the U.S. with major depressive disorder, schizophrenia, bipolar disorder, obsessive-compulsive disorder or generalized anxiety disorder, there is a critical need to optimize currently available therapies.

Dr. Ruaño will present results from a study that showed a significant link between certain genetic variations and length of stay and re-hospitalization rates for patients treated for major depressive disorder (MDD).¹ Data were obtained from the DNA of 150 psychiatric in-patients being treated for MDD with antidepressant and atypical antipsychotic (AAP) medications at the Institute of Living/Hartford Hospital.

"These genetic variations may contribute to a reduction in efficacy or an increase in side effects of medications," said Dr. Ruaño. "These could be major contributors to the longer hospital stays and more frequent hospitalizations that we observed."

"Today's symposium is an important step in reaching out to professionals in psychiatry as DNA-guided medicine moves with increasing speed into clinical practice," said Dr. John W. Goethe, Director of the Burlingame Research Center, Institute of Living.

Genomas and the Institute of Living are developing a diagnostic system to predict the risk of these psychotropic-induced metabolic symptoms (PIMS) associated with atypical AAPs (Risperdal®, Seroquel® and Zyprexa®), which affect nearly 30% of patients taking AAPs. A detailed examination of genetic variations and the impact they may have on the development of side effects was also reviewed. Results from other clinical studies showed significant associations between specific genetic variations and the diabetic syndrome that is often induced by AAPs. Specifically, single nucleotide polymorphisms (SNPs) from cardiometabolic and neuroendocrine genes were shown to have a role in drug-induced elevations of triglycerides, cholesterol, blood glucose and weight, as well as appetite.²

"These medical needs constitute a public health imperative for the wide use of DNA typing to help prevent serious side effects in the mentally ill," said Harold Schwartz, M.D., VP Behavioral Health, Hartford Hospital and Institute of Living. "I am confident that DNA-guided medicine will become routine in psychiatry, particularly in high-risk populations with histories of drug resistance and intolerance."

In an authoritative review, Dr. David Mrazek, Chairman of the Department of Psychiatry and Psychology at the Mayo Clinic had described the pharmacogenetics of psychotropics and provided expert commentary on clinical applications.³ He commented: "It is exciting to see a key promise of the Human Genome Project -- personalized medicine -- begin to take root after years of discovery and development. With additional research, I hope and expect that DNA-based diagnostics will become a key tool for medical management in psychiatry and other areas of medicine."

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ABOUT MAYO CLINIC

Mayo Clinic is the first and largest integrated, not-for-profit group practice in the world. Doctors from every medical specialty work together to care for patients, joined by common systems and a philosophy that the needs of the patient come first. Over 3,000 physicians and scientists and 46,600 allied staff work at Mayo which has sites in Rochester, Minn., Jacksonville, Fla., and Scottsdale/Phoenix, Ariz. Mayo Clinic also serves more than 60 communities in the upper Midwest through the Mayo Health System. Collectively, these locations treat more than half a million people each year. Mayo clinic is governed by a 33-member Board of Trustees composed of public members and Mayo physicians and administrators.

ABOUT THE INSTITUTE OF LIVING AT HARTFORD HOSPITAL

Founded in 1822, The Institute of Living was one of the first mental health centers in the United States, and the first hospital of any kind in Connecticut. Today, as part of Hartford Hospital, it is one of America's leading not-for-profit centers for comprehensive patient care, research and education in the fields of behavioral, psychiatric, and addiction disorders. Hartford Hospital is an 867-bed regional referral center that provides high-quality care in all clinical disciplines. Hartford Hospital, founded in 1854, is one of the largest teaching hospitals and tertiary care centers in New England with the region's busiest surgery practice, and has been training physicians for nearly 130 years. Please visit www.instituteofliving.org and www.harthosp.org for more information.

ABOUT GENOMAS

Genomas is a biomedical company advancing DNA-guided medicine and personalized healthcare. The company is developing and testing revolutionary PhyzioType™ Systems for DNA-guided diagnosis and prevention of metabolic disorders induced by drugs used to treat diabetes, and cardiovascular and psychiatric illnesses. PhyzioType Systems are designed to provide physicians with an unprecedented capability to select for each patient the safest drug treatment to enhance compliance. Genomas is located in Hartford, CT on the campus of Hartford Hospital. Please visit www.genomas.net for more information.

ABOUT PHYZIOTYPE™ SYSTEMS FOR DNA-GUIDED MEDICINE

PhyzioType Systems are composed of an ensemble of inherited DNA polymorphisms genotyped by arrays and interpreted by a bioclinical algorithm in order to convey to physicians predicted comparisons of side effect risk among drugs for the individual patient. They are being developed for DNA-Guided Medicine in the prescription of cardiovascular, psychotropic and diabetes drugs and in preventive cardiology. The research leading to the PhyzioType Systems has been published in the renowned journals *Annals of Biomedical Engineering*, *Biomedical Engineering Handbook*, *Molecular Psychiatry*, *Muscle & Nerve*, *Pharmacogenomics* and *Clinica Chimica Acta*. To date, Genomas has secured \$3.3 million from NIH Small Business Innovation Research (SBIR) and filed seven patent applications for PhyzioType System product development.

1. Ruaño G., Villagra D., Rahim U.S., Windemuth A., Kocherla M., Bower B., Szarek B.L., Goethe J.W. Increased carrier prevalence of deficient *CYP2C9*, *CYP2C19* and *CYP2D6* alleles in depressed patients referred to a tertiary psychiatric hospital. *Personalized Medicine*, (2008) 5(6): 579-587.
2. Ruaño G, Goethe JW, Caley C, Woolley S, Holford TR, Kocherla M, Windemuth A, de Leon J. Physiogenomic Comparison of Weight Profiles of Olanzapine- and Risperidone-Treated Patients. *Molecular Psychiatry*, (2007) 12: 474- 482.
3. Black JL, O'Kane DJ, Mrazek DA. The impact of CYP allelic variation of antidepressant metabolism: a review. *Expert Opin. Drug Metab. Toxicol.*, (2007) 3(1): 21-31.