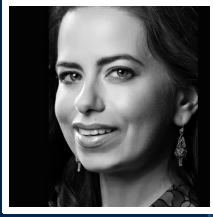# Personalized Neurodiagnostics

Lilianne R. Mujica-Parodi
Associate Professor, Biomedical EngineeringAssociate Neuroscientist & Lecturer

CURRENT RESEARCH

Novel neuroimaging techniques to identify risk and prognoses for psychiatric and neurological disorders

Recent years have witnessed an explosion of interest in neuroimaging the human brain and in using it to predict brain-based disease. However, the field generally conceives of neuroimaging as revealing disease-specific activation areas or networks, rather than explicitly considering the forces that govern the brain networks' development. The conceptual transition—from thinking of neuroimaging as providing a static feature to thinking of its ability to capture a dynamic process—is critical for probing how a disease first develops in the brain, as well as for asking why two individuals—with identical clinical diagnoses—might show markedly different prognoses over time.

Most diseases in the body are "dysregulatory," which means that the negative feedback loops in the body that maintain homeostasis break down in various ways. Importantly, physiological systems often slowly degenerate for years or decades before onset of symptoms.Thus, the ability to identify subtle shifts in the dynamics of those feedback loops would permit treatment of illnesses before they become symptomatic; in the way, for instance, that a glucose tolerance test is currently able to identify pre-diabetes before a person shows any diabetic symptoms. Dr. Lilianne Mujica-Parodi, Associate Professor of Biomedical Engineering at Stony Brook University School of Medicine and Associate Neuroscientist at Massachusetts General Hospital and Harvard Medical School, is developing novel methods to identify subtle signs of dysregulation in the homeostatic control circuits that regulate different brain functions, so that we can identify risk, prognoses, and therefore ultimately more effective treatment, for developing psychiatric and neurological...

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AFFILIATION

Stony Brook University

EDUCATION

- Ph.D. in 1998,Columbia University
- B.A. in 1992,Georgetown University

AWARDS

- Chair, 2012-2014
- Presidential Early Career Award for Scientists and Engineers, 2011
- National Science Foundation Career Award, 2010
- Brain and Behavior Research Foundation Young Investigator Award, 2000
- Niles Whiting Dissertation Fellowship Award, 1998

RESEARCH AREAS

Life Science, Diagnostics, Neurological / Cognitive

FUNDING REQUEST

Your contributions will support Dr. Mujica-Parodi's interdisciplinary team of researchers and state-of-the-art neuroimaging techniques, and will allow ideas to rapidly progress from the proof of principle stage to large-scale clinical trials, as required for FDA approval. A typical 3-5 year study, of 100-200 subjects, costs about $2.3M. Donations will help make these studies possible, bringing neurodiagnostics into clinical practice, and thus enabling doctors to better diagnose, monitor, and treat psychiatric and neurodegenerative disorders in patients.