



MAYO CLINIC

Research Report

Department of Psychiatry
and Psychology

2008

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Welcome to the 2008 Mayo Clinic Department of Psychiatry and Psychology Research Report.

Our department is committed to pursuing outstanding biomedical and behavioral research that enhances patient care, decreases the burden of human neuropsychiatric diseases and mental illness and leads to the development of new diagnostic, therapeutic and preventive measures. A strong commitment to institutional collaboration, mentorship and research education also is vital to our success.

Many of our faculty and trainees regularly present their research at national meetings and coauthor scientific papers in peer-reviewed journals and scholarly book chapters. Many of these investigators have been successful in obtaining National Institutes of Health and other extramural funding.

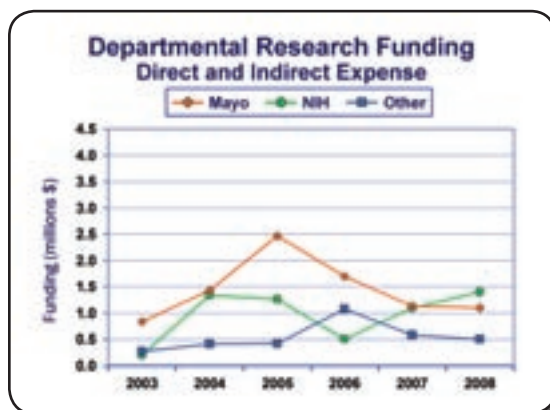
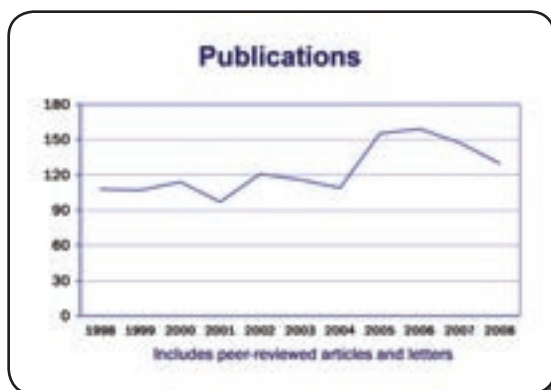
If you are interested in contacting any of the investigators highlighted in this report, please contact our department at 507-266-5100.



David A. Mrazek, MD, FRC Psych
Chair, Department of
Psychiatry Psychology



Mark A. Frye, MD
Chair, Department
Research Committee



Matthew M. Clark, PhD, LP
Vice Chair, Department
Research Committee



Front: Hall-Flavin,
Wieben.
Back: Karpyak,
Koenig, Choi, Mrazek,
Schneekloth, Biernacka

SAMUEL C. JOHNSON GENOMICS OF ADDICTION PROGRAM

Investigators

Joanna Biernacka, PhD, Doo-Sup, Choi PhD, Mark A. Frye, MD, Daniel Hall-Flavin, MD, Victor Karpyak, MD, PhD, Barbara Koenig, PhD, Larissa Loukianova, MD, PhD, Terry Schneekloth, MD, David M. Mrazek, MD, FRC Psych and Eric D. Wieben, MD

The main focus of this multidisciplinary integrated group of clinicians, addiction specialists, clinical researchers, molecular pharmacologists, statistical geneticists, and an ethicist is to advance the neurobiological underpinnings of and genetic vulnerability to addictions. With this background,

our mission is to further develop individualized pharmacogenomics and behavioral treatment interventions to maximize the impact of addiction treatments.

GRANTS

National Institute of Alcohol Abuse and Alcoholism R01 AA015164; CREB, Alcohol Reward and Consumption in ENT1 Null Mice. Funding period: 03/2006 - 02/2011; PI: Choi

Korea Research Foundation KRF-2008-356-C000088, Post doctoral training award. Funding period: 09/2008 - 08/2009; PI: Nam, Mentor: Choi

S.C. Johnson Genomics of Addiction; MPDZ polymorphisms and alcohol withdrawal with seizures. Funding period: 2005 - 2010; PI: Karpyak

Mayo Clinic Departmental Small Grant Program; Hippocampal glutamate levels in subjects with a history of alcohol withdrawal. Funding period: 2008 - 2009; PI: Karpyak

S.C. Johnson Genomics of Addiction; Developing a DNA Repository for Genomic Studies of Addiction; PI: Mrazek

S.C. Johnson Genomics of Addiction; Clinical Correlates of Addiction. Funding period: 2008 - 2009 PI: Frye

Mayo Clinic Departmental Small Grant Award; Adjunctive Varenicline for Smoking Cessation in Bipolar Depressed Patients: An Open-label 12-week Feasibility Trial. Funding period: 08/2008 - 8/2010; PI: Frye and Patten

S.C. Johnson Genomics of Addiction; MR Spectroscopy in Recently Detoxified Patients with Alcoholism: A Acamprosate Probe study. Funding period: 01/2009 - 08/2011; PI: Frye

S.C. Johnson Genomics of Addiction; A Pilot Probe Study of Acamprosate: Genes associated with response. Funding period: 2008-2010; PI: Mrazek

Mayo Clinic Center for Individualized Medicine; Ethical, Legal, Social, and Policy Challenges in DNA Biobanking. Funding period: 07/2006 - 12/2011; PI: Koenig

Greenwall Foundation; DNA as a Unique Identifier: Privacy, Trust, and the Future of Personalized Medicine. Funding period: 07/2007 - 06/2009; PI: Koenig

Navigenics, Inc.; A Proof-of-Principle Trial for Communication to Patients Receiving Multiplex Genomic Screening Information. Funding period: 09/2007 - 09/2009; PI: Koenig

KEY PUBLICATIONS & PRESENTATIONS

Biernacka JM, Tang R, Li J, McDonnell SK, Rabe KG, Sinnwell JP, Rider DN, de Andrade M, Goode EL, Fridley BL. Assessment of Genotype Imputation Methods. BMC Proceedings 2009, in press.

Karpyak VM, Kim J-H, Biernacka JM, Wieben ED, Mrazek DA, Black JL, Choi D-S. Sequence variations of the human MPDZ gene and association with alcoholism in subjects with European ancestry. Alcohol Clin Exp Res 2009 [Epub ahead of print]

Biernacka JM, Cordell HJ. A composite-likelihood approach for identifying polymorphisms that are potentially directly associated with disease. *Eur J Hum Genet* 2008 [Epub ahead of print]

Choi DS, Wei W, Deitchman JK, Kharazia VN, Lesscher HM, McMahon T, Wang D, Qi ZH, Sieghart W, Zhang C, Shokat KM, Mody I, Messing RO. Protein kinase C delta regulates ethanol intoxication and enhancement of GABA-stimulated tonic current. *J Neurosci* 2008; 28:11890-11899

Piderman KM, Schneekloth TD, Pankratz VS, Stevens SR, Altchuler SI. Spirituality during alcoholism treatment and continuous abstinence for one year. *Int J Psychiatry Med* 2008; 38(4):391-406

McKeon A, Frye MA, Delanty N. The alcohol withdrawal syndrome. *J Neurol Neurosurg Psychiatry* 2008; 79:854-862

Abulseoud O, Hellman G, Calabrese J, Verduin M, Chirichigno J, McKowen J, Gitlin M, Altshuler L, Frye MA. Gender and bipolar subtype association with self-reported hazardous alcohol consumption in bipolar depression. *J Dual Diagnosis* 2008, 4(3):291-302

Levander E, Frye MA, McElroy S, Suppes T, Grunze H, Nolan WA, Kupka R, Keck PE Jr, Leverich GS, Altshuler LL, Hwang S, Mintz J, Post RM. Alcoholism and anxiety in bipolar illness: Differential lifetime anxiety comorbidity in bipolar I women with and without alcoholism. *J Affect Disord* 2007; 101:211-217

Chen J, Rinaldo L, Lim SJ, Young H, Messing RO, Choi D-S. The type 1 equilibrative nucleoside transporter regulates anxiety-like behavior in mice. *Genes Brain Behav* 2007; 6:776-783.
Biernacka JM, Cordell HJ. Exploring causality via identification of SNPs or haplotypes responsible for a linkage signal. *Genet Epidemiol* 2007; 31(7):727-740

Choi D-S, Karpyak VM, Frye MA, Hall-Flavin DK, Mrazek DA. Chapter 55: Drug Addiction. In: *Pharmacology and Therapeutics: Principles to Practice*, Waldman and Terzic Eds, Philadelphia: Elsevier, 2008. p. 817-835

Frye MA, Karpyak VM, Hall-Flavin D, Salloum IM, McKeon A, Choi D-S. Chapter 13: Antiepileptics in the treatment of alcohol withdrawal and alcohol use relapse prevention. In: McElroy SL, Keck PE Jr, Post RM, eds. *Antiepileptic Drugs to Treat Psychiatric Disorders* New York, New York: Informa Healthcare USA, Inc.; 2008. p. 251-262

Chen J, Zhu Y, Kawamura T, Janak H, Choi D-S. ENT1 regulates motivational effects of alcohol and glutamate-mediated neuroadaptation. 31st Annual Scientific meeting of the Research Society on Alcoholism. June 28-July 2, 2008; Washington DC

Schneekloth TD, Biernacka JM, Hall-Flavin DK, Karpyak VM, Loukianova LL, Frye MA, Drews MS, Stevens SR, Mrazek DA. Residential alcoholism treatment outcome in a clinical cohort: Relapse rates at 3, 6, 9 and 12 months (Abstract 450). *Alcohol Clin Exp Res* 2008; 32(6 Suppl 1): 192A

Karpyak VM, Vander Weg MW, Biernacka JM, Stevens SR, Cunningham JM, Mrazek DA, Black JL. Interaction effect of SLC6A4 and DRD2 polymorphisms is associated with the history of delirium tremens. XIV World Congress of Psychiatry. Poster: Clinical Psychiatric Pharmacogenomics: The Mayo Clinic Experience. September 20-25, 2008, Prague, Czech Republic

Hall-Flavin DK, Schneekloth T, Loukianova L, Karpyak VM, Biernacka J, Chia K, Drews M, Mrazek DA, Frye MA. Drinking Patterns of Bipolar Women with Alcohol Dependence Admitted to an Intensive Addiction Treatment Program. Presented at the International Conference on Bipolar Disorder. January 2008 Delhi INDIA

PSYCHIATRIC PHARMACOGENOMICS

Investigators

David Mrazek, MD, FRC Psych,
Richard Weinshilboum, MD, Daniel J. Schard, PhD,
Eric D. Wieben, PhD, Donald E. McAlpine, MD,
Daniel K. Hall-Flavin, MD, Pamela J. Netzel, MD,
Joanna M. Brernacka, PhD, John L. Black, MD, and
Mark D. Willams, MD

The “Pharmacokinetics and Pharmacodynamics of Selective Serotonin Inhibitors” is a component of the Mayo Clinic Pharmacogenomics Research Network. David Mrazek, MD is the principal investigator of the project which is fully funded by the National Institute of General Medical Sciences (NIGMS).

The study is the largest research effort to date that

has been designed to examine the relationship between genetic variation and both antidepressant response and adverse effects. Additionally, the metabolic signature of a subset of subjects in this project will be obtained in order to identify an alternative biological marker to predict selective serotonin inhibitor response.

GRANTS

National Institute of General Medical Sciences (NIGMS); Pharmacokinetics and Pharmacodynamics of Selective Serotonin Inhibitors. Funding period: 07/2005 - 06/2010; PI: Mrazek

INDIVIDUALIZED MEDICINE BIOBANK FOR BIPOLAR DISORDER

Researchers will establish a large-scale biobank for Bipolar Type I Disorder, collecting both biologic samples and clinical data from 2,000 individuals. This is a multi-site endeavor, with Mayo Clinic in Minnesota serving as the primary project site. Other sites that will assist in the recruitment of participants include Mayo Clinic in Florida, Mayo Clinic in Arizona, Austin Medical Center - Mayo Health System, The Lindner Center of HOPE, and the University of Minnesota. By establishing the infrastructure of this data-rich biobank, researchers hope to facilitate studies on disease risk and pharmacogenomic probes utilizing state-of-the-art research technology. The identification of genetic risk factors associated with disease onset can potentially lead to early interventional treatment in at-risk patients. This is particularly important in bipolar disorder, as the onset of any treatment is often delayed by more than a decade. Additionally, identification of pharmacogenomic predictors of treatment response could provide greater selectivity to treatment recommendations, as well as help prevent such serious adverse events as antidepressant-induced mania.

GRANTS

Development Award (private benefactor)

Co-Principal Investigators: Mark A. Frye, MD; Joanna M. Biernacka, PhD

Funding period: 12/2008 – 12/2011



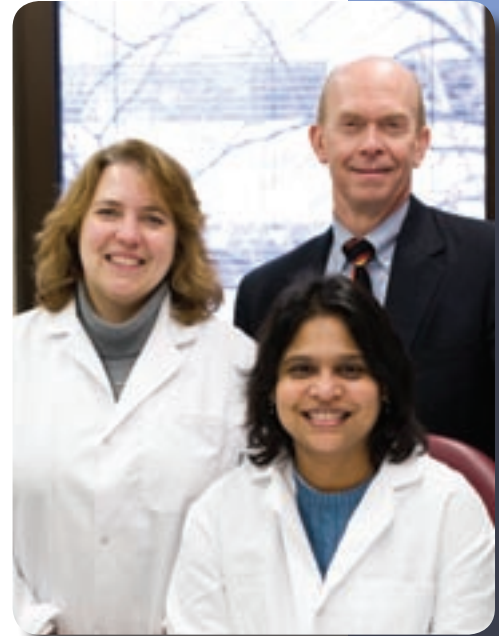
Front: Brernacka,
Weinshilboum, Mrazek,
Hall-Flavin
Back: Karen Snyder,
Michelle Skime,
Karen Chia, Kriste Lewis,
Astrid Hoberg

PSYCHOGENOMICS LABORATORY

Investigators

John Logan Black III, MD and David Mrazek, MD, FRC Psych

The core effort of the Psychogenomics Laboratory is to analyze genes for mutations, polymorphisms, and gene expression with the goal of characterizing genomic determinants of drug treatment responsiveness in psychiatric and cancer patients. Our lab has a particular focus on the cytochrome P450 enzymes, but we have also studied drug response associated with variability in the serotonin transporter, dopamine D3 and D4 receptor, and serotonin receptor 2A. An important aspect of this research has been our involvement in the development of new clinical genetic tests that are now available through the Mayo Medical Laboratories. Finally, this laboratory functions as a "classroom" for trainees and faculty in psychiatry and psychology who are interested in learning how to do bench top research. Several of these individuals have gone on to develop their own research careers in the area of psychiatric genetics.



Back: Black
Middle: Denise Walker,
Front: Raji Avula

GRANTS

CR Award; CYP2D6: A Clinical Challenge and Model for Genomic Copy Number Variation. Funding period: 06/2008 – 05/2010; PI: Black

CR20 Award by the Center for Translational Research Activities; Search for Cytochrome P450 2D6 Gene Instability in Cell Cultures, Somatic Cells, and Human Pedigrees. Funding Period: 09/2008 – 09/2010; PI: Black

Mayo Clinic Cancer Center; Effect of CYP2C19*17 Genotype on Breast Cancer Response to Tamoxifen. Funding period: 07/2008 – 6/2009; PI: Goetz

Mayo Clinic Department of Laboratory Medicine and Pathology; Effect of CYP2B6 Genotype on Outcomes in Patients Receiving Cyclophosphamide Before Bone Marrow Transplantation. Funding period: 03/2008 – 02/2010; PI: Black

Department of Psychiatry and Psychology; Correlation of CYP2C19*17 genotype and treatment response in STAR*D samples. Funding period: 03/2008 – 02/2010; PI: Mrazek

KEY PUBLICATIONS

Rasmussen KG, Black JL. Serotonin transporter gene status and ECT outcomes. *J Clin Psychiatry* 2009; 70(1):92-94

Overeem S, Black JL 3rd, Lammers GJ. Narcolepsy: Immunological aspects. *Sleep Med Rev* 2008; 12(2):95-107

McAlpine DE, O'Kane DJ, Black JL, Mrazek DA. Cytochrome P450 2D6 genotype variation and venlafaxine dosage. *Mayo Clin Proc* 2007; 82(9):1065-1068

Black JL 3rd, O'Kane DJ, Mrazek DA. The impact of CYP allelic variation on antidepressant metabolism: A review. *Expert Opin Drug Metab Toxicol* 2007; 3(1):21-31



SHAWNA L. EHLERS, PhD

Shawna L. Ehlers, PhD, focuses on psychological and behavioral factors affecting medical conditions, such as cancer and transplant outcomes. Her overarching career objective is to aid the integration of behavioral medicine into transplant medicine from an evidence-based perspective. Her career development research is to investigate behavioral factors of transplant outcomes such as the impact of tobacco on patient immune recovery, infection rates, hospitalization days, and overall survival.

Clinical Research Mentors

Christi Patten, PhD, Dennis Gastineau, MD and Jim Cerhan, MD, PhD

GRANTS

National Institute of Health - National Center for Research Resources KL2; The role of health behaviors in hematopoietic stem cell transplantation. Funding period: 07/2008 – 06/2013; PI: Ehlers

Small Grant Program; Mayo Clinic Department of Psychiatry and Psychology; The role of tobacco in hematopoietic cell transplantation outcomes for leukemia survivors. Funding period: 04/2007 – 04/2009; PI: Ehlers

Fraternal Order of the Eagles Cancer Research Fund - Career Development; The role of health behaviors in hematopoietic stem cell transplantation. supplement award to NIH/NCRR 1KL2 RR024151. Funding period: 2009 – 2011; PI: Ehlers

KEY PUBLICATIONS

Ehlers SL. Ethical analysis and consideration of health behaviors in organ allocation: Focus on tobacco. *Transplant Rev* 2008; 22(3):171-177 (Special Issue on Transplantation Ethics)

Hoth KF, Christensen AJ, Ehlers SL, Raichle KA, Lawton WJ. A longitudinal examination of social support, agreeableness and depressive symptoms in chronic kidney disease. *J Behav Med* 2007; 30(1):69-76

Ehlers SL, Rodrigue JR, Patton PR, Lloyd-Turner J, Kaplan B, Howard RJ. Treating tobacco use and dependence in renal transplant patients: Development and implementation of a program. *Prog Transplant* 2006; 16:33-37



S. SOLAY UNAL, MD

In her career development research study, Dr Unal and her colleagues are utilizing novel brain methodology and potential peripheral biomarkers to study pediatric bipolar disorder, before and after 12-week, randomized, placebo-controlled trial of adjunctive omega 3-fatty acids. The goal of this translational study is to better understand the neurobiology of pediatric presentations of bipolar disorder and identify clinical correlates of treatment response.

Clinical Research Mentors

Elliott Richelson MD, PhD and Joel Felmlee PhD

GRANTS

National Institute of Mental Health/KL2; Proton and Phosphorus Magnetic Resonance Spectroscopic Correlates of Omega-3 Fatty Acid Treatment in Early-Onset Pediatric Bipolar Disorder. Funding period: 2007-2011; PI: Unal

Proton Magnetic Resonance Spectroscopic Correlates of Omega-3 Fatty Acid Treatment in Early-Onset Bipolar Disorder; National Institute Health and Mayo Clinic Career development Supplement Award. Funding period: 2007-2010; PI: Unal

RECENT PUBLICATIONS

Port JD, Unal SS, Mrazek DA, Marcus SM. Metabolic alterations in medication-free patients with bipolar disorder: A 3T CSF-corrected magnetic resonance spectroscopic imaging study. *Psychiatry Research: Neuroimaging*, 2008, 162: 113 – 121.

AWARDS

National Institute of Mental Health Pediatric Bipolar Disorder Conference "Excellence in research" Award Bethesda, 2007

JOHN E. SCHMIDT, PhD

John E. Schmidt, PhD, focuses his research on the study of central and peripheral mechanisms by which behavioral change through self-regulatory training techniques leads to improvements in pain severity and long-term health in chronic pain patients. His current research is investigating specific psychological and physiological characteristics and mechanisms associated with autonomic change in chronic pain patients during laboratory stressors and after training in self-regulatory interventions. Dr Schmidt's overall career objective is to develop evidence-based interventions for patients with chronic medical conditions designed to enhance self-regulation and behavioral change, leading to long-term improvements in symptoms, overall health, and quality of life.

Clinical Research Mentors

Michael Joyner, MD, Christi Patten, PhD, W. Michael Hooten, MD, Charles R. Carlson, PhD, and Leslie J. Crofford, MD



GRANTS

National Institutes of Health / Mayo Clinic KL2; A Controlled Comparison of Self-Regulation in Orofacial Pain and Fibromyalgia. Funding period: 8/2008 – 7/2011; PI: Schmidt

Saint Mary's Sponsorship Board; Religious Importance, Spiritual Coping, and Treatment Outcomes in Chronic Pain Patients. Funding period: 7/2007; PI: Schmidt

Mayo Clinic Departmental Small Grants Award; Emotional and Physiological Self-regulation in Chronic Pain. Funding period: 11/2006; PI: Schmidt

National Institute of Dental & Craniofacial Research (F32 De017834-01); Self-Regulation in Orofacial Pain and Fibromyalgia. Funding period: 2006–2008; PI: Schmidt

KEY PUBLICATIONS

Schmidt JE, Carlson CR. A controlled comparison of emotional reactivity and physiological response in chronic orofacial pain patients. *J Orofac Pain* 2009, in press

Crisostomo RA, Schmidt JE, Hooten WM, Kerkvliet JL, Townsend CO, Bruce BK. Withdrawal of analgesic medication for chronic low-back pain patients: Improvement in outcomes of multidisciplinary rehabilitation regardless of surgical history. *Am J Phys Med Rehabil* 2008; 87:527-536

Turner MK, Hooten WM, Schmidt JE, Kerkvliet JL, Townsend CO, Bruce BK. Prevalence and clinical correlates of vitamin D inadequacy among patients with chronic pain. *Pain Med* 2008; 9(8):979-984

Harper FWK, Schmidt JE, Beacham AO, Salsman JM, Averill AJ, Graves KD, Andrykowski MA. The role of social cognitive processing theory and optimism in positive psychosocial and physical behavior change after cancer diagnosis and treatment. *Psycho-oncology* 2007; 16:79

AWARDS/LEADERSHIP

2008 Howard P. Rome Grand Rounds Award, Mayo Clinic



R. ROBERT AUGER, MD

Dr R. Robert Auger's interest in clinical research is facilitated by his unique clinical exposure to adolescents, many of whom suffer from delayed sleep phase disorder (DSPD). Dr Auger was awarded a CR20 in 2007, which funds an ongoing case-control study that explores light exposure patterns among afflicted adolescents with this condition. A future goal is to dedicate a substantial portion of his practice to investigating a variety of untapped areas relating to the treatment, pathophysiology, and psychiatric comorbidity of DSPD and other circadian rhythm sleep disorders.

Clinical Research Mentor

Helen J. Burgess, PhD, Rush University Medical Center

GRANTS

Mayo Clinic Clinical Research Award (CR 20); Delayed Sleep Phase Disorder and Association with Evening Light Exposure: A Pilot Study. Funding period: 11/2007 - 10/2009; PI: Auger

KEY PUBLICATIONS

Temam PT, Tippmann-Peikert M, Silber MH, Slocumb NL, Auger RR. Idiopathic rapid-eye-movement sleep disorder: Associations with antidepressants, psychiatric diagnoses, and other factors in relation to age of onset. *Sleep Med*, 2009; 10:60-65

Auger RR, Morgenthaler TI. Jet lag and other sleep disorders relevant to the traveler. *Travel Med Infect Dis* 2009; 7:60-68

Auger RR. Sleep and neurodegenerative disorders: A review. *Minerva Psichiatr* 2008; 49:267-295.



THOMAS BERGQUIST, PhD, LP

The Telerehabilitation Study continues research originally supported by the National Institute on Disability and Rehabilitation Research (NIDRR) funded Mayo TBI (Traumatic Brain Injury) Model System. Initial research demonstrated that with appropriate training and technology, individuals with profound memory impairments after brain injury are able to effectively use distance communication to receive rehabilitation. Subsequent studies have demonstrated the effectiveness of telerehabilitation at helping individuals improve their level of functioning and develop strategies to help them compensate for cognitive impairments. Current research involves a crossover randomized control design in which an active telerehabilitation condition is compared with a waiting-list control. Success from this research has led to a commitment to advocate for the use of this technology to enable persons unable to directly access specialized rehabilitation services due to personal circumstances or geographic isolation.

GRANTS

Mayo Clinic Clinical Research Award (CR 20); Telehealth with Acquired Brain Injury. Funding period: 07/2008 - 06/2010 ; PI: Bergquist

KEY PUBLICATIONS

Bergquist T, Gehl C, Lepore S, Holzworth N, Beaulieu W. Internet-based cognitive rehabilitation in individuals with acquired brain injury: A pilot feasibility study. *Brain Inj* 2008; 22(11):891-897

Bergquist TF, Gehl C. Mild traumatic brain injury: Continued investigation and controversy (Review of the book Mild traumatic brain injury and postconcussion syndrome: The new evidence for diagnosis and treatment). *J Clin Exp Neuropsychol* 2008; 30(7):850-852

CHRISTOPHER L. SOLA, DO

Christopher L. Sola, DO, is primarily interested in improving the delivery of clinical treatment options and clarifying our understanding of the interplay between psychiatric symptoms and “organic” issues. Dr Sola was awarded a CR20 grant to examine the psychoendocrinological question of whether electroconvulsive antidepressant response can be accelerated with triiodothyronine. In pursuit of this project, several other interesting questions have arisen, some regarding the economics of health-care delivery, others involving issues surrounding informed consent, and still others regarding the psychogenomic aspects of how polymorphisms in thyroid deiodinases may allow us to predict who will best benefit from the use of triiodothyronine. Dr Sola’s aspiration is that these lines of research will translate to real changes in the delivery of care and will eventually exert a benefit in the efficiency of the treatment of depression.



Clinical Research Mentors

Teresa Rummans, MD and Mark A. Frye, MD

GRANTS

Mayo Clinic Clinical Research Award (CR 20); Acceleration and Relapse Prevention with Triiodothyronine as an Adjunct to ECT. Funding period: 01/2008 – 01/2010; PI: Sola

Richard F. Emslander Career Development Award

Deiodonase I/II Functional Polymorphisms and Treatment Response in Patients with Major Depression who Receive Triiodothyronine as an Adjunct to ECT. Funding period: 02/2009 – 02/2012; PI: Sola

KEY PUBLICATIONS

Chopra A, Sola CL. A case of prolonged interictal ECT-induced delirium. J Neuropsychiatry Clin Neurosci 2009, in press

Brownlowe K, Sola C. Clozapine toxicity in smoking cessation and with ciprofloxacin. Psychosomatics 2008; 49(2):176

Bostwick JM, Sola CL. An updated review of implantable cardioverter/defibrillators, induced anxiety, and quality of life. Psychiatr Clin North Am 2007; 30(4):677-688



OTTO PEDRAZA, PhD

Otto Pedraza, PhD, is a clinical neuropsychologist interested in the cognitive neuroscience of memory, the development and validation of psychometric tests, and the study of disparities in the prevalence and incidence of mild cognitive impairment (MCI) and dementia among ethnic/racial minorities. In 2006, he was awarded a career development grant (K-01) from NIH/NINDS to conduct a population-based study of MCI heterogeneity among African American adults in Jacksonville, Florida. Data collection for that project is currently in progress. The overarching goal of that project is to shed light on the medical, genetic, and psychosocial factors associated with the higher prevalence of MCI and dementia in African American adults. He also has been pursuing training and didactic opportunities in advanced psychometrics and fMRI data acquisition and analysis.

Clinical Research Mentors

Neill R. Graff-Radford, MD, and Glenn E. Smith, PhD

KEY PUBLICATIONS

Crane PK, Narasimhalu K, Gibbons LE, Pedraza O, Mehta KM, Tang Y, Manly JJ, Reed BR, Mungas DM. Composite scores for executive function items: Demographic heterogeneity and relationships with quantitative magnetic resonance imaging. *J Int Neuropsychol Soc* 2008; 14(5):746-759

Pedraza O, Mungas D. Measurement in cross-cultural neuropsychology. *Neuropsychol Rev* 2008; 18(3):184-193

Pedraza O, Dotson VM, Willis FB, Graff-Radford NR, Lucas JA. Internal consistency and test-retest stability of the Geriatric Depression Scale-Short Form in African American older adults. *J Psychopathol Behav Assess* 2009; in press

AWARDS

Diplomate, American Board of Clinical Neuropsychology

University of Florida 2009 Outstanding Young Alumnus Award

YONAS E. GEDA MD

The Harold Amos Medical Faculty Development Program is a Robert Wood Johnson Foundation award that recognizes research excellence and leadership in academic medicine. Dr Geda, his mentor Dr Ronald Petersen, and colleagues will use this award to conduct neuropsychiatric investigation of mild cognitive impairment (MCI) and pre-MCI in geographically and ethnically diverse populations in Minnesota, Florida and Arizona.

Clinical Research Mentor

Ronald C. Petersen, MD, PhD

GRANTS

National Institute of Mental Health/National Institutes of Health (K01 MH68351)
Mentored Research Scientist Development Award for New Minority Faculty
Title: Prevalence of neuropsychiatric symptoms in mild cognitive impairment.
Funding period: 01/2004 – 01/2009; PI: Geda

Robert Wood Johnson Foundation; Harold Amos Medical Faculty Development Award; Neuropsychiatric Symptoms in Mild Cognitive Impairment (MCI) & Pre MCI in Geographically and Ethnically Diverse Populations. Funding period: 01/2008 – 01/2012; PI: Geda

KEY PUBLICATIONS

Geda YE, Roberts RO, Knopman DS, Petersen RC, Christianson TJ, Pankratz VS, Smith GE, Boeve BF, Ivnik RJ, Tangalos EG, Rocca WA. Prevalence of neuropsychiatric symptoms in mild cognitive impairment and normal cognitive aging. A population-based study. Arch Gen Psychiatry 2008; 65:1193-1198

Roberts RO, Geda YE, Knopmand DS, Christianson TJ, Pankratz VS, Boeve BF, Vella A, Walter A. Rocca, Petersen, RC. Association of duration and severity of diabetes mellitus with mild cognitive impairment. Arch Nerol 2008. 65:1066-1073

Roberts RO, Geda YE, Knopman DS, Cha RH, Pankratz VS, Boeve BF, Ivnik RJ, Tangalos EG, Petersen RC, Rocca WA. The Mayo Clinic Study of Aging: design and sampling, participation, baseline measures and sample characteristics. Neuroepidemiology 2008; 30:58-69





Front: DeJesus, Nelson
Back: Angstman,
Williams

SCIENCE OF HEALTH CARE DELIVERY AND MODELS OF COLLABORATION WITH PRIMARY CARE

Investigators

Kristin S. Vickers Douglas, PhD, Mark D. Williams, MD, Kurt B. Angstman, MD, Ramona S. DeJesus, MD, Pamela J. Nelson, CNS, PhD, Gabrielle Melin, MD, James M. Naessens, ScD, Nilay D. Shah, PhD, and Robert Stroebel, MD

This clinical research group is exploring new methods of care that help practitioners look for ways to sustain positive improvements in health care delivery and optimal patient care. We are currently involved with an application of the DIAMOND depression model as designed by the Institute for Clinical Systems Improvement (ICSI). The goals are to translate a collaborative model to treat depression in primary care into two Mayo Clinic primary care locations and study aspects of that model aimed at understanding and improving outcomes. Over a two to three year period, we hope to demonstrate to what extent this model improves outcomes, returns patients to work, and saves money as compared to what is currently published and to use that information to help Mayo Clinic decide about effective spread.

GRANTS

Mayo Clinic Diamond Award
Care Management of Depression (CMOD).
Employee and Community Health and the
Department of Psychiatry and Psychology
Funding period: 2008 - 2009; PI: Williams

Mayo Clinic Quality Innovations Program Award
(QIPA); Practical and Reliable Measure of Patient
Self-Confidence in Primary Care.
Funding period: 2008 - 2009; PI: Stroebel

KEY PUBLICATIONS & PRESENTATIONS

DeJesus RS, Vickers KS, Melin GJ, Williams MD. A
system-based approach to depression management
in primary care using the Patient Health
Questionnaire-9. *Mayo Clin Proc* 2007; 82(11):1395-
1402

Vickers KS, Kircher KJ, Smith MD, Petersen LR,
Rasmussen NH. Health behavior counseling
in primary care: Provider-reported rate and
confidence. *Fam Med* 2007; 39:730-735

Williams MD, Shah N, Wagie A, Frye MA, Wood,
D. Specialty care costs in continuously enrolled
individuals with bipolar disorder are higher than
those with individuals with depression or diabetes.

Research abstract to be presented at the May 2009
Annual Meeting of the American Psychiatric
Association, San Francisco, CA

Williams MA. Translation of collaborative care
for depression into over 20 different healthcare
practices. Workshop with Wilkinson J. World
Psychiatric Association Annual Meeting, September
21, 2008, Prague, Czech Republic

Vickers KS, Kircher KJ, Hathaway JC, Olson BJ.
Home blood pressure monitoring and secure
emailing with primary care provider for patients
with hypertension. 2008 AAFP Annual Conference
on Practice Improvement, Savannah, Georgia

Angstman KB. Quality process for increased
utilization of PHQ-9. 20th Annual National Forum
on Quality Improvement in Health Care—Institute
for Healthcare Improvement. December 10, 2008,
Nashville, Tennessee

AWARDS / LEADERSHIP

Mark Williams, MD, Chair, Mayo Clinic Quality
Committee for the Department of Psychiatry and
Psychology

MOOD CLINIC AND MOOD DISORDER UNIT

Investigators

Simon Kung, MD, Renato D. Alarcón, MD, David Mrazek, MD, FRC Psych, Mark A. Frye, MD, Christopher L. Sola, MD, Mark D. Williams, MD, and Joel Winner MD

The main focus of the integrated mood program, the Mayo Mood Clinic and the Mood Disorders Inpatient Unit, is to conduct clinically relevant research in treatment resistant depression and bipolar disorder. Our current research projects aim to build on our comprehensive and multidisciplinary treatment program.



*Sola, Williams, Mrazek
and Kung*

GRANTS

Mayo Departmental Funds; Cytochrome P-450 2D6, 2C19, and 2C9, and Serotonin Receptor and Transporter Gene Profiles in Hospitalized Patients with Depression. Funding period: 12/2007 – 11/2009; PI: Kung

National Alliance for Research in Depression and Schizophrenia Independent Investigator Award. High Field Proton MRS of Anterior Cingulate in Bipolar vs Unipolar and Melancholic vs Atypical Depression. Funding period: 09/2006 – 03/2009; PI: Frye

Cooper Family Foundation Grant for the Study of the Genomics of Mood Disorders. Funding period: 04/2003 – 04/2008; PI: Mrazek

KEY PUBLICATIONS & PRESENTATIONS

Frye MA, Yatham L, Ketter TA, et al. Depressive relapse during lithium treatment associated with increased serum thyroid-stimulating hormone: results from two placebo-controlled bipolar I maintenance studies. *Acta Psychiatrica Scandinavica* 2009, Jan 23 [Epub ahead of print]

Mrazek DA, Rush AJ, Biernacka JM, O’Kane DJ, Cunningham JM, Wieben ED, Schaid DJ, Drews MS, Courson VL, Snyder KA, Black JL 3rd, Weinshilboum RM. SLC6A4 variation and citalopram response. *Am J Med Genet B Neuropsychiatr Genet* 2009; 1570B:341-351

Frye MA, Helleman G, McElroy SL, Altshuler LL, et al. Correlates of treatment-emergent mania associated with antidepressant treatment in bipolar depression. *Am J Psychiatry* 2009;166:164-72

Mrazek M, Koenig B, Skime M, Snyder K, Hook C, Black J 3rd, Mrazek DA. Assessing attitudes about genetic testing as a component of continuing medical education. *Acad Psychiatry* 2007; 31(6):447-451

Frye MA, Grunze H, Suppes T, McElroy SL, Keck PE Jr, Walden J, Leverich GS, Altshuler LL, et al. A placebo-controlled evaluation of adjunctive modafinil in the treatment of bipolar depression. *Am J Psychiatry* 2007; 164(8):1242-1249

Kung S, Winner JC, Drews M, Alarcon RD, Mrazek DA. Cytochrome P-450 2D6, 2C19, and Serotonin transporter genotyping for depressed inpatients at Mayo Clinic Mood Disorders Unit. Presented as part of the Symposium “Emerging clinical applications of genotype-guided psychotropics for depressive disorders” at the May 2009 Annual Meeting of the American Psychiatric Association, San Francisco, CA

Frye MA, Berk M, Benazzi F, Wang W, Tohen M. Olanzapine-Fluoxetine combination in the treatment of bipolar mixed depression: secondary exploratory outcomes of a double-blind placebo controlled trial. New research presented at the Annual Meeting of the American College of Neuropsychopharmacology, December 2008 Scottsdale. AZ

AWARDS/LEADERSHIP

Renato Alarcón MD, Chair, New Research Sub-committee, American Psychiatric Association Annual Meeting

Renato Alarcón MD, Co-Editor, *Archivos de Psiquiatría*, Madrid, Spain

Mark Frye MD, Vice President Global Outreach International Society of Bipolar Disorders



Bostwick and Lineberry

SUICIDE

Investigators

J. Michael Bostwick, MD and Timothy W. Lineberry, MD

The suicide research group focuses on improving suicide risk assessment and management through identifying risk factors and warning signs in high-risk clinical groups. Dr Bostwick is investigating whether abnormalities in the HPA stress axis can predict eventual suicide. He has also launched a project looking at suicide scripts in attempted suicide and whether they correlate with eventual death by suicide. In collaboration with David Jobes, PhD, at Catholic University, Dr Lineberry has validated the Suicide Status Form (SSF) to systematize the assessment of suicidal risk in inpatients and introduced it into routine clinical care in Mayo Clinic's psychiatric hospital. Present efforts explore whether SSF changes during hospitalization correlate with shifting suicide risk.

GRANTS

Mayo Clinic Clinical Research Award (CR20);
An Historical Cohort Study of the Dexamethasone
Suppression Test and Subsequent Suicide
Funding period: 07/2006 – 12/2008; PI: Bostwick

American Foundation for Suicide Prevention;
Resurrecting the dexamethasone suppression test: Does
an abnormal DST warn of elevated lifetime suicide risk?
An historical cohort study; Funding period: 09/2005 –
12/2008; PI: Bostwick

KEY PUBLICATIONS

Bostwick JM, Lineberry TW. Inpatient suicide:
Preventing a common sentinel event (editorial).
Gen Hosp Psychiatry 2009, in press

Bostwick JM, Cohen LM. Differentiating suicide from
life-ending acts in end-of-life decision: a model based
on chronic kidney disease and dialysis. Psychosomatics
2009; 50:1-7

Conrad AK, Jacoby AM, Jobes DA, Lineberry TW, Shea
CE, Arnold-Ewing TD, Schmid PJ, Ellenbecker SM, Lee
JL, Fritsche K, Grenell JA, Gehin JM, Kung S. A

psychometric investigation of the suicide status form II
with a psychiatric inpatient sample. Suicide Life Threat
Behav 2009, in press

Ballard ED, Pao M, Henderson D, Lee LM, Bostwick
JM, Rosenstein DL. Suicide in the medical setting. Jt
Com J Qual Patient Saf 2008; 34(8):474-481

Capasso RM, Lineberry TW, Bostwick JM, Decker PA, St
Sauver J. Mortality in schizophrenia and schizoaffective
disorder: An Olmsted County, Minnesota, cohort: 1950-
2005 Schizophr Res 2008; 98:287-294

AWARDS/LEADERSHIP

Dr Lineberry, secretary, American Association of
Suicidology

Dr Lineberry, subject matter expert on suicide prevention,
United State Army

Dr. Bostwick, President, American Foundation for
Suicide Prevention, Minnesota Chapter

ELLIOTT RICHELSON, MD

Dr Richelson's laboratory has focused research on pharmaceutical development for mood disorder treatments. Most recently, a licensing agreement for the triple re-uptake inhibitors, which are potential antidepressants, was finalized with Astra Zeneca. The agreement will include laboratory funding to continue structure-activity studies on other compounds that Dr Richelson and colleagues have designed. Currently, Phase 1 clinical testing is planned for early 2010 for the lead triple re-uptake inhibitor. Also in 2008, Dr Richelson's laboratory began a new line of research that has led to a novel hypothesis about the mechanism of action of mood stabilizers, namely, that mood stabilizers facilitate the transport of mitochondria to the synapse. Additionally, he was co-inventor on two issued international patents and co-inventor on several US and international patent applications



GRANTS

National Institutes of Health Supplement for R01-MH071241-03S1 NT69L; A Potential, Novel Antischizophrenic Drug. Funding period: 08/2008 - 03/2009; PI: Richelson

National Institute of Mental Health. R01 MH071241 NT69L: A potential, novel antischizophrenic drug. Funding period: 05/2006 - 03/2010; PI: Richelson

National Institute of Mental Health Supplement for R01 MH071241. Funding period: 08/2008 - 03/2009; PI: Richelson

National Institute of Mental Health. R01 MH 27692 Psychotropic Drugs and Receptor Sensitivity Changes in: Neurotensin Receptor as Target for New Neuroleptics. Funding period: 07/1993 - 06/1998; PI: Richelson

KEY PUBLICATIONS

Roussy G, Dansereau MA, Dore-Savard L, Belleville K, Beaudet N, Richelson E, Sarret P. Spinal NTS1 receptors regulate nociceptive signaling in a rat formalin tonic pain model. *J Neurochem* 2008 May; 105(4):1100-14. Epub 2007 Dec 25

Bouras EP, Talley NJ, Camilleri M, Burton DD, Heckman MG, Crook JE, Richelson E. Effects of amitriptyline on gastric sensorimotor function and postprandial symptoms in healthy individuals: a randomized, double-blind, placebo-controlled trial. *Am J Gastroenterol* 2008 Aug; 103(8):2043-50

Liang Y, Boules M, Shaw AM, Williams K, Fredrickson P, Richelson E. Effect of a novel neurotensin analog, NT69L, on nicotine-induced alterations in monoamine levels in rat brain. *Brain Res* 2008 Sep 22; 1231:6-15. Epub 2008 Jul 19

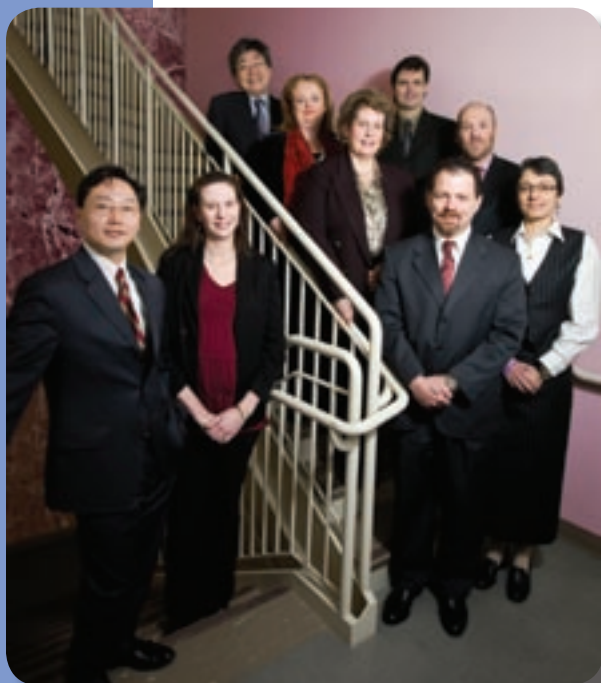
Corena-McLeod Mdel P, Oliveros A, Charlesworth C, Madden B, Liang YQ, Boules M, Shaw A, Williams K, Richelson E. Paliperidone as a mood stabilizer: a pre-frontal cortex synaptoneurosomal proteomics comparison with lithium and valproic acid after chronic treatment reveals similarities in protein expression. *Brain Res* 2008 Oct 3; 1233:8-19. Epub 2008 Jul 15

Willis FB, Isley AL, Geda YE, Quarles L 4th, Fredrickson PA. Resolution of syncope with treatment of sleep apnea. *J Am Board Fam Med* 2008; 5:466-8

Corena-McLeod M, Oliveros A, Charlesworth C, Madden B, Liang YQ, Boules M, Shaw A, Williams K, Richelson E. Paliperidone as a mood stabilizer: A pre-frontal cortex synaptoneurosomal proteomics comparison with lithium and valproic acid after chronic treatment reveals similarities in protein expression. *Brain Res* 2008; 1233:8-19

Liang Y, Shaw AM, Boules M, Briody S, Robinson J, Oliveros A, Blazar E, Williams K, Zhang Y, Carlier PR, Richelson E. Antidepressant-like pharmacological profile of a novel triple reuptake inhibitor, (1S,2S)-3-(methyldamono)-2-(naphthalen-2-yl)-1-phenylpropan-1-ol (PRC200-SS). *J Pharmacol Exp Ther* 2008; 327:573-583

NEUROMODULATION TREATMENT INTERVENTION



1st Row: Lee, Tye, Smith, Sandroni
2nd Row: Adams, Frye
3rd Row: Sampson, Stead
4th Row: Matsumoto

DEEP BRAIN STIMULATION

Investigators

Mark A. Frye, MD, Shirlene Sampson, MD, Glenn A. Smith, PhD, Kendall H. Lee, MD, PhD, Joseph V. Matsumoto, MD, Paula Sandroni, MD, Andrea C. Adams, MD, Squire M. (Matt) Stead, MD, PhD, and Susannah Tye, PhD

Functional neuromodulation such as deep brain stimulation (DBS) offers immense opportunity for surgical treatment of refractory psychiatric disorders. Several therapeutic trials have been conducted to investigate the effectiveness of DBS in the treatment of refractory depression, obsessive compulsive disorder, and Tourette's syndrome. This highly collaborative clinical research group is focusing their efforts on identifying potential mechanisms of action (i.e. neural circuitry, neurotransmission, synaptic plasticity) of DBS given its broad neuropsychiatric potential and neuropsychologic and psychiatric clinical outcomes in Parkinson's disease patients implanted with DBS.

GRANTS

National Alliance for Research in Schizophrenia and Depression (NARSAD) Young Investigator Program; Mechanism of Action of Deep Brain Stimulation in Neuropsychiatric Conditions: Neural Circuitry, Neurotransmission and Synaptic Plasticity. Funding period: 07/2009 - 06/2011; PI: Tye (mentors Kendall Lee and Helen Mayberg)

Mayo Clinic Clinical Research Award (CR20)

Deep Brain Stimulation and Mood in Parkinson's Disease: A Prospective Follow-up Study. Funding period: 07/2008 - 06/2010; PI: Frye and Smith

National Institutes of Health. (K08 NS 52232); Mechanism of Action of Deep Brain Stimulation. Funding period: 07/2008 - 06/2013; PI: Lee

KEY PUBLICATIONS

Tye SJ, Frye MA, Lee KH. Disrupting disordered neurocircuitry: Treating refractory psychiatric illness with neuromodulation. Mayo Clinic Proc 2009, in press

Van Gompel JJ, Stead SM, Giannini C, Meyer FB, Marsh WR, Fountain T, So E, Cohen-Gadol A, Lee KH, Worrell GA. Phase I trial: Safety and feasibility of intracranial electroencephalography using hybrid subdural electrodes containing macro- and microelectrode arrays. Neurosurg Focus 2008; 25(3):E23

Lee KH, Kristic K, van Hoff R, Hitti FL, Blaha C, Harris B, Roberts DW, Leiter JC. High-frequency stimulation of the subthalamic nucleus increases glutamate in the subthalamic nucleus of rats as demonstrated by in vivo enzyme-linked glutamate sensor. Brain Res 2007; 1162:121-129

ELECTROCONVULSIVE THERAPY

Investigators

Keith Rasmussen, MD, Christopher Sola, DO, Maria Lapid, MD, Simon Kung, MD, Donald McAlpine, MD, and Shirlene Sampson, MD

The ECT research group at Mayo Clinic in Minnesota has been active in performing large multicenter randomized controlled trials funded by NIMH for over ten years. As a member of the Consortium for Research in ECT (CORE), our research goal is to better understand how to maintain remission of depression after a successful acute series of ECT.

GRANTS

National Institute of Mental Health Collaborative RO1; Prolonging Remission in Depressed Elderly (PRIDE). Funding period: 07/2009 – 06/2011; Mayo site PI: Sampson

Mayo Clinical Research Award (CR20) Acceleration and Relapse Prevention with Triiodothyronine as an Adjunct to Electroconvulsive Therapy. Funding period: 01/2008 - 12/2009; PI: Sola

Richard F. Emslander Career Development Award Deiodonase I/II Functional Polymorphisms and Treatment Response in Patients with Major Depression who Receive Triiodothyronine (T3) as an Adjunct to Electroconvulsive Therapy. Funding Period: 02/2009 – 02/2012 ; PI: Sola

KEY PUBLICATIONS

Rasmussen KG, Black JL. Serotonin transporter gene status and electroconvulsive therapy outcomes: A retrospective analysis of 83 patients. *J Clin Psychiatry* 2009; 70:92-94.

Rasmussen KG. Sham electroconvulsive therapy studies in depressive illness: A review of the literature and consideration of the placebo phenomenon in electroconvulsive therapy practice. *J ECT* 2009; 25:54-59.

Rasmussen KG, Mueller M, Rummans TA, Husain MM, Petrides G, Knapp RG, Fink M, Sampson SM, Bailine SH, Kellner CH. Is baseline medication resistance associated with potential for relapse after successful remission of a depressive episode with ECT? Data from the Consortium for Research on Electroconvulsive Therapy (CORE). *J Clin Psychiatry* 2009; 70(2):232-237

Lisanby SH, Sampson S, Husain MM, Petrides G, Knapp RG, McCall V, Young RC, Prudic J, Kellner CH. Toward individualized post-electroconvulsive therapy care: Piloting the Symptom-Titrated Algorithm-Based Longitudinal ECT (STABLE) Intervention. *J ECT* 2008; 24:179-182

Husain MM, McClintock SM, Rush AJ, Knapp RG, Fink M, Rummans TA, Rasmussen K, Claassen C, Petrides G, Biggs MM, Mueller M, Sampson S, Bailine SH, Lisanby SH, Kellner CH. The efficacy of acute electroconvulsive therapy in atypical depression. *J Clin Psychiatry* 2008; 69(3):406-411

Williams MD, Rummans T, Sampson S, Knapp R, Mueller M, Husain MM, Fink M, Rasmussen KG, O'Connor K, Smith G, Petrides G, Kellner CH. Outcomes of electroconvulsive therapy by race in the Consortium for Research on Electroconvulsive Therapy multisite study. *J ECT* 2008; 24(2):117-121

AWARDS / LEADERSHIP

Dr Shirlene Sampson, President, Association for Convulsive Therapy (ACT) 2008-2010

NEUROMODULATION TREATMENT INTERVENTION

TRANSCRANIAL MAGNETIC STIMULATION

Investigators

Shirlene M. Sampson, MD, MS, Simon Kung, MD, Donald McAlpine, MD, and Christopher Wall, MD

Transcranial magnetic stimulation (TMS) is a novel, non-invasive brain stimulation that is effective in treating depression. Our TMS research group laboratory was involved in the multi-center trial that led to the FDA approval for clinical use of TMS in treating depression. We are now involved in research using TMS in additional areas such as adolescent treatment resistant depression, fibromyalgia, neuropathic pain, and chronic headaches.



Front: Kung and Sampson
Back: Wall and McAlpine

GRANTS

American Academy of Child & Adolescent Psychiatry Pilot Research Award
An Evaluation of Safety and Feasibility using rTMS in Adolescents with Depression.
Funding period: 1/2007 – 1/2009; PI: Wall

Mayo Department of Psychiatry and Psychology Small Grants Award
An Evaluation of Safety and Feasibility using rTMS in Adolescents with Depression.
Funding period: 6/2007 – 6/2009; PI: Wall

KEY PUBLICATIONS AND PRESENTATIONS

Janicak PG, O'Reardon JP, Sampson SM, Husain MM, Lisanby SH, Rado JT, Heart KL, Demitrack MA. Transcranial magnetic stimulation in the treatment of major depressive disorder: A comprehensive summary of safety experience from acute exposure, extended exposure, and during reintroduction treatment. *J Clin Psychiatry* 2008; 69(2):222-232

O'Reardon JP, Solvason HB, Janicak PG, Sampson S, Isenberg KE, Nahas Z, McDonald WM, Avery D, Fitzgerald PB, Loo C, Demitrack MA, George MS, Sackeim HA. Efficacy and safety of transcranial magnetic stimulation in the acute treatment of major depression: a multisite randomized controlled trial. *Biol Psychiatry* 2007; 62(11):1208-1216.

Sampson SM, Solvason HB, Husain MM. Envisioning transcranial magnetic stimulation (TMS) as a clinical treatment option for depression. *Psychiatric Annals* 2007; 36(3):189-196

Wall CA, Croarkin PE, Husain MM, Janicak PG, Kraus LJ, Sampson SM. An evaluation of safety and feasibility using rTMS in adolescents with depression. American Academy of Child and Adolescent Psychiatry 55th Annual Meeting. Poster #6.12. Chicago, IL. November 1, 2008

Sampson SM, Kung SP, McAlpine DE, and Sandroni P. Slow-Frequency prefrontal rTMS for refractory neuropathic pain. Society of Biological Psychiatry Annual Meeting, Washington, D.C. May 2008

PSYCHIATRIC IMAGING

Investigators

John D. Port MD, PhD, Heidi A. Ward PhD,
Joel P. Felmlee PhD, Val Lowe MD, S. Solay Unal MD,
Steven P. Whiteside, PhD, Mark A. Frye MD,
David Mrazek MD, FRC Psych

The primary aim of the multidisciplinary Psychiatric Imaging Research Group is to develop and use imaging techniques to diagnose and guide treatment in psychiatric disease. For the past several years, the team focused primarily on the technique of MR spectroscopy. Recently, the team has turned to the field of multinuclear imaging of phosphorus and lithium, and PET imaging.



*Mandie Maroney-Smith,
Whiteside, Port, Frye, and
Mrazek*

GRANTS

National Alliance for Research in Schizophrenia and Depression (NARSAD) Young Investigator Program; Lithium Magnetic Resonance Brain Imaging for Bipolar Disorder. Funding period is 07/2009 – 06/2011; PI: Edmonson (mentors Mark Frye, MD, and Clifford Jack, MD)

Minnesota Partnership for Biotechnology and Medical Genomics Grants; Advanced Molecular Neuroimaging Infrastructure Grant for Programatic Study of Neuroscience Themes. Funding period: 2009 – 2012; PI: Unal and Lowe

NIH KL2; Proton Magnetic Resonance Spectroscopic Correlates of Omega-3 Fatty Acid Treatment in Early-Onset Bipolar Disorder. Funding period: 2007 – 2011; PI: Unal

Mayo Small Grants Program; Development of Lithium Imaging on a 3T MRI System. Funding period: 2007 – 2011; PI: Port

The Obsessive Compulsive Foundation; The Neurochemical Effects of Cognitive Behavioral Treatment in Pediatric OCD. Funding period: 2005 – 2009; PI: Whiteside

National Alliance for Research in Depression and Schizophrenia (NARSAD) Independent Investigator Award; High Field Proton MRS of Anterior Cingulate in Bipolar vs Unipolar and Melancholic vs Atypical Depression. Funding period 09/2006 – 03/2009; PI: Frye

KEY PUBLICATIONS & PRESENTATIONS

Unal SS, Port JD, Wells LA, Marcus SM.

Neurometabolic and neurocognitive effects of long-term fluoxetine treatment in depressed offspring's of bipolar parents: A multiple voxel proton magnetic resonance spectroscopy study. *J Am Acad Child Adolesc Psychiatry* 2009, in press

Port JD, Unal SS, Mrazek DA, Marcus SM. Metabolic alterations in medication-free patients with bipolar disorder: A 3T CSF-corrected magnetic resonance spectroscopic imaging study. *Psychiatry Res* 2008; 162(2):113-121

Frye MA, Watzl J, Banakar S, O'Neill J, Mintz J, Davanzo P, Fischer J, Chirichigno JW, Ventura J, Elman S, Tsuang J, Walot I, Thomas MA. Increased anterior cingulate/medial prefrontal cortical glutamate and creatine in bipolar depression. *Neuropsychopharmacology* 2007; 32(12):2490-2499

Frye MA, Thomas MA, Yue K, Binesh N, Davanzo P, Ventura J, O'Neill J, Guze B, Curran JG, Mintz J. Reduced concentrations of N-acetylaspartate (NAA) and the NAA-creatine ratio in the basal ganglia in bipolar disorder: A study using 3-Tesla proton magnetic resonance spectroscopy. *Psychiatry Res* 2007; 154(3):259-265

Blenman RA, Port JD, Felmlee JP. Selective maximization of (31)P MR spectroscopic signals of in vivo human brain metabolites at 3T. *J Magn Reson Imaging* 2007; 25(3):628-634

Frye MA, Port JD, Chia K, Kung S, Stevens SR, Maroney-Smith M, Alarcon RD, Mrazek DM. Increased 1-H MRS glutamate in depressed patients versus controls. New Research Abstract to be presented at the Annual Meeting of the Society of Biological Psychiatry, Vancouver May 2009

Port JD. The future role of MR in the diagnosis and management of psychiatric diseases. Presented at the MR Spectroscopy and Neurotransmitter Function in Neuropsychiatric Disorders: Focus on Glutamate and GABA ISMRM Workshop, Quebec City, Canada, 2008



Front: Julie Dammann and Whiteside
Back: Michael Tiede, Moore

ANXIETY DISORDERS

Investigators

Stephen P Whiteside, PhD, Mark W Olsen, MD, and Katherine M. Moore, MD

This multidisciplinary research team is involved in several clinical projects and two funded studies using magnetic resonance spectroscopy to assess the neural effects of cognitive behavioral therapy (CBT) for obsessive compulsive disorder (OCD) in children and adults. Our team is also involved in several clinical outcome projects evaluating the relative effectiveness of different components of CBT; developing intensive treatments for pediatric OCD, and developing new assessment measures for anxiety and related symptoms. The adult arm of the group is working to develop a clinical, teaching, and research program. Through our clinical work and investigations we hope to improve the treatment of children and adults with anxiety disorders including OCD.

GRANTS

Obsessive-Compulsive Foundation; The Neurochemical Effects of Cognitive Behavioral Treatment in Pediatric OCD. Funding period: 2005 – 2009; PI: Whiteside

The Effects of Cognitive Behavioral Treatment on Neurochemical Compounds in Patients with OCD
Evaluation of Proton Magnetic Resonance Spectroscopy: Project Extension. Funding period: 2007–2009; PI: Whiteside

KEY PUBLICATIONS

Whiteside SP. Adapting the Sheehan Disability Scale to assess child and parent impairment related to childhood anxiety disorders. J Clin Child Adolesc Psychol, 2009, in press

Whiteside SP, Brown AM. Exploring the utility of the Spence Children's Anxiety Scales parent- and child-report forms in a North American sample. J Anxiety Disord 2008; 22:1440-1446

Brown AM, Whiteside SP. Relations among perceived parental rearing behaviors, attachment style, and worry in anxious children. J Anxiety Disord 2008; 22:263-272

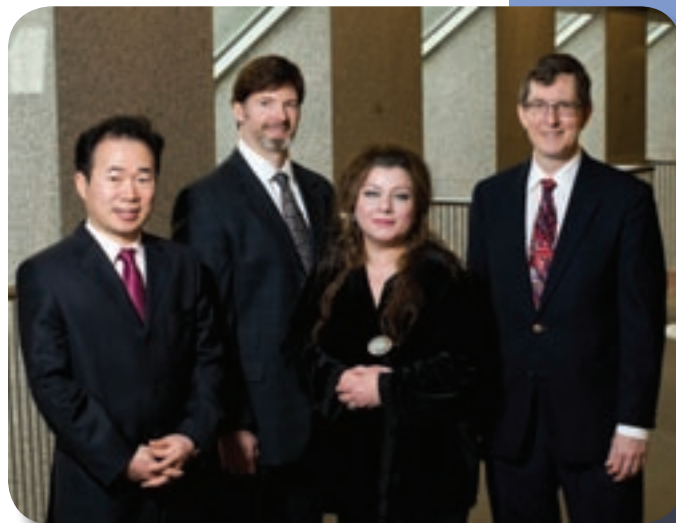
Whiteside SP, Brown AM, Abramowitz JS. Five day intensive treatment for adolescent OCD: A case series. J Anxiety Disord 2008; 22:495-504

Frye MA, Moore KM. Gabapentin and pregabalin. In: Schatzberg AB, Nemeroff CB eds. The American Psychiatric Publishing Textbook of Psychopharmacology, 4th edition. Arlington: American Psychiatric Publishing, Inc., 2008

PEDIATRIC MOOD DISORDERS

S. Solay Unal, MD, Elliott Richelson, MD,
John D. Port, MD, PhD, Joel Felmlee, PhD,
Val Lowe, MD, Doo-Sup Choi, PhD, and
Nina Kraguljac, MD

This group is currently investigating potential new treatment options for pediatric bipolar disorder. We have conducted several longitudinal studies to identify the biological markers of disease progression and treatment response in pediatric mood disorders. We are currently participating in a FDA registrational study of lamotrigine in children and adolescents with bipolar disorder. A second clinical study is a novel weight management program for bipolar youth who have gained significant weight from their medications. We also are launching a study utilizing PET imaging to examine the alterations in receptor biology with a novel drug candidate. This multidisciplinary research team including investigators from radiology, nuclear medicine, molecular pharmacology and experimental therapeutics is building a strong foundation for biomarker and drug development research at Mayo Clinic.



Choi, Lowe, Unal and Port

GRANTS

The Minnesota Partnership for Biotechnology and Medical Genomics.; Advanced Molecular Neuroimaging Infrastructure Grant. Funding Period: 2009 – 2012; PIs: Unal, Lowe

Glaxo Smith Kline

A 12 -week double- blind placebo controlled trial of Lamotrigine in children and adolescents with bipolar disorder. Funding Period: 2008 – 2011; PI: Unal

Mayo Clinic CTSA; Antidepressant induced Neurometabolic changes in adolescents with MDD before and after 12-week open label trial with Fluoxetine. Funding period: 2008 – 2010; PI: Unal

Mayo Clinic CTSA; Non medication management of psychotropic induced weight gain and metabolic syndrome in children with bipolar disorder. Funding period: 2009 – 2011; PI: Unal

KEY PUBLICATIONS

Unal S, Gracious B, Marcus SM., A 12 week open-label trial of EPA in children and adolescents with bipolar disorder. *Journal of Child and Adolescent Psychopharmacology* 2009, in press

Port JD, Unal SS, Mrazek DA, Marcus SM, Metabolic alterations in medication-free patients with bipolar disorder: A 3T CSF-corrected magnetic resonance spectroscopic imaging study. *Psychiatry Research: Neuroimaging*, 2008, 162: 113 – 121



Front: Hooten
Back: Townsend and Bruce

PAIN REHABILITATION

Investigators

W. Michael Hooten, MD, Barbara K. Bruce, PhD, and Cynthia O. Townsend, PhD

The Pain Rehabilitation Center's continued research infrastructure development has facilitated the ongoing assessment of clinical outcomes. These efforts resulted in the publication of our 6-month longitudinal treatment outcomes. Further secondary analyses are underway to identify long-term predictors of opioid resumption, recurrence of depressive symptoms and sustained reductions in pain severity. Our outcomes research efforts also have facilitated investigations related to the effects of smoking on treatment outcomes and identification of the clinical correlates of vitamin D inadequacy among patients with chronic pain. The research infrastructure has provided the opportunity to investigate the physiologic correlates of pain severity using methods to assess heat pain response and measures of muscle strength. Finally, an interdisciplinary effort led by the Department of Psychiatry and Psychology, which includes investigators from anesthesiology, neurology and radiology, has resulted in a genomics program for chronic pain.

GRANTS

Mayo Clinic Clinical Research Award (CR20)
Randomized trial of strength training vs. aerobic conditioning in patients with fibromyalgia. Funding period: 12/2006–12/2008; PI: Hooten

Foundation for Anesthesia Education and Research
Temporal Changes in Pain Threshold following Opioid Tapering. Funding period: 07/2007 – 7/2009; PI: Hooten

KEY PUBLICATIONS

Hooten WM, Townsend CO, Bruce BK, Warner DO. The effects of smoking status on opioid tapering among patients with chronic pain. *Anesth Analg* 2009; 108(1):308-315

Townsend CO, Kerkvliet JL, Bruce BK, Rome JD, Hooten WM, Luedtke CA, Hodgson JE. A longitudinal study of the efficacy of a comprehensive pain rehabilitation program with opioid withdrawal: Comparison of treatment outcomes based on opioid use status at admission. *Pain* 2008; 140:177-189

Hooten WM, Townsend CO, Bruce BK, Schmidt JE, Kerkvliet JL, Patten CA, Warner DO. Effects of smoking status on immediate treatment outcomes of multidisciplinary pain rehabilitation. *Pain Med* 2008; August 18 [Epub ahead of print]

Crisostomo RA, Schmidt JE, Hooten WM, Kerkvliet JL, Townsend CO, Bruce BK. Withdrawal of an analgesic medication for chronic low-back pain patients: Improvements in outcomes of multidisciplinary rehabilitation regardless of surgical history. *Am J Phys Med Rehabil* 2008; 87(7):527-536

Turner MK, Hooten WM, Schmidt JE, Kerkvliet JL, Townsend CO, Bruce BK. Prevalence and clinical correlates of vitamin D inadequacy among patients with chronic pain. *Pain Med* 2008; 9(8):979-984

Bruce BK, Townsend CO, Hooten WM, Rome JD, Moon JS, Swanson JW. Chronic pain rehabilitation in chronic headache disorders. *Curr Neurol Neurosci Rep* 2008; 8(2):94-99

AWARDS/LEADERSHIP

W. Michael Hooten, MD, Chair, Research Committee, Division of Pain Anesthesia

Cynthia Townsend, MD, Chair, Pain Rehabilitation Special Interest Group, American Pain Society, 2008-present

BRAIN REHABILITATION

Investigators

Allen W. Brown, MD and Thomas Bergquist, PhD

The brain rehabilitation research group is composed of a multidisciplinary team including members from the Departments of Nursing, Physical Medicine and Rehabilitation, Neurology, Social Services, and Psychiatry and Psychology. Current research studies include contribution of cases to the traumatic brain injury TBI Model System national database, validation of a first of its kind outcome measure to assess the effectiveness of cognitive rehabilitation, interventions on the ability of individuals with brain injury to advocate for themselves and their communities, and assessing the effectiveness of telemedicine to deliver cognitive rehabilitation. Collaborative studies with other institutions include examining post-traumatic headaches, changes in sexuality following traumatic brain injury (TBI), the effect of environment on outcome after TBI, and teaching coping skills to family members. The group networks with a variety of other academic institutions and agencies doing similar research, including the Brain Injury Associations of Minnesota, Iowa, and Wisconsin; University of Wisconsin; Rehabilitation Hospital of Indiana; Brooks Rehabilitation Hospital in Jacksonville, Florida; and other NIDRR funded TBI Model Systems.



Front: Anne M. Moessner
Back: Bergquist,
Kathryn S. Kendall, and
Brown

GRANTS

Mayo Clinic Clinical Research Award (CR20); Telehealth with Acquired Brain Injury.
Funding period: 07/2008 – 06/2010; PI: Bergquist

National Institute on Disability and Rehabilitation Research (NIDRR); Mayo TBI Model System.
Funding period: 10/2007 – 09/2012; PI: Brown

KEY PUBLICATIONS

Bergquist T, Gehl C, Lepore S, Holzworth N, Beaulieu W. Internet-based cognitive rehabilitation in individuals with acquired brain injury: A pilot feasibility study. *Brain Inj* 2008; 22(11):891-897

Locke DE, Smigielski JS, Powell MR, Stevens SR. Effort issues in post-acute outpatient acquired brain injury rehabilitation seekers. *NeuroRehabilitation* 2008; 23(3):273-281

Manno EM, Rabinstein AA, Wijdicks EF, Brown AW, Freeman WD, Lee VH, Weigand SD, Keegan MT, Brown DR, Whalen FX, Roy TK, Hubmayr RD. A prospective trial of elective extubation in brain injured patients meeting extubation criteria for ventilatory support: A feasibility study. *Crit Care* 2008; 12:R138



Patton

BEHAVIORAL HEALTH

Investigators

Christi Patten, PhD, Pamela S. Sinicrope, PhD, and Shawna Ehlers, PhD

Christi Ann Patten, PhD, Professor of Psychology and Career Scientist, leads the Behavioral Health Research Program in the Mayo Clinic Cancer Center and focuses her research on developing novel, theory-based behavioral interventions for tobacco cessation. Contributions have included tobacco cessation interventions for adolescents and smokers with psychiatric comorbidity, and social support and smoking cessation. A large clinical trial is underway to examine the efficacy of a support-person intervention to enhance smoker utilization of the Minnesota QUITPLAN Helpline. A focus of research for other group members targets cancer survivors and their family members for lifestyle intervention and other basic behavioral research with the goal of cancer risk reduction. Dr Sinicrope received pilot funding from Mayo Clinic Cancer Center to assess interest in lifestyle behavioral interventions for family members of colorectal, pancreatic, and lung cancer survivors. The team is currently engaged in a study of the health behaviors of survivors of Lymphoma/Leukemia through collaboration with Dr Jim Cerhan, the principal investigator of the Mayo Clinic/Iowa Lymphoma/Leukemia NIH funded Spore Grant.

Another area of focus is a commitment to reducing cancer health disparities among Native Americans. During the past seven years, the team has established a successful partnership with the Alaska Native community in Western Alaska. A long-term goal of the partnership is to establish the research infrastructure and develop evidence-based programs to reduce tobacco-related health disparities among Alaska natives. In addition, with funding through an NCI P20 grant, the team is developing programs to train Dine' College (Navajo) undergraduates in cancer prevention research. A long-term goal of the partnership is to create a research infrastructure and develop evidence-based programs to reduce tobacco-related health disparities among Alaska natives.



Front: Ehlers, Sinicrope, Gail Bierbaum
Back: Patten, Paul Decker, Christine Hughs, Christina Smith

GRANTS

National Cancer Institute
Dine' College/Mayo Clinic: Developing Cancer Researchers.
Funding period: 2006 – 2010
PI: Patten

ClearWay Minnesota
Standard Research Award Enhancing Smoker Utilization of the Minnesota Quitline through Support Persons.
Funding period: 2006 – 2009
PI: Patten

National Cancer Institute and National Institute on Drug Abuse.
Tobacco Cessation Treatment for Pregnant Alaska Natives. Funding period: 2007 – 2009
PI: Patten

KEY PUBLICATIONS

Patten CA, Enoch C, Renner CC, Offord KP, Nevak C, Kelley SF, Thomas J, Decker PA, Hurt RD, Lanier A, Kaur JS. Focus groups of Alaska native adolescent tobacco users: Preferences for tobacco cessation interventions and barriers to participation. *Health Educ Behav* 2009, in press

Patten CA, Smith CM, Brockman TA, Decker PA, Anderson KJ, Hughes CA, Sinicrope P, Offord KP, Lichtenstein E. Support person intervention to promote smoker utilization of the QUITPLAN Helpline. *Am J Prev Med* 2008; 35 (6 Suppl):S479-S485

Sinicrope PS, Vernon SW, Diamond PM, Patten CA, Kelder SH, Rabe KG, Petersen GM. Development and preliminary validation of the cancer family impact scale for colorectal cancer. *Genet Test* 2008; 12, 161-169

Patten CA, Renner CC, Decker PA, O'Campo E, Larsen K, Enoch C, Offord KP, Hurt RD, Lanier A, Kaur J. Tobacco use and cessation among pregnant Alaska natives from Western Alaska enrolled in the WIC Program. *Matern Child Health J* 2008; 12:30-36

Patten, CA, Brockman, TA, Ames, SC, Ebbert, JO, Stevens, SR, Thomas, JL, Werch, CE, Kiros, G, Kershaw, JM, and Carlson, JM. (2008). Differences among black and white young adults on prior attempts and motivation to help a smoker quit. *Addictive Behaviors*, 33, 496-502

Patten, C.A., Petersen, L.R., Brockman, T., Gerber, T., Offord, K.P., Ebbert, J.O., Hughes, C.A., Decker, P.A., Beddow, C., Pyrin K., Quigg, S., & Boness, J. (2008). Development of a telephone-based intervention for support persons to help smokers quit. *Psychology, Health, & Medicine*, 13, 17-28

Patten, C.A., Decker, P.A., Dornelas, E.A., Barbagallo, J., Rock, E., Offord, K.P., Hurt, R.D., & Pingree, S. (2008). Changes in readiness to quit and self-efficacy among adolescents receiving a brief office intervention for smoking cessation. *Psychology, Health, and Medicine*, 13, 326-336

Patten, C.A., Enoch, C., Renner, C.C., Offord, K.P., Nevak, C., Theusch, S.F., Thomas, J.T., Decker, P.A., Hurt, R.D., Lanier, A., & Kaur, J. (2008). Focus groups of Alaska Native teen tobacco users: Preferences for tobacco cessation interventions and barriers to participation. *Health Education and Behavior*. DOI: 10.1177/1090198107309456

Patten, C.A., Renner, C.C., Decker, P.A., O'Campo, E., Larsen, K, Enoch, C., Offord, K.P., Hurt, R.D., Lanier, A., & Kaur, J. (2008). Tobacco use and cessation among pregnant Alaska natives from Western Alaska enrolled in the WIC Program. *Maternal and Child Health Journal*. DOI 10.1007/s10995-008-0331-7

AWARDS / LEADERSHIP

Christi Patten PhD Panel Expert at National Institute of Health for tobacco cessation and reducing cancer health disparities.

Christi Patten PhD Standing study section member of the National Institute on Drug Abuse Treatment Research Subcommittee (NIDA-E).



Front row: Geda, Pankratz,
Dana Swenson-Dravis, Ruth
Cha, Petersen
Second row: Rocca,
Teresa Christianson,
Roger Muller
Last row: Mary Dugdale,
Knopman

NEURO-PSYCHIATRIC RESEARCH OF THE MAYO CLINIC STUDY OF AGING IN ROCHESTER, MINNESOTA

Investigators

Yonas E. Geda, MD, Walter A. Rocca, MD, MPH,
Vernon S. Pankratz, PhD, David S. Knopman, MD, and
Ronald C. Petersen, MD, PhD

The population-based Mayo Clinic Study of Aging serves as a research infrastructure for the K01 funded Neuropsychiatric research. The primary goal of the K01 project is to determine the prevalence of neuropsychiatric symptoms in normal cognitive aging and mild cognitive impairment.

GRANTS

Mayo Clinic Center for Translational Science Activities Career Transition Award: Neuroimaging Correlates of Neuropsychiatric Symptoms. Funding period: 01/2009 – 01/2009: PI: Geda

National Institute on Aging/National Institutes of Health; Alzheimers Disease Patient Registry. The Mayo Clinic Study of Aging. Funding period: 01/2004 – 01/2009: PI: Petersen

National Institute of Mental Health/National Institutes of Health
Mentored Research Scientist Development Award for New Minority Faculty; Psychiatric Characterization of Mild Cognitive Impairment. Funding period: 01/2004 – 01/2009
PI: Geda

KEY PUBLICATIONS

Knopman DS, Roberts RO, Geda YE, Boeve BF, Pankratz VS, Cha RH, Tangalos EG, Ivnik RJ, Petersen RC. Association of prior stroke with cognitive function and cognitive impairment. Arch Neurol 2009, in press

Geda YE, Roberts RO, Knopman DS, Petersen RC, Christianson TJ, Pankratz VS, Smith GE, Boeve BF, Ivnik RJ, Tangalos EG, Rocca WA. The prevalence of neuropsychiatric symptoms in normal cognitive aging and mild cognitive impairment: A population-based study. Arch Gen Psychiatry 2008; 65:1193-1198

Roberts RO, Geda YE, Knopman DS, Cha RH, Pankratz VS, Boeve BF, Ivnik RJ, Tangalos EG, Petersen RC, Rocca WA. The Mayo Clinic Study of Aging: design and sampling, participation, baseline measures and sample characteristics. Neuroepidemiology 2008; 30:58-69

Geda YE, Boeve BF, Negash S, Graff-Radford NR, Knopman DS, Parisi JE, Dickson DW, Petersen RC. Neuropsychiatric features in 36 pathologically confirmed cases of corticobasal degeneration. J Neuropsychiatry Clin Neurosci 2007; 19:77-80

NEURO-PSYCHIATRIC RESEARCH MAYO CLINIC IN SCOTTSDALE/PHOENIX, ARIZONA

Investigators

Cynthia Stonnington, MD, Dona Locke, PhD, David Osborne, PhD., Richard Caselli, MD, and Bryan Woodruff, MD

The main goal of this research program is to determine the correlation between genetic risk for Alzheimer's Disease (apolipoprotein E [apoe] genotype) and the effect of normal aging on certain measures of cognitive function, brain volume, and brain metabolism.

GRANTS

Mayo Clinic Clinical Research Award (CR-20); Predicting Alzheimer's Disease Using Supervised Machine Learning Applied to Anatomical Magnetic Resonance Images. Funding period: 07/2006 – 7/2008; PI: Stonnington

Arizona Alzheimer's Research Consortium, AAC 2008-11A. Funding Period: 07/2008 – 06/2009; PI and Clinical Core Director: Caselli

Mayo Clinic Scholarly Opportunity Award; Fibrillar Amyloid and Structural Correlates of Cognitive Decline among Cognitively Normal Pre-MCI Individuals. Funding period: 2009 to present; PI: Stonnington,

Alzheimer's Disease Core Center. Funded by National Institute on Aging. (P30 AG019610-06). Funding period: 07/2006 – 06/2011; PI: Caselli

PET, APOE & the Preclinical Course of Alzheimer Disease. Funded by National Institute on Aging. (R01 AG031581). Funding period: 04/2008 – 03/2013; PI: Caselli

KEY PUBLICATIONS

Stonnington CM, Snyder PJ, Hentz JG, Reiman EM, Caselli RJ: The Cognitive Effects of Lorazepam in healthy APOE- $\epsilon 4$ Carriers, *Journal of Clinical Psychiatry* 2009, in press.

Klöppel S, Stonnington CM, Barbieri J, Chen F, Chu C, Good CD, Mader I, Mitchell LA, Patel AC, Roberts CC, Fox NC, Jack CR Jr, Ashburner J, Frackowiak RS. Accuracy of dementia diagnosis: A direct comparison between radiologists and a computerized method. *Brain* 2008; 31:2969-2974

Klöppel S*, Stonnington CM*, Chu C, Draganski B, Scahill RI, Rohrer JD, Fox NC, Jack CR Jr, Ashburner J, Frackowiak RS. Automatic classification of MR

scans in Alzheimer's disease. *Brain* 2008; 131:681-689 (*both authors contributed equally)

Klöppel S*, Stonnington CM*, Chu C, Draganski B, Scahill RI, Rohrer JD, Fox NC, Ashburner J, Frackowiak RS. A plea for confidence intervals and consideration of generalizability in diagnostic studies. *Brain* 2008 (*both authors contributed equally)

Stonnington CM, Tan G, Klöppel S, Chu C, Draganski B, Jack CR Jr, Chen K, Ashburner J, Frackowiak RS. Interpreting scan data acquired from multiple scanners: A study with Alzheimer's disease. *Neuroimage* 2008; 39:1180-1185

Locke DE, Smigielski JS, Powell MR, Stevens SR. Effort issues in post-acute outpatient acquired brain injury rehabilitation seekers. *NeuroRehabilitation* 2008; 23(3):273-281

Locke DE, Cerhan JH, Wu W, Malec JF, Clark MM, Rummans TA, Brown PD. Cognitive rehabilitation and problem-solving to improve quality of life of patients with primary brain tumors: A pilot study. *J Support Oncol* 2008; 6(8):383-391

Locke DE, Ivnik RJ, Cha RH, Knopman DS, Tangalos EG, Boeve BF, Petersen RC, Smith GE. Age, family history, and memory and future risk for cognitive impairment. *J Clin Exp Neuropsychol* 2009; 31(1):111-116

Locke DE, Dassel KB, Hall G, Baxter LC, Woodruff BK, Hoffman Snyder C, Miller BL, Caselli RJ. Assessment of patient and caregiver experiences of dementia-related symptoms: Development of the Multidimensional Assessment of Neurodegenerative Symptoms questionnaire. *Dement Geriatr Cogn Disord* 2009; 27(3):260-272



Front: Stonnington, Locke
Back: Caselli, Woodruff



Smith, Ivnik, and Machulda



Pedraza, Ferman, Lucas

AGING AND COGNITION

Investigators

Robert Ivnik, PhD, Mary Machulda, PhD, Glenn Smith, PhD, Yonas Geda, MD, Tanis Ferman PhD, John Lucas, PhD, Otto Pedraza PhD, and Dona Locke, PhD

The aging and cognition group's research focus is the early detection of and early intervention with dementing illness. Neuropsychologists and neuropsychiatrists are key collaborators in major aging and dementia projects at all three Mayo Clinic campuses. Such collaborations include research that has promulgated the concept of mild cognitive impairment as a pre-dementia risk state for all dementias, including Alzheimer's disease and Lewy Body dementia. The group also has helped develop the neuropsychological norms necessary to identify the pre-dementia cognitive, clinical, and sleep profiles for the early detection of Alzheimer's and Lewy Body disease. Group members are actively engaged in studies regarding behavioral interventions that can mitigate normal cognitive aging and compensate for the deficits present in mild cognitive impairment. This group includes colleagues in neurology, neuroimaging, neuropathology, molecular biology, pharmacology and others. The Study on Aging and Alzheimer's Disease Center is one of Mayo Clinic's most multidisciplinary and translational research programs.

GRANTS

National Institute on Aging; Mayo Clinic Alzheimer's Disease Research Center. Funding Period: 05/2004 – 04/2014; PI (Information Transfer Core): Smith)

National Institute on Aging; Neuropsychology of Dementia with Lewy Bodies. Funding Period: 10/2005 – 09/2010; PI: Ferman

POSIT Science Corporation; Computer-Based Training for Cognitive Enhancement: Auditory Training in Home, Two-Arm Model. Funding period: 05/2006 - 04/2010; PI: Smith

Elders. National Institute on Aging Population-Based Study of MCI Heterogeneity in African American Elders. Funding period: 09/2006 - 05/2011; PI: Pedraza

Alzheimer's Association; Treatment of Obstructive Sleep Apnea in Patients with MCI or AD. Funding period: 05/2004 - 04/2014; PI: Boeve

KEY PUBLICATIONS

Locke DE, Ivnik RJ, Cha RH, Knopman DS, Tangalos EG, Boeve BF, Petersen RC, Smith GE. Age, family history, and memory and future risk for cognitive impairment. *J Clin Exp Neuropsychol* 2009; 31(1):111-116

Greenaway MC, Smith GE, Tangalos EG, Geda YE, Ivnik RJ. Mayo older Americans normative studies: Factor analysis of an expanded neuropsychological battery. *Clin Neuropsychol* 2009, in press

Geda YE, Roberts RO, Knopman DS, Petersen RC, Christianson TJ, Pankratz VS, Smith GE, Boeve BF, Ivnik RJ, Tangalos EG, Rocca, WA. The prevalence of neuropsychiatric symptoms in mild cognitive impairment and normal cognitive aging: A population-based study. *Arch Gen Psychiatry* 2008; 65:1193-1198

Greenaway MC, Hanna SM, Lepore, SW, Smith GE. A behavioral rehabilitation intervention for amnesic mild cognitive impairment. *Am J Alzheimers Dis Other Dement* 2008; 23:451-461

TRANSPLANT PSYCHIATRY AND TRANSPLANT ADDICTIONS PSYCHIATRY

Investigators

Sheila Jowsey, MD, Terry Schneekloth, MD,
Katherine Moore, MD,
Christina Wichman, MD,
Dahlia Saad Pendergrass, MD,
Gen Shinozaki, MD, and Victoria Passov, MD

This multidisciplinary group is involved in a number of IRB approved research protocols and National Institute of Health or Mayo Clinic funded clinical trials related to understanding the relationship between psychiatric factors and outcomes following transplantation. The group also is interested in the outcomes of living donor surgery including long-term psychiatric outcomes. They have begun exploring the role of genomics in determining psychiatric outcomes following transplantation. Members of this research group have collaborated with colleagues in geriatric psychiatry to learn more about the experience of geriatric patients post transplant. In 2009, the group will pursue further research addressing psychosocial factors leading to neurotoxicity and delirium post transplant.



Front: Susan Cutshall,
Moore, Passov
Back: Jowsey, Schneekloth,
Wichman, Susanna Stevens

GRANTS

NIH/NIAID

Renal and Lung Living Donors Evaluation Study (RELIVE)

Funding Period: 07/2006 - 06/2011

PI: Taler

Mayo Small Grant Program

Exploring the Relationship between Selected Genetic Polymorphisms of Transplant Patients and Depression.

Funding Period: 07/2006 - 06/2011

PI: Shinozaki and Jowsey

KEY PUBLICATIONS

Jowsey SG, Schneekloth TD. Psychosocial factors in living organ donation: Clinical and ethical challenges. Transplant Rev 2008; 22(3):192-195

CANCER

Investigators

Steve C. Ames, PhD, Matthew M. Clark, PhD, Dona E.C. Locke, PhD, Pamela J. Netzel, MD, Jarret W. Richardson, MD, and Teresa A. Rummans, MD

By first assessing and treating psychiatric difficulties, and then teaching skills for coping with cancer we strive to improve the quality of life for cancer patients and their caregivers, which is the primary goal of the cancer research team. This multidisciplinary team, across the three Mayo sites, is involved in several studies that have either sought to identify predictors of quality of life in cancer survivors, or have offered tailored multidisciplinary interventions designed to improve the quality of life of cancer patients.



Netzel, Clark, and Richardson



Locke



Ames

GRANTS

Mayo Clinic Clinical Research Award (CR 20); Motivational Interviewing to Enhance Smoking Cessation in Radiation Oncology Patients. Funding period: 01/2007 – 12/2009; PI: Garces (Radiation Oncology)

Lance Armstrong Foundation; Quality of Life Intervention for Biochemical Recurrence of Prostate Cancer. Funding period: 01/2005 – 12/2008; PI: Ames

James and Esther King Biomedical Research

Program; Quality of Life of Patients with Renal Cell Carcinoma. Funding period: 01/2008 – 12/2010; PI: Ames, S

Linse Bock Foundation ; A Structured Multidisciplinary Intervention to Improve Quality of Life of Patients Receiving Active Oncological Treatment: A Randomized Trial. Funding period: 03/2004 – 02/2010; PI: Clark

National Cancer Institute; Health and Quality of Life Among Long-Term Lung Cancer Survivors. Funding period: 01/2006 – 12/2011; PI: Yang,P (Cancer Center, Epidemiology)

KEY PUBLICATIONS

Locke DE, Cerhan JH, Wenting W, Malec JF, Clark MM, Rummans TA, Brown PD. A combined cognitive rehabilitation and problem-solving focused intervention to improve the quality of life of patients with primary brain tumors: A pilot study. J Support Oncology 2009, in press

Ames SC, Tan WW, Ames GE, Stone RL, Rizzo TD Jr, Heckman MG, Crook JE, Clark MM, Rummans TA, Werch CE. Quality of life of men with biochemical recurrence of prostate cancer. J Psychosoc Oncol 2008; 26:17-34

Brown PD, Decker PA, Rummans TA, Clark MM, Frost MH, Ballman KV, Arusell RM, Buckner JC. A prospective study of quality of life in adults with newly diagnosed high-grade gliomas: Comparison of patient and caregiver ratings of quality of life. Am J Clin Oncol 2008; 31:163-168

Clark MM, Novotny PJ, Patten CA, Rausch SM, Garces YI, Jatoi A, Sloan JA, Yang P. Motivational readiness for physical activity and quality of life in long-term lung cancer survivors. Lung Cancer 2008; 61:117-122

Petersen LR, Clark MM, Novotny P, Kung S, Sloan JA, Patten CA, Vickers KS, Rummans TA, Frost MH, Colligan RC. Relationship of optimism-pessimism and health-related quality of life in breast cancer survivors. J Psychosoc Oncol 2008; 26:15-32

OBESITY

Investigators

Matthew M. Clark, PhD, Karen Grothe, PhD, and Donald E. McAlpine, MD

This multidisciplinary research team is involved in several clinical projects and two National Institutes of Health funded clinical trials which are seeking to examine the role of how psychiatric and psychological functioning impacts outcome from obesity or eating disorder treatment programs, and to learn more about how psychiatric or psychological functioning may change following weight loss. We are involved in two National Institute of Diabetes and Digestive and Kidney Diseases funded studies. The primary aim of one study is to examine the role of 24 hour energy expenditure in obesity, and the other is a randomized clinical trial that is exploring the role of genomics in predicting outcome to a pharmacologic and behavioral weight loss program. Through our investigations we hope to improve the selection of participants for weight loss programs, and to enhance the long term psychosocial functioning of patients who have lost weight.



Sarah Kalsy,
McAlpine,
Karen Graszer,
Grothe, and Clark

GRANTS

National Institute of Diabetes and Digestive Diseases
Pharmacogenomics of Gastric Function and Weight in Obesity.
Funding period: 03/2004 – 02/2010; PI: Camilleri (GI)

National Institute of Diabetes and Digestive Diseases
Nutritional Restriction and Activity Thermogenesis.
Funding period: 01/2003 – 12/2009; PI: Levine (Endocrinology)

KEY PUBLICATIONS

Grundell AB, Sweetser S, Camilleri M, Eckert DJ, Vazques Roque MI, Carlson PJ, Burton DD, Braddock AE, Clark MM, Graszer KM, Kalsy SA, Zinsmeister AR. A controlled pharmacogenetic trial of sibutramine on weight loss and body composition in obese or overweight adults. *Gastroenterology* 2008; 135(4):1142-1154

Clark MM, Hanna BK, Mai JL, Graszer KM, Krochta JG, McAlpine DE, Reading S, Abu-Lebdeh HS, Jensen MD, Sarr MG. Sexual abuse survivors and psychiatric hospitalizations after bariatric surgery. *Obesity Surgery* 2007; 17:465-469

Vazquez Roque MI, Camilleri M, Clark MM, Tepoel DA, Jensen MD, Graszer KM, Kalsy SA, Burton DD, Baxter KL, Zinsmeister AR. Alteration of gastric functions and candidate genes associated with weight reduction in response to sibutramine. *Clin Gastroenterol Hepatol* 2007; 5:829-837

Cremonini F, Camilleri M, Clark MM, Beebe TJ, Locke GR, Zinsmeister AR, Herrick LM, & Talley NJ. Associations among binge eating behavior patterns and gastrointestinal symptoms: A population-based study. *Int J Obesity*, in press



Clark, Sim, and McAlpine

EATING DISORDERS

Donald E. McAlpine, MD, Leslie A. Sim, PhD, and Matthew M. Clark, PhD

This multidisciplinary research team is involved in several clinical projects which are seeking to understand the neurobiology and treatment of eating disorders. This research team is aware of the emerging interests in the biological dimensions of eating disorders and is in the early stages of using neuroimaging technology to understand neurobiological aspects of anorexia and bulimia nervosa. They also seek to examine the role of family functioning in adolescent eating disorders. The question of how athletes with eating disorders differ from non-athletes presenting for help with eating disorders is currently under study. The application of

non-exercise activity thermogenesis (NEAT) to anorexia nervosa is a novel way to try and understand and monitor weight regulation. The team also is involved in several clinical outcome projects including a study evaluating family based inpatient treatment. Through the investigations, the team hopes to enhance the outcomes for individuals suffering from eating disorders.

KEY PUBLICATIONS & PRESENTATION:

Sim L, Homme, J, Ltief, A, Vande Voort, J, Schak, K, Ellingson, J. Family functioning and maternal distress in adolescent AN. *International Journal of Eating Disorders*. 2009 in press

Sim L, McGovern, L, Swiglo, BA, Elamin, MB, Erwin, PJ, and Montori, VM. Effect on bone health of estrogen use in premenopausal women with anorexia nervosa. A systematic review and meta-analyses. *International Journal of Eating Disorders*. 2009, in press

Cermonini, F, Camilleri, M, Clark, MM, Beebe, TJ, Locke, GR, Zinsmeister AR, Herrick LM, & Talle, NJ. (in press) Associations among binge eating behavior patterns and gastrointestinal symptoms: A population based study. *International Journal of Obesity*. 2009, in press

Lapid, M, Prom B, McAlpine DE, Suto, B, Rummans TA. Eating disorders in the elderly. *International Conference on Eating Disorders, Cancun Mexico, May, 2009*

Sim L, McGovern L, Elamin M, Swiglo B, Erwin P, Montori V, The influence of estrogen therapies on bone mineral density in premenopausal women with anorexia nervosa and amenorrhea. *International Conference on Eating Disorders, Cancun Mexico, May, 2009*

Harris AM, McAlpine D, Shirbhate R, Manohar CU, and Levine JA. Measurement of daily activity in restrictive type anorexia nervosa. *Int J Eat Disorder* 2008; 41: 280-3

Sim L, Homme J, Ltief A, Vande Voort J, Schak K, Ellingson J Family functioning in adolescent AN. *International Conference on Eating Disorders, Seattle WA, May, 2008*

PSYCHOSOMATICS

Investigators

James R. Rundell, MD, Jeffrey Staab, MD, Richard Seime, PhD, Lois Krahn, MD, Karen Grothe, PhD, Cynthia Stonnington, MD; John Schmidt, PhD, Shawna Ehlers, PhD, Christina Wichman, DO, and Dahlia Saad-Pendergrass, MD

The Psychosomatics Research Group investigates outcomes of consultation and interventions in patients at the interface between medical and psychiatric conditions. Target areas include health anxiety, management of unexplained physical symptoms, depression and anxiety in the medically ill, resilience, and healthcare utilization.



Left to right: Staab, Pamela J. Van Sternberg, David R. Hall, Grothe, Seime, Rundel, and Rebecca K. Mueller-Guersky

GRANTS

Arizona Institute for Mental Health Research
Deficits in Mental Representation of Emotion in
Somatizing Patients. Funded by Institute for Mental
Health Research.

Funding period: 03/2008 - 03/2009

PI: Stonnington

KEY PUBLICATIONS & PRESENTATION

Krahn LE, Bostwick JM, Stonnington CM. Looking
toward DSM-V: Should factitious disorder become
a subtype of somatoform disorder? *Psychosomatics*
2008; 49(4):277-282

Rundell JR, Amundsen K, Rummans TL, Tennen
G. Toward defining the scope of psychosomatic
medicine practice: Psychosomatic medicine
in an outpatient, tertiary-care practice setting.
Psychosomatics 2008; 49(6):487-493

Wichman CL, Rothergill A, Moore KM, Lang TR,
Heise RH Jr, Watson WJ. Recent trends in selective
serotonin reuptake inhibitor use in pregnancy. *J*
Clin Psychopharmacol 2008; 28(6):714-716

Passov V, Rundell JR. Analysis of transfers from
a medical-psychiatry inpatient unit to a medical-
surgical unit within 48 hours of admission.
Psychosomatics 2008; 49(6):535-537

Krahn LE, Miller BW, Bergstrom LR: Rapid
resolution of intense suicidal ideation after
treatment of severe obstructive sleep apnea. *J Clin*
Sleep Med 2008; 15(1):64-65

Rundell JR. Models of integrated care in
Psychosomatic medicine: comparison of
collaborative care with traditional outpatient
consultation. Oral presentation at the European
Association for Consultation-Liaison Psychiatry
and Psychosomatic Medicine. June 26, 2008.
Zaragoza, Spain

Rundell JR. Antipsychotic practice patterns
among psychiatrically consulted medical-surgical
inpatients at a tertiary care medical center. Oral
presentation at the Annual Meeting of the Academy
of Psychosomatic Medicine, Miami FL, November
22, 2008

Rundell JR, Seime R. Integrated care in an
outpatient Psychosomatic Medicine practice. Oral
presentation at the Annual Meeting of the Academy
of Psychosomatic Medicine, Miami FL, November
22, 2008

SMALL GRANT HIGHLIGHTS

2008

- Adjunctive Varenicline for Smoking Cessation in Bipolar Depressed Patients: An Open-Label 12-week Feasibility Trial - *Mark Frye, MD, Christi Patten, PhD., Courtney Price, MBBS*
- Exploring the Relationship Between Selected Genetic Polymorphisms of Transplant Patients and Depression - *Shelia Jowsey, MD, Gen Shinonazki, MP*
- Hippocampal Glutamate Levels in Alcoholics - *Victor Karpyak, MD, PhD*

2007

- The Role of Tobacco in Hematopoietic Cell Transplantation (HCT) Outcomes for Leukemia Survivors - *Shawna Ehlers, PhD*
- Deliberate Self-harm in Adolescents: A Longitudinal Study - *Leslie Sim, PhD*
- The Effects of Cognitive Behavioral Treatment on Neurochemical Compounds in Patients with OCD - Evaluation of proton magnetic resonance spectroscopy: project extension - *Stephen Whiteside, PhD*

DEPARTMENT FACTS

Staffing

- 52 psychiatrists
- 24 doctorate-level psychologists
- 60 counselors and therapists
- 62 residents and fellows

Inpatient Programs — 108 licensed beds

- Psychiatry Acute Care Program
- Mood Disorders Unit
- Child, Adolescent and Family Treatment Program and Eating Disorders Program
- Geriatric/Medical Psychiatry Program
- Intensive Addiction Program (residential)

Outpatient Programs

- Consultation/Liaison Psychiatry Program
- Assessment and consultation
- Comprehensive second opinion
- Intensive Adult Outpatient Program
- Comprehensive Pain Rehabilitation Program
- Adult, Child and Adolescent Programs
- Anxiety Disorder
- Mood Disorder Clinic
- Addiction

Specialized Services

- Psychological and neuropsychological testing
- Pharmacogenomics testing
- Electroconvulsive therapy and Transcranial Magnetic Stimulation
- Neuroimaging

Clinical Education

- College of Medicine at Mayo Clinic
- Mayo School of Graduate Medical Education
- American Psychological Association Accredited
Mayo Medical Psychology Post-Doctoral Fellowship Program:
 - *Clinical Health Psychology*
 - *Clinical Child Psychology*
 - *Clinical Neuropsychology*
- Accreditation Council for Graduate Medical Education
 - *Addiction Psychiatry Fellowship Program*
 - *Child and Adolescent Psychiatry Residency Program*
 - *Psychosomatic Medicine Fellowship Program*
 - *Adult Psychiatry Residency*
 - *Geriatric Psychiatry Fellowship Program*
 - *Sleep Medicine Fellowship Program*

Scientific Research

- Psychogenomics and the genomics of addiction
- Alzheimer's/cognitive disorders
- Anxiety disorders
- Electroconvulsive therapy and Transcranial Magnetic Stimulation
- Mood Disorders and Neuroimaging

Affiliated Programs

- Executive Health Program
- Department of Neurology (including Section of Behavioral Neurology)
- General Internal Medicine
- Mayo Medical Laboratories
- Center for Sleep Medicine
- Nicotine Dependence Center (Residential)
- Patient Education Center
- Transplant Center
- Bariatric surgery





200 First Street SW
Rochester, Minnesota 55905
www.mayoclinic.org

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