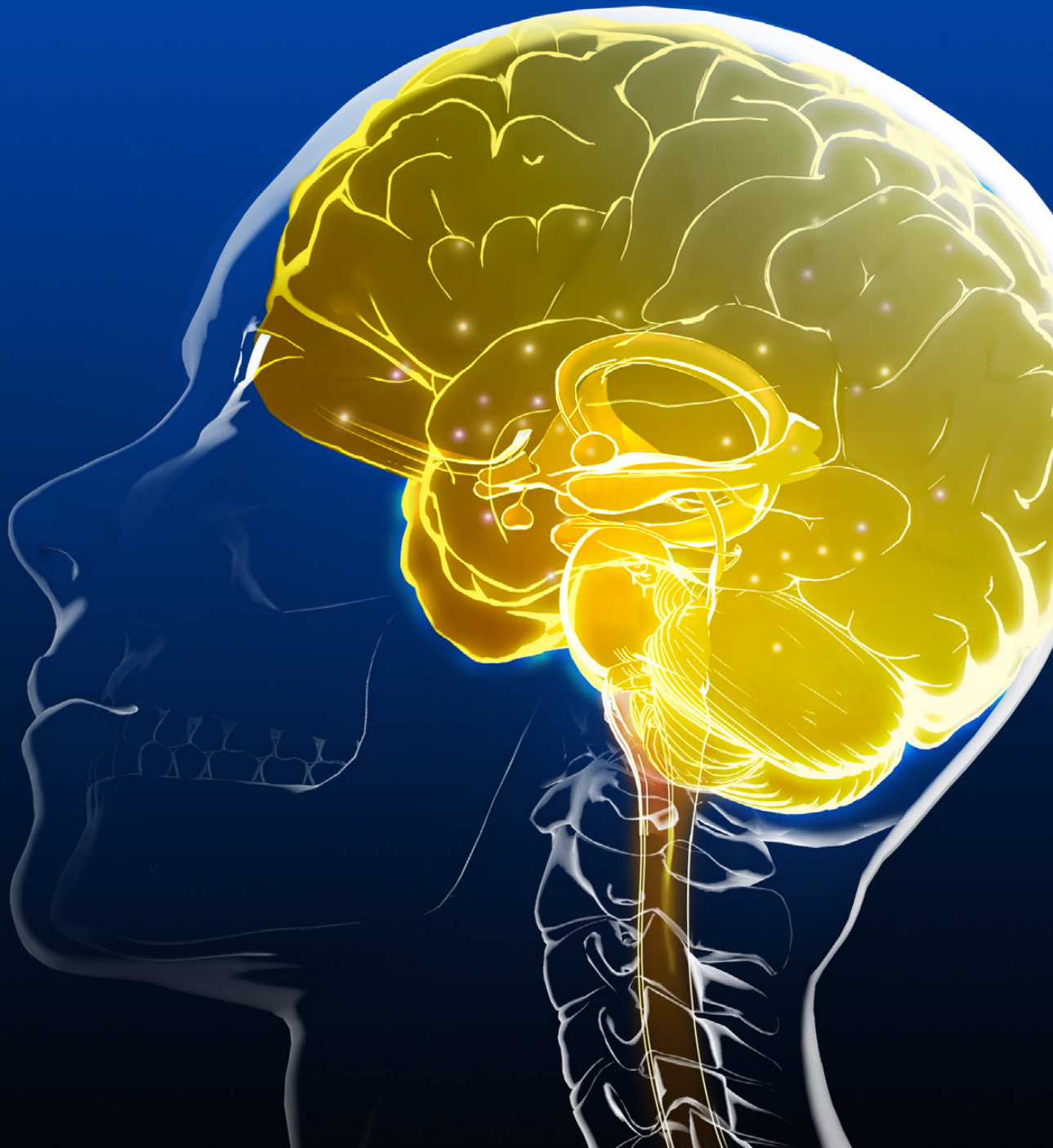


2012–2013

Research Report

Psychiatry and Psychology



Department Chairs



Mark A. Frye, M.D. (Rochester, Minnesota)



Teresa A. Rummans, M.D. (Jacksonville, Florida)



Cynthia M. Stonnington, M.D. (Scottsdale, Arizona)

Research Leadership



*Matthew M. Clark, Ph.D., L.P. (Rochester, Minnesota)
Chair of Research*

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Welcome to the 2012-2013 Research Report of the Mayo Clinic Department of Psychiatry & Psychology

Thank you for your interest in our Department of Psychiatry and Psychology and learning more about our research accomplishments over the past year. Our department plays an essential role in Mayo Clinic's goal of inspiring hope and contributing to health and well-being by providing the best care to every patient through integrated clinical practice, education, and research. At Mayo Clinic's three main campuses: Rochester, Minnesota, Jacksonville, Florida, and Scottsdale, Arizona, there are 150 psychiatrists and psychologists, joined by over 200 allied health staff to meet the needs of the patient. Our flagship clinical programs include our Psychiatric Hospital, Mayo Clinic Depression Center, Pain Rehabilitation Program, Addiction Treatment Center, Child and Adolescent Programs, Neurocognitive Assessment and Treatment Programs, Behavioral Medicine Program, and Integrated Care Programs. Our department provides numerous educational programs including Graduate Medical Education in Adult Psychiatry Residency, Child and Adolescent Psychiatry Residency, Medical Psychology Fellowship Program (Clinical Child Psychology, Clinical Health Psychology and Clinical Neuropsychology), Geriatric Psychiatry Fellowship, Psychosomatic Fellowship, Sleep Medicine Fellowship, and Addiction Psychiatry Fellowship. Due to the expertise and range of these clinical and educational programs, the U.S. News and World Report ranked our Department of Psychiatry and Psychology as one of the Top Ten Psychiatry Departments in the country in 2012. Additionally, we were the only Psychiatry and Psychology Department in the Midwest that received a national ranking. Many of our research projects focus on clinical interventions and our clinical programs guide and shape our research efforts, which in combination seek to provide the best care to every patient every day.

The Department of Psychiatry and Psychology is highlighting research teams in our 2012-13 departmental research report. We want to highlight the value, importance, and productivity of research teams within our department. These research teams can be found across the Mayo Clinic Sites, which include Minnesota, Florida, Arizona, and also involve the many hospitals that make up the Mayo Health System. For example, the Neuropsychology, Aging, and Cognition Research Team have scientific investigators across all three campuses. Research teams within our department include an array of health care professionals and are focusing on the evaluation and treatment of a range of mental health problems and their impact on patients and their families. The Mayo Clinic Depression Center Research Team, which includes psychiatrists, psychologists, nurses, and social workers in their efforts to conduct clinically relevant research in treatment-resistant depression and bipolar disorder, is an example of a highly productive clinical research team. Additionally, many investigators in our department are engaged in research projects combined with other departments or centers of excellence across our academic medical center. Our department has investigators in The Mayo Clinic Comprehensive Cancer Center, The Bariatric Surgery Center of Excellence, and The Alzheimer's Disease Research Center. Finally, we encourage the participation of research with other academic centers, collaborations and multisite studies. The University of Minnesota and the National Depression Treatment Centers are two outstanding examples.

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

In 2012 our Department had 27 Grants Funded where the Principal Investigator was a faculty member in our department and we contributed to a significant number of funded studies as co-investigators across Mayo Clinic. We have a wide portfolio and funding sources in our Department include:

- Agency for Healthcare Research and Quality
- Center of Medicare and Medicaid Services
- National Cancer Institute
- National Institute on Aging
- National Institute of Alcohol Abuse and Alcoholism
- National Institute on Drug Abuse
- National Institute of General Medical Science
- National Institute of Health and Indian Health Services
- National Institute of Mental Health

In 2012 our Department contributed to over 130 scientific publications and for more than 70 of these the primary or senior author was in our department. Top scientific journals, in which members of our Department published in, included:

- Addiction Biology
- Addiction Research and Theory
- American Journal of Psychiatry
- Biological Psychiatry
- Brain
- Cancer
- General Hospital Psychiatry
- Journal of Affective Disorders
- Journal of Clinical Psychiatry
- Lung Cancer
- Neuropsychopharmacology
- New England Journal of Medicine
- Pain
- Pharmacogenetics and Genomics
- Psychiatry Research
- Psychosomatics



Mayo Clinic Depression Center



Back: Leffler, Sola, Stone, Frye, Wall, Lapid, Croarkin
Front: KM Moore, MJ Moore

ADULT INVESTIGATORS

Renato D. Alarcón, MD
William V. Bobo, MD
Mark A. Frye, MD
Astrid A. Hoberg, RN, CNS
Theresa E. Hurne, LICSW
Simon Kung, MD
Maria I. Lapid, MD
Katherine M. Moore, MD
Mary J. Moore, RN
David Mrazek, MD,
Kathleen A. Poppe, RN
Christopher L. Sola, DO
Randall L. Stone LICSW
Susannah J. Tye, PhD
Marin Veldic, MD
Mark D. Williams, MD

PEDIATRIC INVESTIGATORS

Paul E. Croarkin, DO
John E. Huxsahl, MD
Jarrod M. Leffler, PhD, LP
Christopher A. Wall, MD

The main focus of the Mayo Clinic Depression Center 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 programs. We are also collaborating with the National Network of Depression Centers.

GRANTS

National Institute of Mental Health: 1H-MR Spectroscopy of Bipolar Depression Before and After Lamotrigine Treatment. Funding period: 07/2009-03/2014; PI: Frye.

Rules-Based Medicine, Inc.: A Feasibility Study to Develop a Biomarker Signature in Mood Disorders. PI: Frye.

Mayo Clinic 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. PI: Sola.

KEY PUBLICATIONS

Abulseoud OA, Gitlin M, Altshuler L, Frye MA. Baseline thyroid indices and the subsequent response to citalopram treatment: A pilot project. *Brain and Behavior*. 2013.

Alarcón RD, Sarabia S. Debates on the narcissism conundrum: trait, domain, dimension, type, or disorder? *J Nerv Ment Dis*. 2012; 200(1): 16-25.

Anderson RJ, Frye MA, Abulseoud OA, Lee KH, McGillivray JA, Berk M, Tye SJ. Deep brain stimulation for treatment-resistant depression: efficacy, safety and mechanisms of action. *Neurosci Biobehav Rev*. 2012; 36(8): 1920-1933.

Biernacka JM, McElroy SL, Crow S, Sharp A, Benitez J, Veldic M, Kung S, Cunningham JM, Post RM, Mrazek D, Frye MA. Pharmacogenomics of antidepressant induced mania: a review and meta-analysis of the serotonin transporter gene (5HTTLPR) association. *J Affect Disord.* 2012; 136(1-2).

Chopra A, Kolla BP, Mansukhani MP, Netzel P, Frye MA. Valproate-induced hyperammonemic encephalopathy (VHE): An update on risk factors, clinical correlates and management. *Gen Hosp Psychiatry.* 2012; 34(3): 290-298.

Croarkin PE, Nakonezny PA, Husain MM, Melton T, Buyukdura JS, Kennard BD, Emslie GJ, Kozel FA, Daskalakis ZJ. Evidence for Increased Glutamatergic Cortical Facilitation in Children and Adolescents With Major Depressive Disorder. *JAMA Psychiatry.* 2013.

Frye MA, Ebbert JO, Prince C, Lineberry TW, Geske JR, Patten CA. A feasibility study of varenicline for smoking cessation in bipolar patients with subsyndromal depression. *J Clin Psychopharmacology.* 2013.

Gitlin M, Frye MA. Maintenance therapies in bipolar disorders. *Bipolar Disord.* 2012; 14(Suppl 2): 51-65.

Kung S, Alarcon RD, Williams MD, Poppe KA, Moore MJ, Frye MA. Comparing the Beck Depression Inventory-II (BDI-II) and Patient Health Questionnaire (PHQ-9) depression measures in an integrated mood disorders practice. *J Affect Disord.* 2013; 145(3): 341-343.

Kung S, Espinel Z, Lapid MI. Treatment of nightmares with prazosin: a systematic review. *Mayo Clin Proc.* 2012; 87(9): 890-900.

Lapid MI, Drake MT, Geske JR, Mundis CB, Hegard TL, Kung S, Frye MA. Hypovitaminosis D in psychogeriatric inpatients. *J Nutr Health Aging.* 2012.

Leedahl DD, Cunningham JL, Drake MT, Mundis CB, Kung S, Frye MA, Lapid MI. Hypovitaminosis D in Psychiatric Inpatients: Clinical Correlation with Depressive Symptoms, Cognitive Impairment, and Prescribing Practices. *Psychosomatics.* 2012.

Li X, Frye MA, Shelton RC. Review of pharmacological treatment in mood disorders and future directions for drug development. *Neuropsychopharmacology.* 2012; 37(1): 77-101.

Post RM, Chang K, Frye MS. Paradigm shift: preliminary categorization of ultra-high risk for childhood bipolar disorder on clinical grounds so that preventive strategies can be studied. *J Clin Psychiatry.* 2013.

Rasmussen KG, Hanson AJ, Frye MA, Galardy CW, Kung S, Lapid MI, Lineberry TW, Palmer BA, Ritter MJ, Schak KM, Sola CL. Serial infusions of low-dose ketamine for major depression. *J Psychopharmacology.* 2013.

Shinozaki G, Romanowicz M, Passov V, Rundell J, Mrazek D, Kung S. State dependent gene-environment interaction: Serotonin transporter gene-child abuse interaction associated with suicide attempt history among depressed psychiatric inpatients. *J Affect Disord.* 2012.

Swann AC, Lafer B, Perugi G, Frye MA, Bauer M, Bahk WM, Scott J, Ha K, Suppes T. Bipolar mixed States: an international society for bipolar disorders task force report of symptom structure, course of illness, and diagnosis. *Am J Psychiatry.* 2013; 170(1): 31-42.

Wall CA, Croarkin PE, Swintak C, Koplin BA. Psychiatric pharmacogenomics in pediatric psychopharmacology. *Child Adolesc Psychiatr Clin N Am.* 2012; 21(4): 773-788.

AWARDS AND LEADERSHIP ROLES

Renato D. Alarcón, MD, Co-Editor, *Archivos de Psiquiatría*; Associate Editor, *Asia-Pacific Psychiatry*; Associate Editor, *Transcultural Psychiatry*.

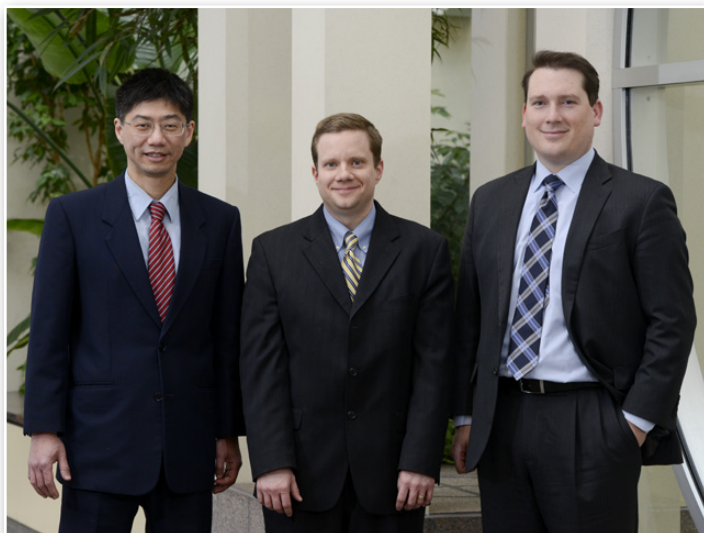
Renato D. Alarcón, MD, Member, Board of Directors, World Association of Cultural Psychiatry.

Renato D. Alarcón, MD, Workgroup Member, DSM-V Committee, American Psychiatric Association.

Mark A. Frye, MD, Co-Chair, Biomarkers Task Force, National Network of Depression Centers.

Mark A. Frye, MD, Member, Scientific Advisory Board, Depression and Bipolar Support Alliance.

Simon Kung, MD, Recipient of a Mayo Clinic Individual Award for Service Excellence 2012.



Kung, Croarkin, Wall

Transcranial Magnetic Stimulation

INVESTIGATORS

Paul E. Croarkin, DO, Simon Kung, MD, Shirlene M. Sampson, MD, Christopher A. Wall, MD

Transcranial magnetic stimulation (TMS) is a novel, noninvasive intervention that is effective in treating depression. Our TMS research group was involved in the multicenter trial that led to the US Food and Drug Administration's approval for this indication. We now are involved in research examining the use of TMS in additional patient populations, such as those with adolescent treatment-resistant depression and pain.

GRANTS

Klingenstein Third Generation Foundation: An Open-Label Trial of Repetitive Transcranial Magnetic Stimulation in Depressed Adolescents: Mechanisms of Response. Funding period: 08/2011 – 07/2013; PI: Wall.

Paul and Betty Woolls Foundation (formerly The O'Shaughnessy Foundation): A Double-Blinded, Sham-Controlled Study Utilizing rTMS in Adolescents with Major Depressive Disorder. Funding period: 07/2012 – 06/2015; PI: Wall.

Center for Translational Science Activities Clinical Research Feasibility Funds (CReFF) Program, Mayo Clinic: An Open-Label Trial of Repetitive Transcranial Magnetic Stimulation in Depressed Adolescents: Mechanisms of Response. Funding period: 07/2011 – 06/2012; PI: Wall.

KEY PUBLICATIONS

Croarkin PE, Wall CA, King JD, Andrew Kozel F, Daskalakis ZJ. Pain during transcranial magnetic stimulation in youth. *Innov Clin Neurosci*. 2011; 8(12): 18-23.

Croarkin PE, Wall CA, Lee J. Applications of transcranial magnetic stimulation (TMS) in child and adolescent psychiatry. *Int Rev Psychiatry*. 2011; 23(5): 445-453.

Croarkin PE, Wall CA, Nakonezny PA, Buyukdura JS, Husain MM, Sampson SM, Emslie GJ, Kozel FA. Increased cortical excitability with prefrontal high-frequency repetitive transcranial magnetic stimulation in adolescents with treatment-resistant major depressive disorder. *J Child Adolesc Psychopharmacol*. 2012; 22(1): 56-64.

Kung S, Ahuja Y, Iezzi R, Sampson SM. Posterior vitreous detachment and retinal tear after repetitive transcranial magnetic stimulation. *Brain Stimul*. 2011; 4(4): 218-221.

Wall CA, Croarkin PE, Sim LA, Husain MM, Janicak PG, Kozel FA, Emslie GJ, Dowd SM, Sampson SM. Adjunctive use of repetitive transcranial magnetic stimulation in depressed adolescents: a prospective, open pilot study. *J Clin Psychiatry*. 2011; 72(9): 1263-1269.

AWARDS AND LEADERSHIP ROLES

Paul E. Croarkin, DO, NARSAD Young Investigator Award 2009 to 2011; ASPIRE (Advancing Science Through Pfizer Investigator Research Exchange) Major Depressive Disorder Award 2010 to 2012.

Shirlene M. Sampson, MD, Member, Electroconvulsive Therapy Subcommittee and the Transcranial Magnetic Stimulation Subcommittee, National Network of Depression Centers; Past-President and Executive Committee Member, International Society for ECT and Neurostimulation.

Christopher A. Wall, MD, Sponsor/Investigator for 2 separate US Food and Drug Administration Investigational Device Exemptions studying the use of repetitive transcranial magnetic stimulation in depressed adolescents; Member, Transcranial Magnetic Stimulation Subcommittee, National Network of Depression Centers.

Electroconvulsive Therapy

INVESTIGATORS

Shirlene M. Sampson, MD, Keith G. Rasmussen Jr, MD, Christopher L. Sola, DO, Maria I. Lapid, MD, Simon Kung, MD, Jarrett W. Richardson, MD



Lapid, Sola, Sampson

The electroconvulsive therapy (ECT) research group at Mayo Clinic has been active in performing large, multicenter randomized controlled trials funded by the National Institute of Mental Health for more than ten years. As a member of the Consortium for Research in ECT (CORE), our current research is led by Dr. Sampson and is examining how to maintain remission of depression after a successful acute series of ECT. Dr. Rasmussen is leading a study investigating the use of ketamine vs. methohexital anesthesia in ECT treatment. Dr. Lapid is leading a study examining factors that impact the transition from inpatient to outpatient ECT treatment.

GRANTS

National Institute of Mental Health: Prolonging Remission in Depressed Elderly (PRIDE). Funding period: 07/2009 – 03/2014; Mayo Clinic PI: Sampson.

Winona State University Foundation: Factors That Influence Transition to Outpatient ECT from Inpatient Psychiatric Setting. Funding period: 03/2011 – 02/2012; PI: Lapid.

Rivera FA, Lapid MI, Sampson S, Mueller PS. Safety of electroconvulsive therapy in patients with a history of heart failure and decreased left ventricular systolic heart function. *J ECT*. 2011; 27(3): 207-213.

Somers KJ, Sola CL. Voltage-gated potassium channel-complex antibody-associated limbic encephalitis. *Psychosomatics*. 2011; 52(1): 78-81.

KEY PUBLICATIONS

Chopra A, Das P, Rai A, Kuppuswamy PS, Li X, Huston J, Philbrick K, Sola C. Catatonia as a manifestation of tacrolimus-induced neurotoxicity in organ transplant patients: a case series. *Gen Hosp Psychiatry*. 2012; 34(2): 209.

Harmandayan M, Romanowicz M, Sola C. Successful use of ECT in post-stroke depression. *Gen Hosp Psychiatry*. 2012; 34(1):102.

Martinez MW, Rasmussen KG, Mueller PS, Jaffe AS. Troponin elevations after electroconvulsive therapy: the need for caution. *Am J Med*. 2011; 124(3): 229-234.

Rasmussen KG, Richardson JW. Electroconvulsive therapy in palliative care. *Am J Hosp Palliat Care*. 2011; 28(5): 375-377.

AWARDS AND LEADERSHIP ROLES

Shirlene M. Sampson, MD, Past President and Executive Committee Member, International Society for ECT and Neurostimulation, 2010 – present; Member, Electroconvulsive Therapy Sub-committee, National Network for Depression Centers.

Suicide and Nonsuicidal Self-Injury

ADULT INVESTIGATORS

J. Michael Bostwick, MD
Timothy W. Lineberry, MD
Leslie A. Sim, PhD, LP



Bostwick, Sim, Lineberry

The suicide research group focuses on improving suicide risk assessment and management through identifying risk factors and warning signs in high-risk clinical groups. Using an Olmsted County cohort of suicide attempters who received medical care, Dr. Bostwick is investigating what proportion eventually died by suicide and what characterizes the long-term survivors compared to the dead. He is involved in ongoing projects on physician suicide, transjurisdictional suicide, and suicide in patients hospitalized on medical or surgical units. Dr. Bostwick also has launched a project looking at “scripts” or contexts within attempted suicides, to determine whether they correlate with eventual death.

In collaboration with David A. Jobes, PhD, of Catholic University of America (Washington, DC), Dr. Lineberry has validated the Suicide Status Form II (SSF) to systematize the assessment of suicidal risk among inpatients. He subsequently has incorporated it into routine clinical care at Mayo Clinic’s psychiatric hospital unit. Present efforts explore whether SSF findings during hospitalization correlate with future suicide risk in high-risk groups over time. Dr. Lineberry is serving as subject matter expert for military suicide prevention and as an adviser in shaping the military suicide research portfolio. He is currently analyzing whether clinical findings during hospitalization in different age groups and in males vs females are differentially associated with suicide risk longitudinally.

Dr. Sim’s team is involved in several projects aimed to improve the understanding of suicide and non-suicidal self-injurious behavior in adolescents. Included among the group’s projects are studies that examine the role of emotion regulation, family functioning, and peer relationships in internalizing and externalizing behavior and non-suicidal self-injurious behavior in adolescent psychiatric inpatients.

KEY PUBLICATIONS

Bostwick JM, Rackley S. Addressing suicidality in primary care settings. *Curr Psychiatry Rep.* 2012; 14: 353-359.

Lineberry TW, O'Connor SS. Suicide in the US Army. *Mayo Clin Proc.* 2012; 87(9): 871-878.

O'Connor SS, Beebe TJ, Lineberry TW, Jobes DA, Conrad AK. The association between the Kessler 10 and suicidality: a cross-sectional analysis. *Compr Psychiatry.* 2012; 53(1):48-53.

O'Connor SS, Jobes DA, Yeargin MK, Fitzgerald ME, Rodriguez VM, Conrad AK, Lineberry TW. A cross-sectional investigation of the suicidal spectrum: typologies of suicidality based on ambivalence about living and dying. *Compr Psychiatry.* 2012; 53(5): 461-467.

Rackley S, Bostwick JM. Depression in medically ill patients. *Psychiatr Clin North Am.* 2012; 35(1): 231-247.

AWARDS AND LEADERSHIP ROLES

J. Michael Bostwick, MD, Course Director, Aeschi West: Basic Principles in Working with Suicidal Patients, Mayo CME Course, Vail, CO, May 2013.

Timothy W. Lineberry, MD, Subject matter expert on suicide prevention, Military Operational Medicine Research Program, US Army.

Pediatric Anxiety Disorders Research Group

INVESTIGATORS

Stephen P. Whiteside, PhD, LP
Bridget K. Biggs, PhD, LP
Mark W. Olsen, MD
Michael S. Tiede, MA, LP
Julie E. Dammann, MA, LP



Dammann, Whiteside, Biggs, Tiede

The goal of this multidisciplinary research team is to improve the care of children and adolescents with anxiety disorders, including obsessive-compulsive disorder (OCD). During the past year, we developed Mayo Clinic Anxiety Coach, an iPhone application for anxiety treatment, and completed two studies funded by the International OCD Foundation using magnetic resonance spectroscopy to assess the neural effects of cognitive behavioral therapy (CBT) for OCD in children and adults. Our team is involved in several clinical projects including a dismantling study evaluating the relative effectiveness of different components of CBT, an examination of treatment at the health system level, piloting Anxiety Coach for anxiety management for both children and adults, investigating the relationship between anxiety symptoms and social adjustment, and developing intensive treatments for pediatric OCD. We also received an internal grant to develop an electronic assessment system for evaluating pediatric psychiatric symptoms. In 2012, presentations and workshops were given at the meetings of the Anxiety Disorder Association of America and the International OCD Foundation.

GRANT

Center for Innovation Connect Design Enable (CoDE) Fund, Mayo Clinic: Standardizing Pediatric Psychiatric Assessment throughout Mayo Clinic Health System with Individualized Electronic Assessment. Funding period: 2013; PI: Whiteside.

KEY PUBLICATIONS

Gryczkowski MR, Tiede MS, Dammann JE, Brown-Jacobsen A, Hale LR, Whiteside SP. The timing of exposure in clinic-based treatment for childhood anxiety disorders. *Behavior Modification*. 2013; 37(1): 113-127.

Jacob ML, Morelen D, Suveg C, Brown Jacobsen AM, Whiteside SP. Emotional, behavioral, and cognitive factors that differentiate obsessive-compulsive disorder and other anxiety disorders in youth. *Anxiety Stress Coping*. 2012; 25(2): 229-237.

Whiteside SP, Abramowitz JS, Port JD. Decreased caudate N-acetyl-l-aspartic acid in pediatric obsessive-compulsive disorder and the effects of behavior therapy. *Psychiatry Research*. 2012; 202(1): 53-59.

Whiteside SP, Abramowitz JS, Port JD. The effect of behavior therapy on caudate N-acetyl-l-aspartic acid in adults with obsessive-compulsive disorder. *Psychiatry Res*. 2012; 201(1): 10-16.

Whiteside SP, Gryczkowski MR, Biggs BK, Fagen R, Owusu D. Validation of the Spence Children's Anxiety Scale's obsessive compulsive subscale in a clinical and community sample. *J Anxiety Disord*. 2012; 26(1): 111-116.

Young BJ, Wallace DP, Imig M, Borgerding L, Brown-Jacobsen AM, Whiteside SP. Parenting behaviors and childhood anxiety: A psychometric investigation of the EMBU-C. *Journal of Child and Family Studies*.



Samuel C. Johnson Genomics of Addiction Program



Hall-Flavin, Loukianova, Frye, Mrazek, Karpyak



McCormick, Choi, Wieben, Biernacka

INVESTIGATORS

Osama A. Abulseoud, MD, Joanna M. Biernacka, PhD, Doo-Sup Choi, PhD ,
Mark A. Frye, MD, Daniel K. Hall-Flavin, MD, Victor M. Karpyak, MD, PhD,
Larissa L. Loukianova, MD, PhD, David A. Mrazek, MD, Terry D. Schneekloth, MD,
Eric D. Wieben, PhD, Richard Weinshilboum, MD, Mi Hyeon Jang, PhD, Hyung W. Nam, PhD

The Samuel C. Johnson Genomics of Addiction Program was designed to bring a multidisciplinary, integrated group of clinicians and scientists together to work synergistically to better understand how genetic vulnerability is related to the onset and treatment of alcohol use disorders. In addition, the group has concentrated on developing individualized molecular strategies for alcoholism treatment, with the primary focus on studying the pharmacogenomics of anti-craving medications.

The S.C. Johnson research team was awarded a P20 developmental center grant from the National Institute on Alcohol Abuse and Alcoholism to establish the Center for Individualized Treatment of Alcohol Dependence (CITA). The primary goal of the funded research was to develop infrastructure for an expanding research team dedicated to designing and launching systematic pharmacogenomic and imaging studies of pharmacological treatments for alcoholism, initially focused on the medication acamprosate, an FDA-approved medication for treating alcoholism. The grant has funded the creation of an expanded multidisciplinary team of investigators who work together to design and conduct preclinical and clinical studies to identify which alcohol-dependent patients are most likely to benefit from acamprosate.

With the successful implementation of the National Institutes of Health-supported P20 Center, Mayo S.C. Johnson investigators have published approximately 40 articles, including 25 peer-reviewed research articles in major journals during the last three years in the field of addiction, neuroscience, genetics and psychiatry. With future support from the NIH and benefactors, this team plans to expand its studies to better understand the best treatments for alcoholism that is co-occurring with depression. The concept of a comprehensive Center for the study of Alcoholism and Depression has recently been proposed for funding to the NIAAA.

GRANTS

National Institute of Alcohol Abuse and Alcoholism (R01): Alcohol and Adenosine-Mediated Glutamate Signaling in Neuro-Glial Interaction. Funding period: 09/2009 – 08/2014; PI: Choi.

National Institute of Alcohol Abuse and Alcoholism (NCE): The Mayo Clinic Center for Individualized Treatment of Alcohol Dependence: Administrative Core. Funding period: 09/2009 – 08/2012; PI: Mrazek.

National Institute of Alcohol Abuse and Alcoholism (NCE): The Mayo Clinic Center for Individualized Treatment of Alcohol Dependence: Project 1, Behavioral and Functional Genomic Studies in Mice: An Acamprostate Probe Study. Funding period: 09/2009 – 08/2012; PI: Choi.

National Institute of Alcohol Abuse and Alcoholism (NCE): The Mayo Clinic Center for Individualized Treatment of Alcohol Dependence: Project 2, A Probe Study of Acamprostate: Genes Associated With Response. Funding period: 09/2009 – 08/2012; PI: Karpyak.

National Institute of Alcohol Abuse and Alcoholism (NCE): The Mayo Clinic Center for Individualized Treatment of Alcohol Dependence: Project 3, Magnetic Resonance Spectroscopy in Mice: An Acamprostate Probe Study. Funding period: 09/2009 – 08/2012; PI: Macura; Co-PI: Choi.

National Institute of Alcohol Abuse and Alcoholism (NCE): The Mayo Clinic Center for Individualized Treatment of Alcohol Dependence: Project 4, Magnetic Resonance Spectroscopy in Recently Detoxified Patients With Alcoholism: An Acamprostate Probe Study. Funding period: 09/2009 – 08/2012; PI: Frye; Co-PI: Port.

National Institute of Drug Abuse (R21): Methods for Detecting Interacting Risk Factors for Addictions. Funding period: 03/2010 – 02/2012; PI: Biernacka.

S. C. Johnson Genomics of Addiction. Funding period: 2003 – 2013; Co-PIs: Weiben, Mrazek; Co-Investigators: Choi, Biernacka, Koenig, Karpyak, Frye.

Mayo Clinic Center for Individualized Medicine Award: Epigenetic DNA Methylation in Bipolar Disorders. Funding period: 08/2012 – 07/2015; PI: Veldic.

Mayo Clinic Center for Individualized Medicine Award: Genetic Variation in the Glycine Signaling and Metabolic Pathways as a Pharmacogenetic Predictor of Treatment Response to Acamprostate. Funding period: 04/2012 – 04/2013; PI: Karpyak.

Mayo Clinic Center for Translational Science Activities KL2 Mentored Career Development Award: Preclinical Glutamate Modulation Through Deep Brain Stimulation as a Novel Target for Alcohol Addiction. Funding period: 07/2011 – 06/2014; PI: Abulseoud.

Mayo Clinic Department of Psychiatry & Psychology Small Grant Award 2011: Effects of Genetic Variability in PDYN and OPRK1 Genes on Cognitive Performance and Treatment Outcome in Alcohol-Dependent Subjects. Funding period: 10/14/2011 – 10/13/2013; PI: Karpyak.

St. Marys Hospital Sponsorship Board: Effects of Genetic Variability in Prodynorphin and μ -Opioid Receptor Genes on Alcohol Craving and Treatment Outcome in Alcohol-Dependent Subjects. Funding period: 10/14/2011 – 10/13/2013; PI: Karpyak.

KEY PUBLICATIONS

Abulseoud OA, Miller JD, Wu J, Choi DS, Holschneider DP. Ceftriaxone upregulates the glutamate transporter in medial prefrontal cortex and blocks reinstatement of methamphetamine seeking in a condition place preference paradigm. *Brain Res.* 2012; 1456: 14-21.

Anderson RJ, Frye MA, Abulseoud OA, Lee KH, McGillivray JA, Berk M, Tye SJ. Deep brain stimulation for treatment-resistant depression: efficacy, safety and mechanisms of action. *Neurosci Biobehav Rev.* 2012; 36(8): 1920-1933.

Asatryan L, Nam HW, Lee MR, Thakkar MM, Saeed Dar M, Davies DL, Choi DS. Implication of the purinergic system in alcohol use disorders. *Alcohol Clin Exp Res.* 2011; 35(4): 584-594.

Biernacka JM, Geske J, Jenkins GD, Colby C, Rider DN, Karpyak VM, Choi DS, Fridley BL. Genome-wide gene-set analysis for identification of pathways associated with alcohol dependence. *Int J Neuropsychopharmacol.* 2013; 16(2): 271-278.

Biernacka JM, Jenkins GD, Wang L, Moyer AM, Fridley BL. Use of the gamma method for self-contained gene-set analysis of SNP data. *Eur J Hum Genet.* 2012; 20(5): 565-571.

Hinton DJ, Lee MR, Jacobson TL, Mishra PK, Frye MA, Mrazek DA, Macura SI, Choi DS. Ethanol withdrawal-induced brain metabolites and the pharmacological effects of acamprostate in mice lacking ENT1. *Neuropharmacology.* 2012; 62(8): 2480-2488.

Karpyak VM, Geske JR, Colby CL, Mrazek DA, Biernacka JM. Genetic variability in the NMDA-dependent AMPA trafficking cascade is associated with alcohol dependence. *Addict Biol.* 2012; 17(4): 798-806.

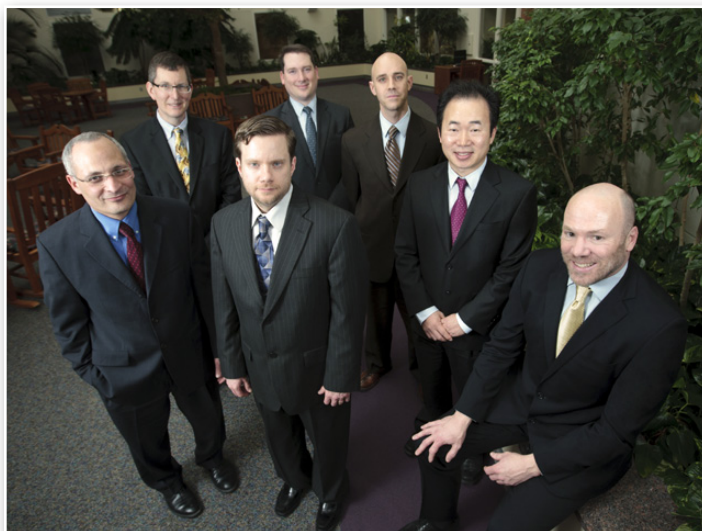
Karpyak VM, Winham SJ, Preuss UW, Zill P, Cunningham JM, Walker DL, Lewis KA, Geske JR, Colby CL, Abulseoud OA, Hall-Flavin DK, Loukianova LL, Schneekloth TD, Frye MA, Bazov I, Heit JA, Bakalkin G, Mrazek DA, Biernacka JM. Association of the PDYN gene with alcohol dependence and the propensity to drink in negative emotional states. *Int J Neuropsychopharmacol.* 2012; 1-11.

Karpyak VM, Winham SJ, Biernacka JM, Cunningham JM, Lewis KA, Geske JR, Colby CL, Abulseoud OA, Hall-Flavin DK, Loukianova LL, Schneekloth TD, Frye MA, Heit JA, Mrazek DA. Association of GATA4 sequence variation with alcohol dependence. *Addict Biol.* 2012.

Klee EW, Schneider H, Clark KJ, Cousin MA, Ebbert JO, Hooten WM, Karpyak VM, Warner DO, Ekker SC. Zebrafish: a model for the study of addiction genetics. *Hum Genet.* 2012; 131(6): 977-1008.

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Nam HW, McIver SR, Hinton DJ, Thakkar MM, Sari Y, Parkinson FE, Haydon PG, Choi DS. Adenosine and glutamate signaling in neuronal-glia interactions: implications in alcoholism and sleep disorders. *Alcohol Clin Exp Res.* 2012; 36(7): 1117-1125.



Brain Imaging Group

ADULT INVESTIGATORS

Joel P. Felmlee, PhD, Mark A. Frye, MD, Osama A. Abulseoud, MD, David A. Mrazek, MD, John D. Port, MD, PhD, Heidi A. Edmonson, PhD, Stephen P. Whiteside, PhD, LP, Susannah J. Tye, PhD, Marin Veldic, MD, Paul E. Croarkin, MD, Christopher A. Wall, MD

Back: Port, Wall, Whiteside, Choi
Front: Abulseoud, Croarkin, Frye (seated)

The primary aim of the multidisciplinary psychiatric imaging research group is to develop and use imaging techniques to diagnose and guide treatment of psychiatric disease. For the past several years, the team has focused primarily on the technique of magnetic resonance spectroscopy. Recently, its investigators have turned to the field of functional and multinuclear imaging of phosphorus and lithium, in addition to positron emission tomographic imaging both in preclinical models and human subjects. The progress being made in this field is bringing new insight into complex mental illness.

GRANTS

National Institute of Mental Health: 1H-MR Spectroscopy of Bipolar Depression before and after Lamotrigine Treatment. Funding period: 07/2009 – 03/2014; PI: Frye.

National Alliance for Research in Schizophrenia and Depression (NARSAD) Young Investigator Program: Lithium Magnetic Resonance Brain Imaging for Bipolar Disorder. Funding period: 08/2010 – 08/2012; PI: Edmonson; Mentors: Frye, Jack.

KEY PUBLICATIONS

Kim JP, Min HK, Knight E, Abulseoud OA, Marsh MP, Kelsey K, Duffy PS, Blaha C, Bennet KE, Frye MA, Lee KH. Centromedian-Parafascicular Deep Brain Stimulation Modulates Motor, Associative, and Limbic circuits: 3T fMRI Study in Large Animal Biological Psychiatry.

Knight E, Min HK, Hwang SC, Marsh M, Kim I, Felmlee J, Abulseoud OA, Frye MA, Lee KH. Insular and Prefrontal Cortical Activation During Nucleus Accumbens High Frequency Stimulation in a Large Animal Model: a functional MRI study. *PLOS ONE*.

Port JD, Rampton KE, Shu Y, Manduca A, Frye MA. Short TE (7) Li-MRS confirms bi-exponential lithium T2 relaxation in humans and clearly delineates two bathing subtypes. *J Magn Reson Imaging*; 2013.

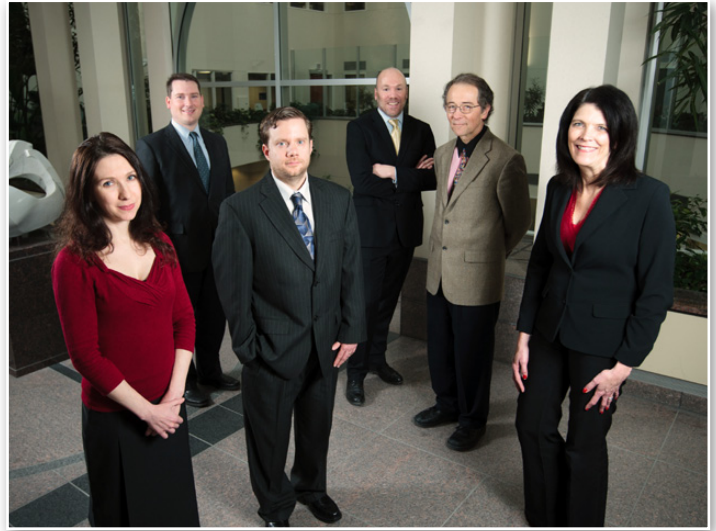
Whiteside SP, Abramowitz JS, Port JD. The effect of behavior therapy on caudate N-acetyl-l-aspartic acid in adults with obsessive-compulsive disorder. *Psychiatry Res*. 2012; 201(1): 10-16.

Individualized Medicine Biobank for Bipolar Disorder

INVESTIGATORS

Mark A. Frye, MD, Joanna M. Biernacka, PhD, Mohit Chauhan, MD, Julie M. Cunningham, PhD, Christine W. Galardy, MD, PhD, Simon Kung, MD, Timothy W. Lineberry, MD, Teresa A. Rummans, MD, Bruce Sutor, MD (Rochester, Minnesota)

Cynthia M. Stonnington, MD (Scottsdale, Arizona)



Back: Wall, Frye, Jensen
Front: Biernacka, Croarkin, Seymour

Researchers are establishing a large-scale biobank for bipolar type I disorder, collecting both biological samples and clinical data from 2,000 individuals. This is a multisite endeavor, with Mayo Clinic in Rochester, Minnesota, serving as the primary project site. Other sites that will assist in the recruitment of participants include Mayo Clinic Florida, Mayo Clinic 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 using 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 early intervention is particularly important in bipolar disorder because the initiation of any treatment is often delayed by more than a decade. Additionally, identification of pharmacogenomic predictors of treatment response could provide increased selectivity to treatment recommendations, as well as help prevent such serious adverse events as antidepressant-induced mania.

GRANT

Development Award: Marriott Individualized Medicine Biobank for Bipolar Disorder. Funding period: 12/2008 – 12/2011; Co-PIs: Frye, Biernacka.

Fridley BL, Biernacka JM. Gene set analysis of SNP data: benefits, challenges, and future directions. *Eur J Hum Genet.* 2011; 19(8): 837-843.

KEY PUBLICATIONS

Biernacka JM, Jenkins GD, Wang L, Moyer AM, Fridley BL. Use of the gamma method for self-contained gene-set analysis of SNP data. *Eur J Hum Genet.* 2012; 20(5): 565-571.

Frye MA. Clinical practice. Bipolar disorder: a focus on depression. *N Engl J Med.* 2011; 364(1): 51-59.

Biernacka JM, McElroy SL, Crow S, Sharp A, Benitez J, Veldic M, Kung S, Cunningham JM, Post RM, Mrazek D, Frye MA. Pharmacogenomics of antidepressant induced mania: a review and meta-analysis of the serotonin transporter gene (5HTTLPR) association. *J Affect Disord.* 2012; 136(1-2): e21-29.

Li X, Frye MA, Shelton RC. Review of pharmacological treatment in mood disorders and future directions for drug development. *Neuropsychopharmacology.* 2012; 37(1): 77-101.

Psychiatric Pharmacogenomics and Pharmacogenomic Testing Algorithm Research



Karpyak, Skime, Ji, Mrazek, Weinshilboum, Sagen, Bandel, Snyder

INVESTIGATORS

David A. Mrazek, MD
Richard W. Weinshilboum, MD
Eric D. Wieben, PhD
Kurt B. Angstman, MD
Joanna M. Biernacka, PhD
Daniel K. Hall-Flavin, MD
Astrid A. Hoberg, RN, CNS
Yuan Ji, PhD,
David J. Kitzelnick, MD
Barbara M. Rohland, MD
Daniel J. Schaid, PhD
Karla A. Schroder, RN, CNS
Jeffrey P. Staab, MD

The primary objective of this expanding clinical research effort is to better understand genetic variability as it relates to antidepressant response. The Pharmacogenomics and Pharmacodynamics of Selective Serotonin Reuptake Inhibitors project has been supported since 2005 by a grant from the National Institute of General Medical Sciences and nearly 800 patients have been studied. A second arm of this research effort has studied the use of a serotonin neuroepinephrine reuptake inhibitor, duloxetine, in patients who did not have remission when treated with escitalopram or citalopram. A renewal for the continuation of this project provides funding through 2015.

In 2010, the RIKEN Institute in Japan conducted a genome-wide association study of the initial Pharmacogenomic Research Network (PGRN) patient cohort of 398 patients. A number of gene variants were associated with response, and functional studies of these variants have been completed. The next step for this collaboration is to conduct a large, genome-wide association study of more than 1,400 samples that have been collected within a newly established International SSRI Pharmacogenomics Consortium.

A new area of research that our team has recently undertaken is emerging from the technology of induced pluripotent stem (iPS) cells. First reported in 2007 by Yamanaka and colleagues, iPS cells accomplish two remarkable feats: 1) They convert adult skin cells into stem cells (cells capable of growing into many cell types) and 2) These cells can be differentiated into neurons or other mature cell types. This technology provides the means to re-program patients' easily-obtained skin cells into their own neurons, theoretically allowing us to either understand

an individual's response to treatment or engineer a personalized treatment. Under the leadership of Dr. Ji, the PGRN team has received funding from the University of Minnesota–Mayo Clinic partnership to study iPSCs in depressed patients treated with selective serotonin reuptake inhibitors (SSRIs). Our team will be partnering with Timothy J. Nelson, MD, PhD, (Mayo Clinic) and with colleagues at the University of Minnesota and the Salk Institute for Biological Studies in California to study a subset of patients who have been in the PGRN SSRI study.

A pharmacometabolomic study of escitalopram and citalopram response was completed and its results subsequently published. Other analyses are under way as we work with colleagues at the University of North Carolina, the University of California Davis, and the Veterans Administration in Bedford, Massachusetts.

GRANTS

National Institute of General Medical Sciences (R01): Inherited Variations in Drug Metabolizing Enzymes. Funding period: 08/2007 – 05/2012; PI: Weinshilboum.

National Institute of General Medical Sciences (U19): Pharmacogenetics of Phase 2 Drug Metabolizing Enzymes—Pharmacogenomic Clinical Study Core. Funding period: 07/2010 – 06/2015; PI: Weinshilboum. Pharmacokinetics and Pharmacodynamics of SSRIs. Funding period: 07/2010 – 06/30/2015; PI: Mrazek.

Minnesota Partnership for Biotechnology and Medical Genomics. Funding Period 1/2011 – 12/2012; PI: Ji.

National Institute of Health: Mayo Clinic KL2 Mentored Career Development Award. Funding period 01/2011 – 12/2012; PI: Ji.

KEY PUBLICATIONS

Abo R, Hebring S, Ji Y, Zhu H, Zeng ZB, Batzler A, Jenkins GD, Biernacka J, Snyder K, Drews M, Fiehn O, Fridley B, Schaid D, Kamatani N, Nakamura Y, Kubo M, Mushiroda T, Kaddurah-Daouk R, Mrazek DA, Weinshilboum RM. Merging pharmacometabolomics with pharmacogenomics using '1000 Genomes' single-nucleotide polymorphism imputation: selective serotonin reuptake inhibitor response pharmacogenomics. *Pharmacogenet Genomics*. 2012; 22(4): 247-253.

Biernacka JM, McElroy SL, Crow S, Sharp A, Benitez J, Veldic M, Kung S, Cunningham JM, Post RM, Mrazek D, Frye MA. Pharmacogenomics of antidepressant-induced mania: a review and meta-analysis of the serotonin transporter gene (5HTTLPR) association. *J Affect Disord*. 2012; 136(1-2): e21-29.

Ellsworth KA, Moon I, Eckloff BW, Fridley BL, Jenkins GD, Batzler A, Biernacka JM, Abo R, Brisbin A, Ji Y, Hebring S, Wieben ED, Mrazek DA, Weinshilboum RM, Wang L. FKBP5 genetic variation: Association with selective serotonin reuptake inhibitor treatment outcomes in major depressive disorder. *Pharmacogenet Genomics*. 2013; 23(3): 156-166.

Hall-Flavin DK, Winner JG, Allen JD, Jordan JJ, Nesheim RS, Snyder KA, Drews MS, Eisterhold LL, Biernacka JM, Mrazek DA. Using a pharmacogenomic algorithm to guide the treatment of depression. *Transl Psychiatry*. 2012; 2: e172.

Ji Y, Biernacka JM, Hebring S, Chai Y, Jenkins GD, Batzler A, Snyder KA, Drews MS, Desta Z, Flockhart D, Mushiroda T, Kubo M, Nakamura Y, Kamatani N, Schaid D, Weinshilboum RM, Mrazek DA. Pharmacogenomics of selective serotonin reuptake inhibitor treatment for major depression: genome-wide associations and functional genomics. *Pharmacogenomics J*. 2012.

Ji Y, Biernacka J, Snyder K, Drews M, Pellemounter LL, Colby C, Wang L, Mrazek DA, Weinshilboum RM. Catechol O-methyltransferase pharmacogenomics and selective serotonin reuptake inhibitor response. *Pharmacogenomics J*. 2012; 12(1): 78-85.

Translational Neuroscience Laboratory

INVESTIGATORS

Susannah J. Tye, PhD, Doo-Sup Choi, PhD, Joanna M. Biernacka PhD, Victor M. Karpyak, MD, PhD, Osama A. Abulseoud, MD, Marin Veldic, MD, Paul E. Croarkin, DO, Shari L. Sutor, Mark A. Frye, MD



*Back: Choi, Tye, Croarkin, Sutor, Frye, Veldic
Front: Abulseoud, Karpyak, Biernacka*

Our Translational Neuroscience Laboratory provides the space and expertise for members of the Department of Psychiatry & Psychology to conduct cutting-edge research in translational neuroscience, genomic psychiatry, and biomarker discovery using the latest cellular, molecular, and genetic technologies. Biomarker discovery has already had an immense impact upon the prevention and treatment of many diseases, but remains in its relative infancy in psychiatry. Our research combines multiple scientific approaches to bring new insight into the causes of psychiatric illness and factors mediating individual treatment outcomes. Our 'bench to bedside' and 'bedside to bench' framework is helping us better understand the interplay between genetic and environmental risk factors so that we can provide more targeted treatments for patients. Recent research projects have focused on defining the role of genetic and environmental factors in depression, bipolar disorder, and alcoholism. In combination with our focused search for biomarkers of treatment response, the outcomes of this research will enable us to individualize patient care and tailor treatments in ways not previously possible. In addition to this, our facility functions as a classroom for trainees and faculty in psychiatry and psychology who are interested in learning how to do preclinical and bench-top research. Several of these individuals have gone on to develop their own research careers in the area of psychiatric genetics.

KEY PUBLICATIONS

Abulseoud OA, Miller JD, Wu J, Choi DS, Holschneider DP. Ceftriaxone upregulates the glutamate transporter in medial prefrontal cortex and blocks reinstatement of methamphetamine seeking in a condition place preference paradigm. *Brain Res*. 2012; 1456: 14-21.

Anderson RJ, Frye MA, Abulseoud OA, Lee KH, McGillivray J, Berk M, Tye SJ. Deep Brain Stimulation for Treatment-Resistant Depression: Efficacy and Mechanisms of Action. *Neurosci Biobehav Rev*. 2012; 36(8): 1920-1933.

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Karpyak VM, Geske JR, Colby CL, Mrazek DA, Biernacka JM. Genetic variability in the NMDA-dependent AMPA trafficking cascade is associated with alcohol dependence. *Addict Biol*. 2012; 17(4): 798-806.

Karpyak VM, Winham SJ, Preuss UW, Zill P, Cunningham JM, Walker DL, Lewis KA, Geske JR, Colby CL, Abulseoud OA, Hall-Flavin DK, Loukianova LL, Schneekloth TD, Frye MA, Bazov I, Heit JA, Bakalkin G, Mrazek DA, Biernacka JM. Association of the PDYN gene with alcohol dependence and the propensity to drink in negative emotional states. *Int J Neuropsychopharmacol*. 2012; 1-11.

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Walker AJ, Burnett SA, Hasebe K, McGillivray JA, Gray L, McGee SL, Walder K, Berk M, Tye SJ. Chronic adrenocorticotrophic hormone treatment alters tricyclic antidepressant efficacy and prefrontal monoamine tissue levels. *Behav Brain Res*. 2013; 242: 76-83.

Drug Discovery



Richelson, Boules

INVESTIGATORS

Mona M. Boules, PhD

Elliott Richelson, MD
(Jacksonville, Florida)

Our laboratory continues drug discovery work aimed toward drugs to treat depression, schizophrenia, drug addiction, and various types of pain. In 2011, our license agreement for our triple reuptake inhibitors (TRIs) with AstaZeneca formally ended. This collaboration led to the joint syntheses of nearly 400 new compounds, all of which have been returned to Mayo Clinic and Virginia Polytechnic Institute and State University (co-inventor location). Only a few of the compounds retain TRI pharmacology, and a few are highly selective dopamine transporter (DAT) blockers. These DAT blockers could be useful in treating disorders other than depression. We are currently in discussions with a pharmaceutical company to license all of these compounds for clinical development. We have published strong evidence to support the use of our neurotensin compounds to treat schizophrenia, psychostimulant abuse, and pain. These compounds are moving forward to a clinical trial for the topical treatment of eye pain by the company that has licensed our peptides (Sarentis Therapeutics, Inc, New York, New York). We remain very excited about the synergy between neurotensin peptides and opioids in the treatment of pain, for which we have two U.S. patents (most recently awarded in 2011). In addition to the research funding listed below, we have a grant application pending with the US Department of Defense on chronic fatigue syndrome.

GRANTS

National Institutes of Health (R03): Effect of Neurotensin Analogs on Protein Phosphorylation in the Mouse Brain. Funding period: 04/2010 – 03/2012; PI: Boules.

Eloracpharma: Comparative binding of cis-DOXEPIN to human histamine H1 receptors. Funding period: 10/2011 – 01/2012; PI: Richelson.

James and Esther King Biomedical Research Program (2KF01): Novel Therapy for nicotine addiction in alcoholics. Funding period: 10/2011 – 03/2013; PI: Boules.

Janssen Pharmaceuticals: Comparison of Risperidone and Paliperidone on Rat Brain Proteome. Funding period: 08/2008 – 11/2012; PI: Richelson.

Siragusa Foundation Career Development Award in Neuroscience Research: The Role of Neurotensin Subtype 2 Receptor in the Development of Tolerance to the Antinociceptive Effects of NT69L. Funding period: 09/2010 – 08/2013; PI: Boules.

State of Florida: Novel Therapy for Nicotine Addiction in Alcoholics State of Florida Department of Health. Funding period: 11/2011 – 10/2012; PI: Boules.

KEY PUBLICATIONS

Richelson E. Multi-modality: A new approach for the treatment of major depressive disorder. *Int J Neuropsychopharmacol.* 2013; 1-10.

Sheeler RD, Ackerman MJ, Richelson E, Nelson TK, Staab JP, Tangalos EG, Dieser LM, Cunningham JL. Considerations on safety concerns about citalopram prescribing. *Mayo Clin Proc.* 2012; 87(11): 1042-1045.

Smith KE, Boules M, Williams K, Richelson E. NTS1 and NTS2 mediate analgesia following neurotensin analog treatment in a mouse model for visceral pain. *Behav Brain Res.* 2012; 232(1): 93-97.

Zhu HJ, Appel DI, Grundemann D, Richelson E, Markowitz JS. Evaluation of organic cation transporter 3 (SLC22A3) inhibition as a potential mechanism of antidepressant action. *Pharmacol Res.* 2012; 65(4): 491-496.

US PATENT ISSUED

Neurotensin Receptor Agonists and Opioid Receptor Agonists. D. Barbut and Elliott Richelson, MD. US Patent No. 8,058,230; 11/15/2011.

Brain Rehabilitation



INVESTIGATORS

Thomas F. Bergquist, PhD, LP
Allen W. Brown, MD

*Back: Kendall, Bergquist, Nieman
Front: Brown, Moessner*

The brain rehabilitation research group is composed of a multidisciplinary team with members from the departments of nursing, physical medicine, rehabilitation, neurology, social services, and psychiatry and psychology. Our center was successfully refunded for a fourth 5-year cycle as a Traumatic Brain Injury Model System (TBIMS), contributing patients to the TBIMS national database and involved in collaborative analyses of this dataset. We are also conducting a first of its kind study to remotely connect individuals hospitalized for TBI, their families, and their local health care providers to specialized brain rehabilitation services using both traditional and customized information and communication technology. Internal collaborators for this study include the Center for Innovation and Center for Social Media. External collaborators include the Departments of Health in Minnesota and Iowa, Sanford Health, and Regional Health. The goal of this study is to test the extent to which a complex brain rehabilitation intervention delivered remotely improves participation outcomes and satisfaction compared to a matched group receiving usual care in their communities. Collaborative research between the Mayo TBIMS Center and other funded centers (a total of 16 nationally) on a wide variety of studies, such as post-traumatic headaches and sexuality after traumatic brain injury, continues. The Mayo Brain Rehabilitation Research group networks with academic institutions and agencies that do similar research including regional Departments of Health, Human Services, and Vocational Rehabilitation; the Brain Injury Alliances of Minnesota and surrounding states, regional VA medical centers.

GRANTS

National Institutes of Health: System to Improve Transportation Access for the Cognitively Impaired. Funding period: 06/2012 – 02/2014.

National Institute on Disability and Rehabilitation Research (NIDRR): Department of Education, Mayo Clinic TBI Model Systems Center. Funding period: 10/2012 – 09/2017; PI: Brown.

Mayo Clinic Department of Psychiatry and Psychology Small Grants Program: A Randomized Controlled Evaluation of a Repetitive Facilitative Exercise Program for Adults With an Established Stroke and Upper Extremity Impairment. Funding period: 10/2011 – 10/2013; Co-Investigator: Brown.

Mayo Clinic Novel Methodology Development Award (Center for Translational Science Activities): Quantitative Evaluation of Muscle Spasticity With Ultrasound for Stroke Patients. Funding period: 08/2011 – 07/2012; Co-PI: Brown.

KEY PUBLICATIONS

Bergquist TF, Micklewright JL, Yutsis M, Smigielski JS, Gehl C, Brown AW. Achievement of client-centered goals by persons with acquired brain injury in comprehensive day treatment is associated with improved functional outcomes. *Brain Inj.* 2012; 26(11): 1307-1314.

Brown AW, Leibson CL, Mandrekar J, Ransom JE, Malec JF. Long-Term Survival after Traumatic Brain Injury: A Population-Based Analysis Controlled for Non-head Trauma. *J Head Trauma Rehabil.* 2013.

Davis LC, Sherer M, Sander AM, Bogner JA, Corrigan JD, Dilkers MP, Hanks RA, Bergquist TF, Seel RT. Pre-injury predictors of life satisfaction at one year after traumatic brain injury. *Arch Phys Med Rehabil.* 2012; 93(8): 1324-1330.

Fordeucey PG, Gluekauf RL, Bergquist TF, Maheu MM, Yutsis M. Telehealth for persons with severe functional disabilities and their caregivers: Facilitating self-care management in the home setting. *Psychol Serv.* 2012; 9(2): 144-162.

Harrison-Felix C, Kreider SE, Arango-Lasprilla JC, Brown AW, Dijkers MP, Hammond FM, Kolakowsky-Hayner SA, Hirshson C, Whiteneck G, Zasler ND. Life Expectancy Following Rehabilitation: A NIDRR Traumatic Brain Injury Model Systems Study. *J Head Trauma Rehabil.* 2012; 27(6): 69-80.

Leibson CL, Brown AW, Hall Long K, Ransom JE, Mandrekar J, Osler TM, Malec JF. Medical care costs associated with traumatic brain injury over the full spectrum of disease: a controlled population-based study. *J Neurotrauma.* 2012; 29(11): 2038-2049.

Walker WC, Marwitz JH, Wilk AR, Ketchum JM, Hoffman JM, Brown AW, Lucas S. Prediction of headache severity (density and functional impact) after traumatic brain injury: A longitudinal multicenter study. *Cephalgia.* 2013.

Yutsis M, Bergquist T, Micklewright J, Gehl C, Smigielski J, Brown AW. Pre-treatment compensation use is a stronger correlate of measures of activity limitations than cognitive impairment. *Brain Inj.* 2012; 26(11): 1297-1306.

Deep Brain Stimulation

INVESTIGATORS

Osama A. Abulseoud, MD, Susannah J. Tye, PhD, Mark A. Frye, MD, Jarrett W. Richardson, MD, Shirlene M. Sampson, MD, Glenn E. Smith, PhD, LP, Christopher A. Wall, MD, Andrea C. Adams, MD, Kendall H. Lee, MD, PhD, Joseph Y. Matsumoto, MD, Paola Sandroni, MD, PhD, Squire (Matt) M. Stead, MD, PhD



Back: Lee, Gorman, Adams, Matsumoto, Klassen, Fields, Smith
Front: Frye, Sampson, Stead

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 (OCD), and Tourette syndrome. This highly collaborative clinical research group focuses its efforts on identifying potential mechanisms of action (e.g., neural circuitry, neurotransmission, synaptic plasticity) of DBS, given the favorable neuropsychologic and psychiatric clinical outcomes observed among patients with Parkinson disease. Drs. Abulseoud and Frye are currently recruiting patients with severe obsessive compulsive disorder for a clinical trial testing the efficacy of deep brain stimulation in treating severe cases of refractory OCD symptoms.

GRANTS

National Institute of Neurological Disorders and Stroke: Mechanism of Action of Deep Brain Stimulation. Funding period: 07/2008 – 06/2013; PI: Lee.

Mayo Clinic Center for Translational Science Activities KL2 Mentored Career Development Award: Preclinical Glutamate Modulation Through Deep Brain Stimulation as a Novel Target for Alcohol Addiction. Funding period: 07/2011 – 06/2014; PI: Abulseoud.

Mayo Clinic Discovery Translational Grant; Development of implantable wireless instantaneous neurotransmitter concentration sensor system (i-WINCS) for human use. Funding period: 02/2010 – 02/2012; PI: Lee.

KEY PUBLICATIONS

Abulseoud O, Gitlin M, Altshuler L, Frye M. Baseline Thyroid Indices and the Subsequent Response to Citalopram Treatment, a Pilot Study Brain and Behavior Brain and Behavior.

Anderson RJ, Frye MA, Abulseoud OA, Lee KH, McGillivray JA, Berk M, Tye SJ. Deep brain stimulation for treatment-resistant depression: Efficacy, safety, and mechanisms of action. *Neurosci Biobehav Rev.* 2012; 36(8): 1920-1933.

Chopra A, Tye SJ, Lee KH, Matsumoto J, Klassen B, Adams AC, Stead M, Sampson S, Kall BA, Frye MA. Voltage-dependent mania status-post subthalamic nucleus deep brain stimulation in Parkinson's disease. *Biol Psychiatry.* 2011; 70(2): e5-7.

Chopra A, Tye SJ, Lee KH, Sampson S, Matsumoto J, Adams A, Klassen B, Stead M, Fields JA, Frye MA. Underlying neurobiology and clinical correlates of manic status after subthalamic nucleus deep brain stimulation in Parkinson's Disease: A review of the literature. *J Neuropsychiatry Clin Neurosci.* 2012; 24(1): 102-110.

Kim JP, Min HK, Knight E, Abulseoud OA, Marsh MP, Kelsey K, Duffy PS, Blaha C, Bennet KE, Frye MA, Lee KH. Centromedian-Parafascicular Deep Brain Stimulation Modulates Motor, Associative, and Limbic circuits: 3T fMRI Study in Large Animal Biological Psychiatry. 2013.

Knight E, Min HK, Hwang SC, Marsh M, Kim I, Felmlee J, Abulseoud OA, Frye MA, Lee KH. Insular and Prefrontal Cortical Activation During Nucleus Accumbens High Frequency Stimulation in a Large Animal Model: a functional MRI study. *PLOS ONE.*



Pain Rehabilitation Center



Townsend, Bruce, Weiss, Harrison

INVESTIGATORS

Barbara K. Bruce, PhD, LP
Tracy E. Harrison, MD,
Teresa A. Rummans, MD
Cynthia O. Townsend, PhD, LP
Karen E. Weiss, PhD, LP

The ongoing research activities of the Adult Pain Rehabilitation Center (PRC) and the Pediatric Pain Rehabilitation Center (PPRC) focus on the clinical outcomes of these unique multidisciplinary pain rehabilitation programs. Studies evaluating the impact of the program on functional disability and psychological distress, including depression and pain catastrophizing, as well as anxiety in adolescents with pain, are ongoing. In particular, studies on the effectiveness of pain rehabilitation in adolescents with postural orthostatic tachycardia syndrome, the effects of acceptance on important outcome variables, and the role of vitamin D and inattention in pain are targets of ongoing research. Studies are ongoing that evaluate the contribution of parenting style on functioning in pediatric pain patients. The development of a Biobank for adolescents with chronic pain is in progress in collaboration with the Department of Pediatrics.

GRANT

NARCH Initiative. Funding period: 09/2010 – 08/2014; PI: Hooten;
Co-investigator: Townsend.

Hooten WM, Knight-Brown M, Townsend CO, Lares HJ. Clinical outcomes of multidisciplinary pain rehabilitation among African American compared with Caucasian patients with chronic pain. *Pain Med.* 2012; 13(11): 1499-1508.

KEY PUBLICATIONS

Cunningham JL, Hayes SE, Townsend CO, Lares HJ, Hooten WM. Associations between spousal or significant other solicitous responses and opioid dose in patients with chronic pain. *Pain Med.* 2012; 13(8): 1034-1039.

Hooten WM, Qu W, Townsend CO, Judd JW. Effects of strength vs aerobic exercise on pain severity in adults with fibromyalgia: a randomized equivalence trial. *Pain.* 2012; 153(4): 915-923.

Groenewald CB, Rabbitts JA, Schroeder DR, Harrison TE. Prevalence of moderate-severe pain in hospitalized children. *Pediatr Anesth.* 2012; 22(7): 661-668.

Kizilbash S, Harrison T, Wilder R, Driscoll S, Bruce B, Fischer P. Persistent Pediatric Pain: New Paradigms, Improved Prognoses. *Pain Management.* 2012; 5(1/02): 12-18.

Oh TH, Hosking TL, Luedtke CA, Weingarten TN, Vincent A, Kim CH, Thompson JM. Predictors of clinical outcome in fibromyalgia after a brief interdisciplinary fibromyalgia treatment program: Single center experience. *PM R*. 2012; 4(4): 257-263.

Parsaik AK, Lapid MI, Rummans TA, Cha RH, Boeve BF, Pankratz VS, Tangalos EG, Petersen RC. ApoE and quality of life in nonagenarians. *J Am Med Dir Assoc*. 2012; 13(8): 704-707.

Wallace DP, Sim LA, Harrison TE, Bruce BK, Harbeck-Weber C. Covert video monitoring in the assessment of medically unexplained symptoms in children. *J Pediatr Psychol*. 2012; 37(3): 329-337.

PRESENTATIONS

Antiel RM, Keating EM, Weiss KE, Wallace DP, Fischer PR, Harbeck-Weber C. Parental response to pain: the impact on functional disability, depression, anxiety, and pain acceptance in adolescents with chronic pain and orthostatic intolerance. *International Symposium on the Autonomic Nervous System*. 2012.

Bruce BK, Harrison TE, Bee SM, Luedtke CA, Dresher ER, Hansen DL, Shappell AL, Petersen MA, Ryan SM, Weiss, KE. Improved psychological distress and functioning in adolescents with chronic pain. *Society of Behavioral Medicine Annual Meeting & Scientific Sessions*. 2012.

Bruce BK, Harrison TE, Weiss KE, Fischer PR, Ahrens SP, Timm WN. Preliminary data on the durability of improved symptoms, functioning, and psychological distress in adolescents with POTS treated in a multidisciplinary treatment program. *International Symposium on the Autonomic Nervous System*. 2012.

Bruce BK, Harrison TE, Weiss KE, Rummans TA. Functional restoration as an adjunct to pharmacotherapy in the treatment of postural orthostatic tachycardia syndrome. *International College of Neuropsychopharmacology Meeting*. 2012.

Bruce BK, Hayes SE, Allman DA, Harrison TE, Weiss KE, Porter C. The effectiveness of a multidisciplinary pain rehabilitation program in the treatment of Postural Orthostatic Tachycardia Syndrome in adolescents. *Society of Behavioral Medicine Annual Meeting & Scientific Sessions*. 2012.

Cronin J, Luedtke C, Nash V, Pestka E, Townsend C. Tips for Taming the Beast: Lessons Learned Working with Substance Use Disorders & Chronic Pain. *American Society for Pain Management Nursing*. 2012.

Dresher E, Shappell A, Luedtke C, Bruce B, Harrison T, Bee S. School Reintegration: Nursing Role in Channeling Rough Waters for the Pediatric Chronic Pain Patient. *American Society for Pain Management Nursing*. 2012.

Harrison TE, Bruce BK, Weiss KE, Rummans, TA. Vitamin D Levels in Pediatric Patients with Chronic Non-Malignant Pain. *International College of Neuropsychopharmacology Meeting*. 2012.

Oviedo AM, Richins J, Weingarten TN, Harrison TE. Pain Management in a Pediatric Patient with Guillain-Barre Undergoing Extensive Lower Extremity Orthopedic Surgery. *International Assembly for Pediatric Anesthesia (IAPA)*. 2012.

Wallace DP, McCracken LM, Weiss KE, Harbeck-Weber C. The Parent Psychological Flexibility Questionnaire and adolescent chronic pain: factor analysis and comparison of mothers and fathers. *American Pain Society Annual Conference*. 2012.

Weiss KE, Garness B, Wallace DP, Harbeck-Weber C. The parent response to pain questionnaire – Revised: Factor analysis and comparison of mothers and fathers. *National Conference in Clinical Child and Adolescent Psychology: Translating Research into Practice*. 2012.

Weiss KE, Harbeck-Weber C, Zaccariello M, Bruce B, Harrison T. Attention and executive functioning in pediatric pain patients. *Annual World Congress on Pain*. 2012.

Patient Education Research Program



Vickers Douglas and Hathaway

INVESTIGATORS

Kristin S. Vickers Douglas, PhD, LP
Julie C. Hathaway

For the last ten years, Kristin Vickers Douglas, Ph.D., ABPP, has directed the Patient Education Research Program in collaboration with Julie Hathaway, research program coordinator. The overarching goal of this research program is to advance the science and practice of patient education and to improve patient self-management of chronic medical conditions. This research program provides research consultation, intervention development, behavioral interventionist training, and qualitative research design and analysis to investigators throughout Mayo Clinic interested in patient education and health behavior change. Dr. Vickers Douglas holds a joint appointment in Mayo Clinic Health Care Policy and Research, providing additional collaborative opportunities.

GRANTS

National Cancer Institute: Decision Aid for Cigarette Smokers Undergoing Surgery. Funding period 07/2010 – 06/2013.

National Cancer Institute: Pulmonary Rehabilitation before Lung Resection. Funding period 03/2012 – 02/2017.

National Heart, Lung and Blood Institute: Multicomponent Intervention to Decrease COPD-Related Hospitalizations. Funding period: 12/2009 – 11/2014.

National Institute on Aging: Technologies for Maintenance of Independent Living in Heart Failure Patients. Funding period: 08/2012 – 07/2017.

National Institute of Health: Interactions between Obesity Risk and Insufficient Sleep. Funding period: 07/2012 – 04/2017.

National Institute of Health Relief Grant: Supervised, Vigorous, Intensity Exercise Intervention for Depressed Female Smokers. Funding period: 12/2011 – 11/2013.

Flight Attendant Medical Research Institute Clinical Innovator Award: Reducing Smoke Exposure in Children Facing Surgery. Funding period: 07/2009 – 06/2013.

KEY PUBLICATIONS

Benzo RP, Vickers KS, Ernst DB, Tucker SJ, McEvoy CE, Lorig K. Development and feasibility of a COPD self-management intervention delivered with motivational interviewing strategies. *J Cardiopulm Rehabil Prev.* 2013; 33(2): 113-123.

Collins NM, Vickers KS, Hathaway JC, Croghan IT, Pruthi S. Improving breast cancer knowledge: The use of a computerized breast cancer education tool during a clinical consultation with a breast specialist. *Breast J.*

DeJesus RS, Vickers KS, Howell LA, Stroebel RJ. Qualities of care managers in chronic disease management: patients and providers' expectations. *Prim Care Diabetes.* 2012; 6(3): 235-239.

Howell LA, Clark SM, Dierkhising RA, Thomas RJ, Vickers KS. Predicting Patient Expectations about Survival Following Cardiac Events. *Am J Health Behav.*

Jumean MF, Korenfeld Y, Somers VK, Vickers KS, Thomas RJ, Lopez-Jimenez F. Impact of diagnosing metabolic syndrome on risk perception. *Am J Health Behav.* 2012; 36(4): 522-532.

Pecina JL, Vickers KS, Finnie DM, Hathaway JC, Takahashi PY, Hanson GJ. Health care providers style may impact acceptance of telemonitoring. *Home Health Care Management and Practice.* 2012; 24(6): 276-282.

Vickers KS. Self-management education approach: engaging patients in creating a personal and relevant action plan (part 1) I keep telling patients what to do, so why don't they make progress? *J Ren Nutr.* 2012; 22(6): e51-53.

Vickers KS. Self-management education approach: engaging patients in creating a personal and relevant action plan (part 2): I keep telling patients what to do, so why don't they make progress? *J Ren Nutr.* 2013; 23(1).

Behavioral Health Research Program



INVESTIGATORS

Christi A. Patten, PhD, Shawna L. Ehlers, PhD, LP

*Back: Bronars, Hughes, Decker, Patten, Hanza
Front: Brockman, Smith, Bierbaum*

Dr. Patten, Professor of Psychology and a career scientist, directs the Behavioral Health Research Program located in the Mayo Clinic Cancer Center. Her research team focuses on developing novel, theory-based behavioral interventions for tobacco cessation targeting Alaska Natives, pregnant women, adolescents, smokers with psychiatric comorbidity, and the social network of smokers. In a large, randomized trial funded by ClearWay Minnesota and enrolling 534 nonsmokers (i.e., support persons), the research team observed that a telephone intervention was effective for promoting smoker use of the state-funded Quitline. A subsequent large-scale effectiveness trial funded by ClearWay Minnesota and enrolling 1,020 nonsmokers is underway.

The investigators also have a commitment to reducing cancer health disparities among Native Americans. During the past 12 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 a research infrastructure and to develop evidence-based programs to reduce tobacco-related health disparities among Alaska Native people. Community research priorities are focused on reducing tobacco use among pregnant women and youth. This work currently is funded through an R01 grant from the National Institute on Drug Abuse entitled "Tobacco Cessation Treatment for Alaska Native Youth" and an R01-level, 5-year project entitled "Biomarker Feedback to Motivate Tobacco Cessation Among Alaska Native Pregnant Women," funded by the National Cancer Institute (NCI) as part of a U54 Community Networks Program grant. Dr. Patten is also the Research Core Director of the U54 grant. In addition, with funding of an R21 grant through the NCI, a study is underway to develop and test a family-based intervention to promote mammography screening among Navajo women.

GRANTS

National Cancer Institute: Biomarker Feedback to Motivate Tobacco Cessation in Pregnant Alaska Native Women. Funding period: 09/2010 – 08/2015; Co-Investigator: Patten.

National Cancer Institute: Family Cancer Experience and Colorectal Cancer Prevention. Funding period: 08/2009 – 07/2011; PI: Sinicrope.

National Cancer Institute: Family Cancer Literacy to Promote Mammography Screening Among Navajo Women. Funding period: 09/2010 – 09/2012; PI: Patten.

National Institute on Drug Abuse: Tobacco Cessation Treatment for Alaska Native Youth. Funding period: 04/2009 – 03/2012; PI: Patten.

ClearWay Minnesota: Support Person Effectiveness Study to Promote Smoker Utilization of the QUITPLAN Helpline. Funding period: 01/2011 – 12/2013; PI: Patten.

KEY PUBLICATIONS

Brockman TA, Patten CA, Smith CM, Hughes CA, Sinicrope PS, Bonnema SM, Decker PA. Process of counseling support persons to promote smoker treatment utilization. *Addiction, Research & Theory*. 2012; 20(6): 466-479.

Catley D, Harris KJ, Goggin K, Richter K, Williams K, Patten C, Resnicow K, Ellerbeck E, Bradley-Ewing A, Malomo D, Liston R. Motivational interviewing for encouraging quit attempts among unmotivated smokers; Study protocol of a randomized, controlled, efficacy trial. *BMC Public Health*. 2012; 12:456.

Hughes CA, Bauer MC, Horazdovsky BF, Garrison ER, Patten CA, Petersen WO, Bowman CN, Vierkant RA. Development and pilot evaluation of Native CREST – a cancer research experience and student and student training program for Navajo undergraduate students. *J Cancer Education*. 2012.

Patten CA. Tobacco cessation intervention during pregnancy among Alaska Native Women. *J Cancer Education*. 2012; (27 Suppl 1): 86-90.

Patten CA, Fadahunsi O, Hanza M, Smith C, Hughes C, Brockman T, Parker R, Decker P, Luger E, Sinicrope P, Offord K. Development of a tobacco cessation intervention for Alaska Native Youth. *Addiction, Research & Theory*. 2012.

Breitkopf CR, Sinicrope PS, Rabe KG, Brockman TA, Patten CA, McWilliams RR, Ehlers S, Petersen GM. Factors influencing receptivity to future screening options for pancreatic cancer in those with and without pancreatic cancer family history. *Hered Cancer Clin Pract*. 2012; 10(1): 8.

Rausch SM, Gonzalez BD, Clark MM, Patten C, Felton S, Liu H, Li Y, Sloan J, Yang P. SNPs in PTGS2 and LTA predict pain and quality of life in long term lung cancer survivors. *Lung Cancer*. 2012; 77(1): 217-223.

Renner CC, Lanier AP, Lingren B, Jensen J, Patten CA, Parascandola M, Benowitz NL, Tyndale RF, Hatsukami DK. Tobacco use among southwestern Alaska Native people. *Nicotine Tob Res*. 2013; 15(2): 401-406.

Sinicrope PS, Goode EL, Limburg PJ, Vernon SW, Wick JB, Patten CA, Decker PA, Hanson AC, Smith CM, Beebe TJ, Sinicrope FA, Lindor NM, Brockman TA, Melton LJ 3rd, Petersen GM. A population-based study of prevalence and adherence trends in average risk colorectal cancer screening, 1997-2008. *Cancer Epidemiol, Biomarkers Prev*. 2012; 21(2): 347-350.

Solberg Nes L, Liu H, Patten CA, Rausch SM, Sloan JA, Garces YI, Cheville AL, Yang P, Clark MM. Physical activity level and quality of life in long term lung cancer survivors. *Lung Cancer*. 2012; 77(3): 611-616.

AWARDS & LEADERSHIP ROLES

Shawna L. Ehlers, PhD, Chair, Society of Behavioral Medicine Mentorship Subcommittee.

Christi A. Patten, PhD, Former Study Section Member, National Institute on Drug Abuse Treatment Research Subcommittee (NIDA-E).

Shawna L. Ehlers, PhD, Founding Member, Society of Behavioral Medicine Consultation Program.

Christi A. Patten, PhD, Panel Expert, National Institutes of Health for tobacco cessation and reducing cancer health disparities.

Christi A. Patten, PhD, Assistant Editor, *Addiction*.

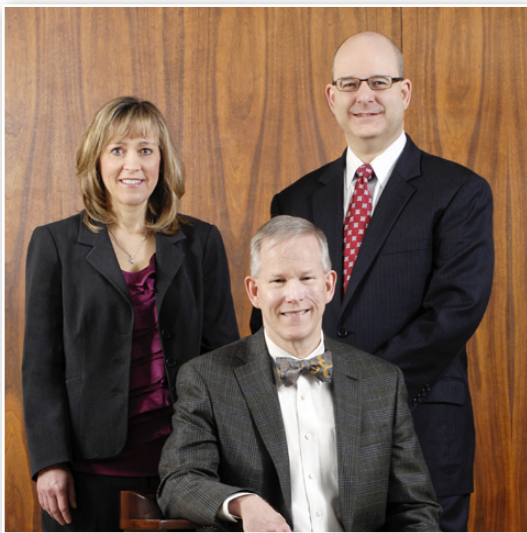
Christi A. Patten, PhD, Standing Study Section Member, National Institutes of Health Risk, Intervention, and Prevention in the Addictions.

Psychosomatic Research Group/Behavioral Medicine Program

INVESTIGATORS

Jeffrey P. Staab, MD, Richard J. Seime, PhD, LP, Cynthia Harbeck-Weber, PhD, LP, Erin L. Sterenson, MD, Jennifer M. Craft, PhD, LP (Rochester, Minnesota)

Cynthia M. Stonnington, MD, Kari A. Martin, MD, Lois E. Krahn, MD (Scottsdale, Arizona)



Harbeck-Weber, Seime, Staab



Krahn, Stonnington

The Psychosomatic Research Group investigates problems at the interface between medical and psychiatric illnesses. Topics include somatic symptom disorders (e.g., behavioral spells, chronic dizziness, functional gastrointestinal tract disorders, functional movement disorders); health anxiety, depression, and anxiety in medically ill patients; predictors of disability and health care utilization.

Pediatric-focused topics include assessment and predictors of functioning for adolescent patients with chronic pain, autonomic dysfunction, and other somatic symptom disorders, with future projects to include evaluation of behavioral intervention for rumination syndrome.

GRANTS

Meniere's Society of the UK: The Role of Acceptance in Adjustment to Meniere's Disease. Funding period: 09/2012 – 08/2013; Co-Investigator: Staab.

Mayo Clinic Center for Translational Science Activities (CR-20 Award): Guided Self-Help for Functional Neurological Symptoms: A Randomized Controlled Efficacy Trial. Funding period: 12/2011 – 12/2013; PI: Martin.

Mayo Clinic Center for Translational Science Activities (CR-5 Award): Oral Ketamine in the Treatment of Depression and Anxiety in Palliative Care Cancer Patients. Funding period: 12/2011 – 12/2013; PI: Bright.

Mayo Clinic Center for Translational Science Activities (CPI-10 Award): A Resilience Intervention Involving Mindfulness Training for Transplant Patients and their Caregivers. Funding Period 06/2012 – 05/2013; PI: Stonnington.

Mayo Clinic Scholarly Opportunity Award: Pharmacologic Dissection of Vestibular Migraine and Chronic Subjective Dizziness. Funding period: 04/2012 – 03/2014; PI: Staab.

KEY PUBLICATIONS

Angstman KB, Rasmussen NH, Maclaughlin KL, Staab JP. Inter-relationship of the functional status question of the PHQ-9 and depression remission after six months of collaborative care management. *J Psychiatr Res.* 2013; 47(3): 418-422.

Bravo TP, Hoffman-Snyder CR, Wellik KE, Martin KA, Hoerth MT, Demaerschalk BM, Wingerchuk DM. The effect of selective serotonin reuptake inhibitors on the frequency of psychogenic nonepileptic seizures: a critically appraised topic. *Neurologist.* 2013; 19(1): 30-33.

Czarnecki K, Thompson JM, Seime R, Geda YE, Duffy JR, Ahlskog JE. Functional movement disorders: Successful treatment with a physical therapy rehabilitation protocol. *Parkinsonism Relat Disord.* 2012; 18(3): 247-251.

Honaker JA, Gilbert JM, Shepard NT, Blum DJ, Staab JP. Adverse effects of health anxiety on management of a patient with benign paroxysmal positional vertigo, vestibular migraine, and chronic subjective dizziness. *Am J Otolaryngology.*

Neff BA, Staab JP, Eggers SD, Carlson ML, Schmitt WR, Van Abel KM, Worthington DK, Beatty CW, Driscoll CL, Shepard NT. Auditory and vestibular symptoms and chronic subjective dizziness in patients with Meniere's disease, vestibular migraine, and Meniere's disease with concomitant vestibular migraine. *Otol Neurotol.* 2012; 33(7): 1235-1244.

Noe KH, Grade M, Stonnington CM, Driver-Dunckley E, Locke DE. Confirming psychogenic nonepileptic seizures with video-EEG: sex matters. *Epilepsy Behav.* 2012; 23(3): 220-223.

Sheeler RD, Ackerman MJ, Richelson E, Nelson TK, Staab JP, Tangelos EG, Dieser LM, Cunningham JL. Considerations on safety concerns about citalopram prescribing. *Mayo Clin Proc.* 2012; 87(11): 1042-1045.

Staab JP. Chronic subjective dizziness. *Continuum (Minneapolis).* 2012; 18(5): 1118-1141.

Stonnington CM, Driver-Dunckley ED, Noe KH, Locke DEC. Update: Conversion and somatization disorders. *BMJ Best Practice.* 2012.

AWARDS & LEADERSHIP ROLES

Richard J. Seime, PhD, President, American Board of Clinical Health Psychology.

Jeffrey P. Staab, MD, Visiting Professor Award, Academy of Psychosomatic Medicine.

Cancer

INVESTIGATORS

Matthew M. Clark, PhD, LP, Simon Kung, MD, Maria I. Lapid, MD,
Jarrett W. Richardson, MD, Teresa A. Rummans, MD (Rochester, Minnesota)

Steven C. Ames, PhD (Jacksonville, Florida)



Rummans, Ames



Lapid, Richardson, Clark

The primary goal of the cancer research team is to improve the quality of life for cancer patients and their caregivers by first assessing and treating psychiatric difficulties and then teaching skills for coping with cancer. This multidisciplinary research team spans the Jacksonville, Florida, and Rochester, Minnesota, Mayo Clinic campuses. The team is involved in several externally funded research projects that seek to identify the predictors of quality of life for cancer survivors or that evaluate tailored multidisciplinary interventions designed to improve the quality of life of cancer survivors and their caregivers.

GRANTS

National Cancer Center: ACOSOG Community Clinical Oncology Program (CCOP) Research Base. Funding period: 08/2011 – 08/2016; Co-investigators: Clark, Lapid, Rummans.

National Cancer Institute: Health and Quality of Life among Long-Term Lung Cancer Survivors. Funding period: 07/2006 – 11/2014; PI: Co-Investigator: Clark.

Linse Bock Foundation: Improving Quality of Life of Cancer Caregivers: An Internet Based Intervention. Funding period: 01/2012 – 12/2014; Co-PIs: Lapid, Clark, Rummans.

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 – 02/2014; Co-PIs: Clark, Rummans.

Pfizer, Inc.: A phase 4, non-treatment follow-up for cardiac assessments following use of smoking cessation treatments in subjects with and without a history of psychiatric disorders. Funding period: 10/2012 – 12/2017; PI: Ames.

Pfizer, Inc.: A phase 4, randomized, double-blind, active and placebo-controlled, multicenter study evaluating the neuropsychiatric safety and efficacy of 12 weeks varenicline tartrate 1 mg BID for smoking cessation in subjects with and without a history of psychiatric disorders. Funding period: 12/2011 – 12/2016; PI: Ames.

St. Mary's Hospital Sponsorship Board: Cancer Caregiving Preference on Technology-Based Caregiving Tools: A Survey Study. Funding period: 07/2012 – 12/2013; PI: Lapid, Co-PIs: Clark, Rummans.

KEY PUBLICATIONS

Clark MM, Atherton PJ, Lapid MI, Rausch SM, Frost MH, Cheville AL, Hanson JM, Garces YI, Brown PD, Sloan JA, Richardson JW, Piderman KM, Rummans TA. Cancer caregiver fatigue: A high level of symptom burden. *Am J Hosp Palliat Care*. 2013.

Clark MM, Rummans TA, Atherton PJ, Cheville AL, Johnson ME, Frost MH, Miller JJ, Sloan JA, Graszer KM, Haas JG, Hanson JM, Garces YI, Piderman KM, Lapid MI, Netzel PJ, Brown PD. Randomized controlled trial of maintaining quality of life during radiotherapy for advanced cancer. *Cancer*. 2013; 119(4): 880-887.

Lapid MI, Kung S, Atherton PJ, Cheville AL, McNiven M, Sloan JA, Clark MM, Rummans TA. Does gender influence outcomes from a multidisciplinary intervention for quality of life designed for patients with advanced cancer? *Support Care Cancer*.

Rausch SM, Gonzalez BD, Clark MM, Patten C, Felten S, Liu H, Li Y, Sloan JA, Yang P. SNPs in PTGS2 and LTA predict pain and quality of life in long term lung cancer survivors. *Lung Cancer*. 2012; 77(1): 217-223.

Rausch SM, Millay S, Scott C, Pruthi S, Clark MM, Patten C, Stan D, Sellers T, Vachon C. Health behaviors among cancer survivors receiving screening mammography. *Am J Clin Oncol*. 2012; 35(1): 22-31.

Sloan JA, Zhao X, Novotny PJ, Wampfler J, Garces YI, Clark MM, Yang P. The relationship between deficits in overall quality of life and non-small cell lung cancer survival. *J Clin Oncol*. 2012; 30(13): 1498- 1504.

Yang P, Cheville AL, Wampfler JA, Garces YI, Jatoi A, Clark MM, Cassivi SD, Midthun DE, Marks RS, Aubry MC, Okuno SH, Williams BA, Nichols FC, Trastek VF, Sugimura H, Sarna L, Allen MS, Deschamps C, Sloan JA. Quality of life and symptom burden among long-term lung cancer survivors. *J Thorac Oncol*. 2012; 7(1): 64-70.

Sloan JA, de Andrade M, Decker P, Wampfler J, Oswald C, Clark MM, Yang P. Genetic variations and patient-reported quality of life among patients with lung cancer. *J Clin Oncol*, 2012; 30(14): 1699-1704.

Solberg Nes L, Liu H, Patten CA, Rausch SM, Sloan JA, Garces YI, Cheville AL, Yang P, Clark MM. Physical activity level and quality of life in long term lung cancer survivors. *Lung Cancer*. 2012; 77(3): 611-616.

Tavarides AM, Ames SC, Diehl NN, Joseph RW, Castle EP, Thiel DD, Broderick GA, Parker AS. Evaluation of the association of prostate cancer-specific anxiety with sexual function, depression and cancer aggressiveness in men 1 year following surgical treatment for localized prostate cancer. *Psycho-oncology*. 2012.

Neuropsychology, Aging, and Cognition



*Back: Nagle, Stonnington, Hentz, Caselli, Woodruff, Geda
Seated: Johnson, Hoffman Snyder, Locke, Henslin*



Zaccariello, Brown



Smith, Ivnik, and Machulda



Pedraza, Ferman, and Lucas

ADULT INVESTIGATORS

Thomas F. Bergquist, PhD, LP, Julie A. Fields, PhD, LP, Robert J. Ivnik, PhD, LP, Mary M. Machulda, PhD, LP, Daniel E. Rohe, PhD, LP, Jeffrey S. Smigielski, PhD, LP, Glenn E. Smith, PhD, LP, Max R. Trenerry, PhD, LP (Rochester, Minnesota)

Tanis J. Ferman, PhD, Melanie C. Greenaway, PhD, John A. Lucas, PhD, Otto Pedraza, PhD, Beth K. Rush, PhD (Jacksonville, Florida)

Kristin A. Kirlin, PhD, Dona E. Locke, PhD, David Osborne, PhD (Scottsdale, Arizona)

PEDIATRIC INVESTIGATORS

Tanya M. Brown, PhD, LP, Michael J. Zaccariello, PhD, LP (Rochester, Minnesota)

The aging and cognition research group focuses on the early detection and treatment of dementing illness. Major aging and dementia projects are ongoing at all three Mayo Clinic campuses. These projects include research that has promulgated the concept of mild cognitive impairment (MCI) as a pre-dementia risk state for all dementias, including Alzheimer disease and Lewy body dementia. The group has developed clinical tools, neuropsychological norms (including African American norms), and functional neuroimaging strategies that aid in identifying cognitive, clinical, and sleep profiles to assist in early detection of dementing diseases. Group members engage in studies regarding behavioral interventions that can mitigate normal cognitive aging and compensate for the deficits present in MCI. Similarly, rehabilitation psychologists examine improvement in functional outcomes for individuals with acquired brain injury who participate in a comprehensive day treatment program. Additional studies investigate cognitive and behavioral impairments associated with amyotrophic lateral sclerosis as well as genetic risk of Alzheimer disease and the association of caloric intake, physical exercise, and cognitively stimulating activities with cognitive aging and MCI. This group collaborates with colleagues in behavioral neurology, neuropsychiatry, neuroimaging, neuropathology, molecular biology, and pharmacology and with other investigators at Mayo Clinic and other institutions. The Mayo Clinic Study of Aging, the Alzheimer's Disease Research Center, the TBI Model Systems, and the Centers of Excellence for Parkinson's Disease are among Mayo Clinic's multidisciplinary and translational research program.

The pediatric investigators are focused on developing 1) Evidenced-based approaches to neuropsychological assessment, 2) Algorithms that reliably assess change across time, and 3) Effective interventions for children and adolescents who have had a traumatic brain injury. They are also exploring cognition in Niemann-Pick Disease, multiple sclerosis, and the neurodevelopment of children exposed to anesthesia.

GRANTS

National Institutes of Health: LOAD Candidate Genes and Cognitive Endophenotypes among African American Adults. Funding period: 05/2011 – 04/2012; PI: Pedraza.

National Institutes of Health: Neurodevelopment of Children Exposed to Anesthesia: A Population-Based Assessment. Funding period: 04/2012 - 03/2017; Co-Investigator: Zaccariello.

National Institutes of Health Office of Women's Health; Interdisciplinary Women's Health Research Program K12 Program; Mild Cognitive Impairment Caregiver Self-Efficacy. Funding period: 01/2011 – 01/2013; PI: Fields.

Avanir Pharmaceuticals: impact of Nuedexta on the cognitive and behavioral impairments associated with amyotrophic lateral sclerosis (ALS). Funding period: 2001 – 2013; PI: Rush.

Mangurian Fund for Dementia with Lewy bodies. Funding period: 02/2011 – 01/2015; Co-Investigator: Ferman.

National Institute on Aging: AChE, ChaT, & Cholinergic Neurons in Aging and AD. Funding period: 09/2007 - 05/2013; Co-Investigator: Lucas.

National Institute on Aging: Core B: ADCC Clinical Core in: Alzheimer's Disease Core Center, Cores A, B and C. Funding period: 08/2011 - 06/2016; Co-Investigator: Locke.

National Institute on Aging: Mayo Clinic Alzheimer's Disease Research Center. Funding period: 05/2004 – 04/2014; Co-PI: Smith; Co-Investigators: Ferman, Fields, Ivnik, Lucas, Machulda.

National Institute on Aging: Mayo Clinic Olmsted Study of Aging. Funding period: 09/1987 – 01/2014; Co-Investigators: Fields, Ivnik, Machulda.

National Institute on Aging: A Multicenter Rehabilitation Intervention for Amnesic Mild Cognitive Impairment. Funding period: 05/2010 - 04/2013; PIs: Greenaway, Locke, Smith.

National Institute on Aging: Project 2 - Estrogenic effects on imaging markers of cognitive health in: Sex-specific Risk for Vascular Dysfunction and Cognitive Decline. Funding period: 09/2012 - 08/2017; Co-Investigator: Smith.

National Institute on Deafness and Other Communication Disorders: PIB PET Scanning in Speech and Language Based Dementias. Funding period: 02/2010 - 01/2015; Co-Investigator: Machulda.

National Institute on Disability and Rehabilitation Research: Department of Education, Mayo Clinic TBI Model Systems Center. Funding period: 10/2012 - 09/2017; Co-Investigator: Bergquist.

National Institute of Neurological Disorders and Stroke: LDN: Niemann-Pick Disease, Type C in: LDN: Longitudinal Study of Cognition in Subjects with Niemann-Pick Disease, Type C. Funding period: 09/2009 - 08/2014; Co-Investigators: Brown, Zaccariello.

National Multiple Sclerosis Society: Non-Ambulatory Impairment in Benign Multiple Sclerosis. Funding period: 09/2006 - 08/2012; Co-Investigator: Rohe.

Neuropace: Responsive Neurostimulator (RNS) System Pivotal-A Clinical Investigation. Funding period: 08/2006 - 06/2013; Co-Investigator: Trenerry.

SGP - Small Grants Program: Effects of genetic variability in prodynorphin and kappa-opioid receptor genes on cognitive performance and treatment outcome in alcohol dependent subjects. Funding period: 10/2011 - 10/2013; PI: Smigielski.

KEY PUBLICATIONS

Bergquist TF, Micklewright JL, Yutsis M, Smigielski JS, Gehl C, Brown AW. Achievement of client-centered goals by persons with acquired brain injury in comprehensive day treatment is associated with improved functional outcomes. *Brain Injury*. 2012; 26(11): 1307-1314.

Boeve BF, Boylan KB, Graff-Radford NR, DeJesus-Hernandez M, Knopman DS, Pedraza O, Vemuri P, Jones D, Lowe V, Murray ME, Dickson DW, Josephs KA, Rush BK, Machulda MM, Fields JA, Ferman TJ, Baker M, Rutherford NJ, Adamson J, Wszolek ZK, Adeli A, Savica R, Boot B, Kuntz KM, Gavriloa R, Reeves A, Whitwell J, Kantarci K, Jack CR Jr, Parisi JE, Lucas JA, Petersen RC, Rademakers R. Characterization of frontotemporal dementia and/or amyotrophic lateral sclerosis associated with the GGGGCC repeat expansion in C9ORF72. *Brain*. 2012; 135(Pt 3): 765-783.

Boot BP, Boeve BF, Roberts RO, Ferman TJ, Geda YE, Pankratz VS, Ivnik RJ, Smith GE, McDade E, Christianson TJ, Knopman DS, Tangalos EG, Silber MH, Petersen RC. Probable rapid eye movement sleep behavior disorder increases risk for mild cognitive impairment and Parkinson disease: a population-based study. *Ann Neurol*. 2012; 71(1): 49-56.

Ferman TJ, Arvanitakis Z, Fujishiro H, Duara R, Parfitt F, Purdy M, Waters C, Barker W, Graff-Radford NR, Dickson DW. Pathology and temporal onset of visual hallucinations, misperceptions, and family misidentification distinguishes dementia with Lewy bodies from Alzheimer's disease. *Parkinsonism Relat Disord*. 2013; 19(2): 227-231.

Greenaway MC, Duncan NL, Smith GE. The memory support system for mild cognitive impairment: randomized trial of a cognitive rehabilitation intervention. *Int J Ger Psychiatry*. 2012.

Julian L, Serafin D, Charvet L, Ackerson J, Benedict R, Braaten E, Brown T, O'Donnell E, Parrish J, Preston T, Zaccariello M, Belman A, Chitnis T, Gorman M, Ness J, Patterson M, Rodriguez M, Waubant E, Weinstock-Guttman B, Yeh A, Krupp LB, Network of Pediatric MS Centers of Excellence. Cognitive impairment occurs in children and adolescents with multiple sclerosis: results from a United States network. *J Child Neurol*. 2013; 28(1): 102-107.

Kantarci K, Lowe VJ, Boeve BF, Weigand SD, Senjem ML, Przybelski SA, Dickson DW, Parisi JE, Knopman DS, Smith GE, Ferman TJ, Petersen RC, Jack CR Jr. Multimodality imaging characteristics of dementia with Lewy bodies. *Neurobiol Aging*. 2012; 33(9): 2091-2105.

Machulda MM, Whitwell JL, Duffy JR, Strand E, Dean PM, Senjem ML, Jack CR Jr, Josephs KA. Identification of an atypical variant of logopenic progressive aphasia. *Brain Language*.

Mainwaring LM, Trenerry M. Introduction to the special issue on sport concussion: Clinical best practices for assessment and management. *J Clin Sport Psychology*. 2012; 6(3): 203-206.

Pedraza O, Allen M, Jennette K, Carrasquillo M, Crook J, Pankratz VS, Palusak R, Nguyen T, Malphrus K, Ma L, Biseoglio G, Roberts RO, Lucas JA, Ivnik RJ, Smith GE, Graff-Radford NR, Petersen RC, Younkin SG, Ertekin-Taner N. Evaluation of memory endophenotypes for association with CLU, CR1 and PICALM variants in African-American and Caucasian subjects. *Alzheimer's Dementia*.

Purdom CL, Kirlin KA, Hoerth MT, Noe KH, Drazkowski JF, Sirven JI, Locke DE. The influence of impression management scales on the Personality Assessment Inventory in the epilepsy monitoring unit. *Epilepsy Behav*. 2012; 25(4): 534-538.

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Wegener ST, Adams LL, Rohe D. Promoting optimal functioning in spinal cord injury: the role of rehabilitation psychology. *Handbook Clin Neurol*. 2012; 109: 297-314.



Obesity, Bariatric Surgery, and Eating Disorders Programs

INVESTIGATORS

Matthew M. Clark, PhD, LP, Karen B. Grothe, PhD, LP, Leslie A. Sim, PhD, LP, Bridget K. Biggs, PhD, LP, Karen M. Graszer, MA, LP, Sarah A. Kalsy, MA, LP (Rochester, Minnesota)

Gretchen E. Ames, PhD (Jacksonville, Florida)



*Back: Luenzmann, Clark, Biggs, Graszer
Front: Sim, Grothe, Kalsy*



Ames

This multidisciplinary research team is involved in several clinical projects and National Institutes of Health–funded clinical trials that examine the influence of psychological functioning and neurobiology on obesity and eating disorders and their treatment, conducted at the Rochester, Minnesota, and Jacksonville, Florida, Mayo Clinic sites. Current adult investigations focus on the impact of behavioral interventions on bariatric surgery outcomes, primary care–based obesity treatment, and the prevalence of manic symptoms in bariatric surgery patients. Pediatric studies focus on understanding adolescents’ preferences for social support for development of a healthy lifestyle and the effect of training children and their parents in stress management and mindful eating based on body mass index and cardiovascular risk markers. Eating disorders research focuses on the use of functional magnetic resonance imaging to understand the neurobiological aspects of anorexia and bulimia nervosa. Additional studies examine the role of family functioning in adolescent eating disorders and explore whether athletes with eating disorders differ from non-athletes. The application of non-exercise activity thermogenesis to anorexia nervosa represents a novel method to understand and monitor weight regulation. Through our investigations, we hope to improve long-term treatment outcomes for persons with eating disorders and obesity.

GRANTS

National Institute of Diabetes and Digestive and Kidney Diseases (R01): Adjustable Gastric Banding and its Effects on Postprandial Glucose Metabolism Independent of Weight Loss. Funding period: 07/2010 – 06/2014; PI: Vella.

National Institute of Diabetes and Digestive and Kidney Diseases (R01): Pharmacogenomics of Gastric Function and Weight in Obesity. Funding period: 09/2004 – 09/2015; PI: Camilleri.

Enteromedics: ReCharge: A Prospective, Randomized, Blinded, Parallel-Group, Multicenter Trial to Evaluate the Safety and Efficacy of the Maestro RC2 System in Treating Obesity. Funding period: 05/2011 – 10/2016; PI: Que.

Health Disparities Pilot Project: A formative study of wellness programming at Boys and Girls Club Rochester. Funding period: 09/2012 – 08/2013. PI: Biggs.

Orexigen: A Multicenter, Randomized, Double-Blind, Placebo-Controlled Study Assessing the Occurrence of Major Adverse Cardiovascular Events (MACE) in Overweight and Obese Subjects With Cardiovascular Risk Factors Receiving Naltrexone SR/ Bupropion SR. Funding period: 08/2012 – 08/2016; PI: Ebbert.

T. Denny Sanford Pediatric Collaborative Research Fund: Effect of Mindful Eating on Body Mass Index and Cardiovascular Risk Markers in Obese Children and Their Parents: A Pilot Randomized Clinical Trial. Funding period: 02/2011 – 02/2012; PI: Kumar.

Mayo Clinic Department of Psychiatry & Psychology Small Grants Program: An evaluation of an online, family-based indicated prevention program for adolescent eating disorders. Funding period: 05/2012 – 05/2014; PI: Sim.

Mayo Clinic Department of Psychiatry & Psychology Small Grants Program: The influence of social comparison on reward related brain activity in anorexia nervosa. Funding period: 07/2010 – 06/2012; PI: Sim.

Mayo Clinic Department of Psychiatry & Psychology Small Grants Program: Overweight Adolescents' Preferences for Social Support for Weight Management. Funding period: 06/2011 – 06/2012; PI: Biggs.

Mayo Clinic Florida Clinical Research Committee: Development of a Short Form of the Weight Efficacy Lifestyle Questionnaire. Funding period: 05/2011 – 05/2012; PI: Ames.

Mayo Clinic Florida Research Committee: Improving Maintenance Following Very Low Calorie Diet: The Sustain Lost Weight (SLW) Intervention. Funding period: 10/2010 – 10/2012; PI: Ames.

KEY PUBLICATIONS

Almandoz JP, Singh E, Howell LA, Grothe K, Vlazny DT, Smailovic A, Irving BA, Nelson RH, Miles JM. Spillover of Fatty Acids during Dietary Fat Storage in Type 2 Diabetes: Relationship to Body Fat Depots and Effects of Weight Loss. *Diabetes*. 2013.

Ames GE, Heckman MG, Grothe KB, Clark MM. Eating self-efficacy: development of a short-form WEL. *Eat Behav*. 2012; 13(4): 375-378.

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Cunningham JL, Merrell CC, Sarr M, Somers KJ, McAlpine D, Reese M, Stevens SR, Clark MM. Investigation of antidepressant medication usage after bariatric surgery. *Obes Surg*. 2012; 22(4): 530-535.

Goldberg RF, Parker M, Stauffer JA, Moti S, Sylvia J, Ames GE, Asbun HJ, Lynch SA, Smith CD, Bowers SP. Surgeon's requirement for obesity reduction: its influence on weight loss. *Am Surg*. 2012; 78(3): 325-328.

Lebow J, Sim LA, Erwin PJ, Murad MH. The effect of atypical antipsychotic medications in individuals with anorexia nervosa: A systematic review and meta-analysis. *Int J Eat Disord*. 2012.

Sim LA, Matthews A. The Role of Illness Perceptions in Family Functioning, Maternal Distress, and Adolescent Symptoms in Adolescent Girls with Anorexia Nervosa and Girls with a Chronic Medical Illness. *J Child Fam Stud*. 2012.

Topazian M, Camilleri M, Enders FT, Clain JE, Gleeson FC, Levy MJ, Rajan E, Nehra V, Dierkhising RA, Collazo-Clavell ML, Talley NJ, Clark MM. Gastric antral injections of botulinum toxin delay gastric emptying but do not reduce body weight. *Clin Gastroenterol Hepatol*. 2013; 11(2): 145-150.

Walker R, Hunt YM, Olivier J, Grothe KB, Dubbert PM, Burke RS, Cushman WC. Descriptive characteristics and cluster analysis of male veteran hazardous drinkers in an alcohol moderation intervention. *Am J Addict*. 2012; 21(4): 335-342.

Wallace DP, Sim LA, Harrison TE, Bruce BK, Harbeck-Weber C. Covert video monitoring in the assessment of medically unexplained symptoms in children. *J Pediatr Psychol*. 2012; 37(3): 329-337.

AWARDS AND LEADERSHIP ROLES

Gretchen E. Ames, Member, The Obesity Society Membership Committee.

Gretchen E. Ames, Practice Samples Reviewer, American Board of Professional Psychology.

Matthew M. Clark, Editorial Board Member, *Eating Behaviors*.

Karen B. Grothe, Editorial Board Member, *Bariatric Times*.

PRESENTATIONS

Ames GE, Heckman MG, Grothe KB, Clark MM. Eating self-efficacy: Development of a short-form WEL. *International Congress of Behavioral Medicine*. 2012.

Himes S, Grothe KB, Clark MM, Swain JM, Collazo-Clavell ML, Sarr MG. A behavioral intervention for post-bariatric patients in early weight regain relapse. *American Society of Metabolic and Bariatric Surgery*. 2012.

Sleep Medicine

INVESTIGATORS

R. Robert Auger, MD (Rochester, Minnesota)

Lois E. Krahn, MD (Scottsdale, Arizona)

Paul A. Fredrickson, MD, Siong-Chi Lin, MD (Jacksonville, Florida)



Krahn, Auger



Fredrickson, Lin

Mayo Clinic Department of Psychiatry & Psychology has historically been featured prominently in the field of sleep medicine. The late Peter J. Hauri, PhD, LP (Professor Emeritus, Mayo Clinic) founded the American Sleep Disorders Association, authored the internationally renowned self-care book *No More Sleepless Nights*, and was widely considered to be the world's authority on insomnia. Dr. Fredrickson is past president of the American Academy of Sleep Medicine (AASM). Drs. Auger, Lin, and Krahn continue this trend of national visibility and scholarship. Dr. Krahn served as joint editor of an influential sleep medicine textbook, *Sleep Medicine in Clinical Practice*, the second edition of which was recently published. Her research interests include narcolepsy, sleep disorders in women, and the interplay of psychiatric disorders and sleep. She previously has received funding from the Narcolepsy Network. Dr. Lin is investigating genetic research involving patients with restless legs syndrome, which has resulted in many important publications. Dr. Auger has served and/or chaired various AASM task forces, which have resulted in prominent publications and associated practice parameters. He is currently a member of the AASM Research Committee and of the American Sleep Medicine Foundation Executive Board. He is chair of the AASM Circadian Rhythms Membership Section and has directed and participated in numerous sleep medicine courses at national meetings. His primary research interests reside in the realm of circadian-based interventions for the treatment of sleep disorders. Dr. Auger completed the funding periods of CR20 and Small Grant Awards in 2009 and 2011, respectively, and recently received industry funding for a study that investigated light therapy for seasonal affective disorder.

GRANTS

Phillips Corporation: Comparing Wavelengths of Light in Seasonal Affective Disorder (SAD): A Placebo-Controlled Trial of Short-Duration Exposure (“SAD goQuick”). Funding period: 01/2012 – 01/2013; PI: Auger.

Mayo Clinic Department of Psychiatry & Psychology Small Grants Award: Examining the Frequency of Substance Misuse Among Patients With Primary Disorders of Hypersomnolence: A Retrospective Case-Control Study. Funding period: 10/2009 – 10/2011; PI: Auger.

KEY PUBLICATIONS

Auger RR, Boeve BF. Sleep disorders in neurodegenerative diseases other than Parkinson’s disease. *Handb Clin Neurol*. 2011; 99: 1011-1050.

Auger RR, Burgess HJ, Dierkhising RA, Sharma RG, Slocumb NL. Light exposure among adolescents with delayed sleep phase disorder: a prospective cohort study. *Chronobiol Int*. 2011; 28(10): 911-920.

Dejesus-Hernandez M, Rayaprolu S, Soto-Ortolaza AI, Rutherford NJ, Heckman MG, Traynor S, Strongosky A, Graff-Radford N, Van Gerpen J, Uitti RJ, Shih JJ, Lin SC, Wszolek ZK, Rademakers R, Ross OA. Analysis of the C9orf72 repeat in Parkinson’s disease, essential tremor and restless legs syndrome. *Parkinsonism Relat Disord*. 2013; 19(2): 198-201.

Spector AR, Dugger BN, Wszolek ZK, Uitti RJ, Fredrickson P, Kaplan J, Boeve BF, Dickson DW, Strongosky A, Lin SC. Anatomy of disturbed sleep in pallido-ponto-nigral degeneration. *Ann Neurol*. 2011; 69(6): 1014-1025.

Winkelmann J, Czamara D, Schormair B, Knauf F, Schulte EC, Trenkwalder C, Dauvilliers Y, Polo O, Hogg B, Berger K, Fuhs A, Gross N, Stiasny-Kolster K, Oertel W, Bachmann CG, Paulus W, Xiong L, Montplaisir J, Rouleau GA, Fietze I, Vavrova J, Kemlink D, Sonka K, Nevsimalova S, Lin SC, Wszolek Z, Vilarino-Guell C, Farrer MJ, Gschliesser V, Frauscher B, Falkenstetter T, Poewe W, Allen RP, Earley CJ, Ondo WG, Le WD, Spieler D, Kaffe M, Zimprich A, Kettunen J, Perola M, Silander K, Cournu-Rebeix I, Francavilla M, Fontenille C, Fontaine B, Vodicka P, Prokisch H, Lichtner P, Peppard P, Faraco J, Mignot E, Gieger C, Illig T, Wichmann HE, Muller-Myhsok B, Meitinger T. Genome-wide association study identifies novel restless legs syndrome susceptibility loci on 2p14 and 16q12.1. *PLoS Genet*. 2011; 7(7).

Transplant Psychiatry and Psychology

INVESTIGATORS

Tamara J. Dolenc, MD, Shawna L. Ehlers, PhD, LP, Daniel K. Hall-Flavin, MD, Sheila G. Jowsey, MD, Victor M. Karpyak, MD, PhD, Larissa L. Loukianova, MD, PhD, Terry D. Schneekloth, MD (Rochester, Minnesota)

Steven C. Ames, PhD, Shehzad K. Niazi, MD, Adriana R. Vasquez, MD (Jacksonville, Florida),

Robert P. Bright, MD, Kari A. Martin, MD, Thomas K. Nelson, MD (Scottsdale, Arizona)



Vasquez



Hall-Flavin, Loukianova, Dolenc, Schneekloth, Jowsey, Karpyak



Nelson, Hurst, Bright

Transplant Psychiatry and Psychology research efforts focus on both pre-transplant assessment and post-transplant outcomes for solid organ and BMT patients. This group continues a multi-center study of outcomes in alcoholic liver transplant candidates and published preliminary findings on liver transplantation in alcoholic patients with ≤ 6 months abstinence, an area of increasing investigation and discussion in liver transplantation. Mayo's leadership role in the assessment of hand transplant patients and the development of a multi-center database for hand transplant candidates was supported by the Tarek E. Obaid Grant. Dr. Jowsey, in collaboration with Martin Kumnig, Ph.D., Medical University of Innsbruck, was invited to present at the first ever Transplant Psychiatry Symposium on Hand Transplantation at the American Society of Reconstructive Transplantation. Dr. Jowsey is also collaborating with researchers at the University of Alabama, Washington University, and the University of Minnesota on the NIDDK funded RELIVE study of long-term outcomes in kidney donors. Dr. Ehlers continues her investigation of modifiable unhealthy lifestyle behaviors and behavioral intervention development for hematopoietic stem cell transplant patients. Dr. Schneekloth was invited by the American Journal of Transplantation to comment in an editorial on research findings which associate untreated post-transplant depression with significantly increased mortality in liver transplant patients. Other research initiatives include outcomes in pancreas and lung transplant for patients with psychiatric conditions, the role of health coaching and health literacy in transplantation, the impact of post-transplant smoking on alcohol relapse in liver transplantation, and liver transplant outcomes in patients with Bipolar Disorder.

GRANTS

Early Career Research Development Supplement Award: Behavioral Intervention Development for Hematopoietic Stem Cell Transplant Survivors. Funding period: 2011-2012; PI: Ehlers.

Tarek E. Obaid Award for Research in Vascularized Composite Transplantation: Development of a Psychosocial Assessment Tool for Reconstructive Hand Transplantation. Funding period: 2011-2012; PI: Jowsey, Co-Investigators: Kumnig (Medical University of Innsbruck), Schneekloth, Rummans, Kremers, Hatem.

KEY PUBLICATIONS

Jowsey SG, Cutshall SM, Colligan RC, Stevens SR, Kremers WK, Vasquez AR, Edwards BS, Daly RC, McGregor CG. Seligman's theory of attributional style: optimism, pessimism, and quality of life after heart transplant. *Prog Transplant*. 2012; 22(1): 49-55.

Kumnig M, Jowsey SG, Rumpold G, Weissenbacher A, Hautz T, Engelhardt TO, Brandacher G, Gabl M, Ninkovic M, Rieger M, Zelger B, Zelger B, Blauth M, Margreiter R, Pierer G, Pratschke J, Schneeberger S. The psychological assessment of candidates for reconstructive hand transplantation. *Transpl Int*. 2012; 25(5): 573-585.

Rivera MN, Jowsey S, Alsina AE, Torres EA. Factors contributing to health disparities in liver transplantation in a hispanic population. *P R Health Sci J*. 2012; 31(4): 199-204.

Romanowicz M, Ehlers SL, Walker D, Decker P, Rundell J, Shinozaki G, Litzow M, Hogan W, Mrazek D, Black J. Testing a diathesis-stress model: Potential genetic risk factors for development of distress in context of acute leukemia diagnosis and transplant. *Psychosomatics*. 2012; 53(5): 456-462.

Schneekloth TD, Jowsey SG, Biernacka JM, Burton MC, Vasquez AR, Bergquist T, Drews MS, Gores GJ. Pretransplant psychiatric and substance use comorbidity in patients with cholangiocarcinoma who received a liver transplant. *Psychosomatics*. 2012; 53(2): 116-122.

Solberg Nes L, Ehlers SL, Patten CA, Gastineau DA. Self-Regulatory Fatigue in Hematologic Malignancies; Impact of Quality of Life, Coping, and Adherence. *Int J Behav Med*. 2013; 20(1): 13-21.

Yost KJ, Eton DT, Sinicrope PS, Thompson CA, Rosenstein LJ, Allmer C, Maurer MJ, Slager SL, Ehlers SL, Link BK, Cerhan JR. The FACT-G is valid for monitoring HRQOL in non-Hodgkin lymphoma patients. *Leukemia and Lymphoma*.

PRESENTATIONS

Bronars C, Ehlers SL, Patten CA, Brockman T, Hughes C, Decker P, Hogan W, Dispenzieri A, Ansell S, Ebbert J, Klesges, Gastineau D. Assessment of Tobacco Use in Hematopoietic Stem Cell Transplant (HSCT) Patients. *Society of Behavioral Medicine*. 2012.

Ehlers SL, Patten CA, Cerhan JR, Brockman T, Hughes C, Decker PA, Hogan WJ, Dispenzieri A, Ansell S, Ebbert JO, Gastineau DA. Modifiable unhealthy lifestyle behaviors among pre-transplant hematologic cancer survivors: Change since diagnosis and receipt of provider advice to change. *American Psychosocial Oncology Society*. 2012.

Ehlers SL, Patten CA, Cerhan JR, Brockman T, Hughes C, Decker PA, Klesges RC, Hogan WJ, Dispenzieri A, Ansell S, Ebbert JO, Gastineau DA. Modifiable unhealthy lifestyle behaviors among pre-transplant hematologic cancer survivors: Meeting guidelines. *Society of Behavioral Medicine*. 2012.

Howell L, Ehlers SL, Gastineau GA. Social Support as a Predictor of Quality of Life for Bone Marrow Transplant Patients. *American Psychosocial Oncology Society*. 2012.

Jowsey S, Kumnig M, Schneekloth T, Case E, McCoy T, Amer H. The role of social media and the psychosocial evaluation of hand transplant candidates. *European Association of Consultation-Liaison Psychiatry and Psychosomatics (EACLPP) & European Conference on Psychosomatic Research (ECPR)*. 2012.

McCoy TL, Cutshall SM, Vickers Douglas KS, Hathaway JC, Schneekloth TD, Jowsey SG. Feasibility of a health coaching program for transplant patients. *Academy of Psychosomatic Medicine*. 2012.

Osagie NE, Ehlers SL, Merten JA, Hogan WJ, Litzow MR, and Wolf RC. Correlation of medication burden and quality of life in allogeneic hematopoietic stem cell transplant patients. *BMT Tandem Meetings*. 2012.

Schneekloth TD, Jowsey SG, Heimbach JK, McCoy TL, Hall-Flavin DK, Karpyak VM, Loukianova LL, Charlton MR. Early liver transplantation for alcoholic cirrhosis: outcome for those with ≤6 months abstinence. *Academy of Psychosomatic Medicine*. 2012.

Solberg Nes L, Ehlers SL, Patten CA, Decker P, Gastineau DA. Self-regulatory fatigue (SRF) and hematopoietic stem cell transplantation (HSCT); Impact on coping, quality of life, and health behaviors pre- and post-transplant. *Society of Behavioral Medicine*. 2012.

Solberg Nes L, Ehlers SL, Whipple M, Vincent A. Self-Regulatory Fatigue in Chronic Multi-Symptom Illnesses: Scale Development and Validation. *American Psychosomatic Society Annual Scientific Meeting*.

Vasquez AR, Schneekloth TD, Jowsey SG, Rummans TA, Rundell JR. Management of bipolar affective disorder in the context of liver transplantation at Mayo Clinic Florida (MCF). *European Association of Consultation-Liaison Psychiatry and Psychosomatics (EACLPP) & European Conference on Psychosomatic Research (ECPR)*. 2012.

Integrated Behavioral Health Research



INVESTIGATORS

Kurt B. Angstman, MD,
Ramona S. DeJesus, MD,
David J. Katzelnick, MD, Gabrielle J. Melin, MD,
Victor M. Montori, MD,
Norman H. Rasmussen, EdD, LP,
Nilay D. Shah, PhD, Nathan D. Shippee, PhD,
Kristin J. Somers, MD,
Kristin S. Vickers Douglas, PhD, LP,
Mark D. Williams, MD, Isaac O. Johnson,
Mary A. Severson

*Back: Katzelnick, Rasmussen, Angstman, Somers, Severson
Front Seated: Vickers Douglas, DeJesus, Williams, Shippee*

The primary care and behavioral health interface is a rich environment for research. This team of investigators is from a variety of disciplines and has been researching the implementation of evidence based quality improvement projects for several prevalent mental health conditions presenting in primary care. There are ongoing investigations examining a model of adult depression care (DIAMOND) with several projects led by Drs. Kurt Angstman and Ramona DeJesus and an outcomes and qualitative research on care management led by Dr. Kristin Vickers Douglas. Dr. Gabrielle Melin leads a project examining ED utilization and Dr. Kristin Somers leads research on patients presenting with unexplained medical symptoms.

The Coordinated Anxiety Learning and Management (CALM) is an innovative model for the provision of evidence-based psychotherapy in primary care for adults with anxiety disorder. Initial outcomes show results for patients with generalized anxiety disorder are robust and clinically significant. We have also created an adaption of care coordination for adult depression into adolescent patients called Early Management and Evidence-Based Recognition of Adolescents Living With Depression (EMERALD). Patients and primary care providers responded positively to both of these patient care models.

Another important development in 2012 was our receiving a substantial 3-year grant with the Center for Medicare and Medicaid studies as a part of a multisite implementation of a model of care coordination for patients co-morbid for Diabetes, Cardiovascular Disease, and Depression (COMPASS). Our research team is busy starting up implementation of this project in the Mayo Clinic Health System at six primary care sites around the state.

GRANTS

Agency for Healthcare Research and Quality (R18): Translation of Comparative Effectiveness of Depression Medications into Practice. Funding period: 09/2010 – 08/2013; PI: Montori; Co-Investigator: Williams.

Center for Medicare and Medicaid Services (CMS): Care Management of Mental, Physical, and Substance use Syndromes (COMPASS). Funding period: 06/2012 – 07/2015. PIs: Williams, Katzelnick.

KEY PUBLICATIONS

Angstman KB, Pietruszewski P, Rasmussen NH, Wilkinson JM, Katzelnick DJ. Depression remission after six months of collaborative care management: role of initial severity of depression in outcome. *Ment Health Fam Med*. 2012; 9(2): 99-106.

Angstman KB, Rohrer JE, Rasmussen NH. PHQ-9 response curve: Rate of improvement for depression treatment with collaborative care management. *J Prim Care Community Health*. 2012; 3(3): 154-157.

Angstman KB, Shippee ND, MacLaughlin KL, Rasmussen NH, Wilkinson JM, Williams MD, Katzelnick DJ. Patient self-assessment factors predictive of persistent depressive symptoms 6 months after enrollment in collaborative care management. *Depress Anxiety*. 2013; 30(2): 143-148.

Cunningham JL, Merrell CC, Sarr M, Somers KJ, McAlpine D, Reese M, Stevens SR, Clark MM. Investigation of antidepressant medication usage after bariatric surgery. *Obesity Surg*. 2012; 22(4): 530-535.

DeJesus RS, Vickers KS, Howell LA, Stroebel RJ. Qualities of care managers in chronic disease management: Patients and providers' expectations. *Prim Care Diabetes*. 2012; 6(3): 235-239.

Flynn PM, Ridgeway JL, Wieland ML, Williams MD, Haas LR, Kremers WK, Breitkopf CR. Primary Care Utilization and Mental Health Diagnoses Among Adult Patients Requiring Interpreters: a Retrospective Cohort Study. *J Gen Intern Med*. 2012.

Rasmussen NH, Agerter DC. "Bodily Distress Disorders in Primary Care Mental Health," in *Companion to Primary Care Mental Health*, Ivbijaro G. Radcliffe Publishing; 2012: 387-417.

Shippee ND, Shah ND, Angstman KB, DeJesus RS, Wilkinson JM, Bruce SM, Williams MD. Impact of collaborative care for depression on clinical, functional, and work outcomes: a practice-based evaluation. *J Ambul Care Manage*. 2013; 36(1): 13-23.

Vickers KS. Self-management education approach: engaging patients in creating a personal and relevant action plan (Part 1) I keep telling patients what to do, so why don't they make progress? *Journal of Ren Nutr*. 2012; 22(6): e51-53.

Vickers KS. Self-management education approach: engaging patients in creating a personal and relevant action plan (part 2): I keep telling patients what to do, so why don't they make progress? *J Ren Nutr*. 2013; 23(1).

PRESENTATIONS

DeJesus, R. Subset analysis of antidepressant medication utilization among geriatric patients with depression: comparison between usual care and collaborative care using care managers. *AGS Annual Scientific Meeting*. 2012.

Minnesota Psychiatric Consultation Services Program (MhINT Program)

INVESTIGATORS

Peter S. Jensen, MD, Jyoti Bhagia, MD,
Paul E. Croarkin, DO



Jensen, Bhagia, Croarkin

In June 2012, this research team was funded by the Minnesota Department of Human Services to deliver rapid peer-to-peer consultations state-wide, and to provide immediate, daily phone support to healthcare providers with patient-specific diagnostic or treatment problems encountered in their practice settings. In addition to provision of consultation services, a series of continuing education programs, as well as “hands-on” coaching in the essential *mental health diagnosis/treatment skills* will be provided to primary care clinicians.

While Mayo Clinic is the primary study site, the consortium includes five partnering healthcare organizations spread across the state to ensure that consultation and training services are equitably distributed across Minnesota regions: Mayo Clinic (Southeast), Sanford Health (Southwest, West), Essentia Health (North, NE), PrairieCare (Twin Cities), and Allina (Twin Cities). In addition to the healthcare organizations, the consortium was joined by additional partners, needed to accomplish all program purposes: For the “hands-on” coaching in essential *mental health diagnosis/treatment skills*, The REACH Institute, a national primary care/mental health training non-profit organization, was an essential, valuable partner, given its extensive experience in delivering sustained (6-12 months), hands-on coaching/skills development for > 1100 physicians in primary care child mental health services since 2005.

In fall 2012, the statewide daily phone consultation services became operational, and the first regional coaching/skills training programs were launched. During the first two years, the consortium expects to deliver REACH’s *primary care mental health* coaching/skills-building programs to as many as 350 of Minnesota’s 4,000 primary care clinicians, enlisting them as “primary care champions” in the process of transforming child mental health services statewide, via increased primary care expertise and service capacity. Other program components include innovative video-technology for trainings and consultations, new web-tools, and on-line services that improve communication and mental health referral services statewide.

GRANT

Minnesota Department of Human Services: Minnesota Psychiatric Consultative Services Program. Funding period: 06/2012 – 05/2015; PI: Jensen.





Osama A. Abulseoud, MD

Dr. Abulseoud graduated from Cairo University Medical School in Egypt. He worked with and was trained by George M Simpson, M.D., at the University of Southern California before he joined the extra-mural NIMH fellowship program at the mood disorder research program at UCLA under the mentorship of Mark A Frye, M.D., and Lori Altshuler, M.D. He spent two years at Huntington Medical Research Institute studying brain glutamate changes in patients using two different spectroscopic methods under the mentorship of Brian D. Ross, M.D., Ph.D. This prompted him to seek further training in animal models of addiction at the laboratory of Daniel P. Holschneider, M.D., before he joined the addiction psychiatry clinical fellowship at Mayo Clinic in 2010. His interest in glutamate signaling in addiction is in line with our laboratory in collaboration with the biomedical engineering laboratory of Kendall Lee, M.D., Ph.D. Currently, he is studying the neurobiological underpinnings of alcoholism using proton spectroscopy and modulating the addiction behavior as well as the

reward circuitry neurotransmitters using high frequency stimulation of the nucleus accumbens in alcohol preferring rats. Preliminary results show significant effects of stimulation on drinking behavior and circadian rhythm activity.

Dr. Abulseoud is a firm believer in multidisciplinary and engaging different brilliant minds in molecular pharmacology, biomedical engineering, neurosurgery, and addiction psychiatry to solve the mystery of addiction behavior. Recently, he was able to test the efficacy of the β -lactam antibiotic ceftriaxone in blocking methamphetamine-triggered reinstatement of conditioned place preference in rats and its ability to induce transcription of EAAT2 mRNA in prefrontal cortex and nucleus accumbens.

GRANTS

National Institute of Health: Controlled Trial of Deep Brain Stimulation for Obsessive-Compulsive Disorder. Funding period: 09/2012 – 08/2013. PI: Abulseoud.

Mayo KL2 Mentored Career Development Program: Preclinical Glutamate Modulation through Deep Brain Stimulation as a Novel Target for Alcohol Addiction. Funding period: 07/2011 – 06/ 2014. PI: Abulseoud.

KEY PUBLICATIONS

Abulseoud O, Gitlin M, Altshuler L, Frye M. Baseline Thyroid Indices and the Subsequent Response to Citalopram Treatment, a Pilot Study. *Brain Behav.* 2013.

Abulseoud O, Karpayak V, Schneekloth T, Hall-Flavin D, Loukianova L, Geske J, Biernacka, Mrazek D, Frye M. Negatively Valenced Emotional Stimuli are Associated with Heavy Drinking among Women with Alcohol Dependence. *Am J Addiction.* 2013.

Abulseoud OA, Miller JD, Wu J, Choi DS, Holschneider DP. Ceftriaxone upregulates the glutamate transporter in medial prefrontal cortex and blocks reinstatement of methamphetamine seeking in a condition place preference paradigm. *Brain Res.* 2012; 1456: 14-21.

Anderson RJ, Frye MA, Abulseoud OA, Lee KH, McGillivray JA, Berk M, Tye SJ. Deep brain stimulation for treatment-resistant depression: efficacy, safety and mechanisms of action. *Neurosci Biobehav Rev.* 2012; 36(8): 1920-1933.

Karpayak VM, Winham SJ, Biernacka JM, Cunningham JM, Lewis KA, Geske JR, Colby CL, Abulseoud OA, Hall-Flavin DK, Loukianova LL, Schneekloth TD, Frye MA, Heit JA, Mrazek DA. Association of GATA4 sequence variation with alcohol dependence. *Addict Biol.* 2012.

Karpayak VM, Winham SJ, Biernacka JM, Preuss UW, Zill P, Cunningham JM, Walker DL, Lewis KA, Geske JR, Colby CL, Abulseoud OA, Hall-Flavin DK, Loukianova LL, Schneekloth TD, Frye MA, Heit JA, Bakalkin G, Mrazek DA. Association of the PDYN gene with alcohol dependence and the propensity to drink in negative emotional states. *Addict Biol.* 2012.

Karpayak VM, Winham SJ, Preuss UW, Zill P, Cunningham JM, Walker DL, Lewis KA, Geske JR, Colby CL, Abulseoud OA, Hall-Flavin DK, Loukianova LL, Schneekloth TD, Frye MA, Bazov I, Heit JA, Bakalkin G, Mrazek DA, Biernacka JM. Association of the PDYN gene with alcohol dependence and the propensity to drink in negative emotional states. *Int J Neuropsychopharmacol.* 2012.

Kim JP, Min HK, Knight E, Abulseoud OA, Marsh MP, Kelsey K, Duffy PS, Blaha C, Bennet KE, Frye MA, Lee KH. Centromedian-Parafascicular Deep Brain Stimulation Modulates Motor, Associative, and Limbic circuits: 3T fMRI Study in Large Animal. *Biol Psychiatry.*

Knight E, Min HK, Hwang SC, Marsh M, Kim I, Felmlee J, Abulseoud OA, Frye MA, Lee KH. Insular and Prefrontal Cortical Activation During Nucleus Accumbens High Frequency Stimulation in a Large Animal Model: a functional MRI study. *PLoS ONE.*

Lingwood MD, Siaw TA, Sailasuta N, Abulseoud OA, Chan HR, Ross BD, Bhattacharya P, Han S. Hyperpolarized Water as an MR Imaging Contrast Agent: Feasibility of in Vivo Imaging in a Rat Model. *Radiology.* 2012; 265(2): 418-425.

Mallory GW, Abulseoud O, Hwang SC, Gorman DA, Stead SM, Klassen BT, Sandroni P, Watson JC, Lee KH. The nucleus accumbens as a potential target for central poststroke pain. *Mayo Clin Proc.* 2012; 87(10): 1025-1031.

William V. Bobo, M.D.



Dr. Bobo's long-term goal is a career focused on research that improves the care of patients with bipolar disorder and other severe mood disorders. His primary approach is to conduct epidemiologic studies that seek to clarify the relative safety and effectiveness of medications used to treat patients with severe mood disorders and their comorbidities, with experimental randomized clinical trials as a secondary focus. The ability to conduct large-scale epidemiologic studies of comparative drug safety and effectiveness will allow Dr. Bobo to examine the effects of medicines—both as single treatments and in complex combinations—across a wider variety of clinically important endpoints than would be possible with clinical trials alone, and in important patient subgroups that are under-represented or excluded from clinical trials. He will also be able to study patterns and determinants of medication use at the population level, including the longitudinal effects of major programs and policies on prescriber behavior or drug utilization.

GRANT

National Institute of Mental Health: Pharmacoepidemiology of Atypical Antipsychotic Drugs. Funding period: 06/2010 – 02/2014; PI: Bobo.

KEY PUBLICATIONS

Bobo WV, Cooper WO, Stein CM, Olfson M, Graham D, Daugherty J, Fuchs DC, Ray WA. Antipsychotics and the risk of type 2 diabetes in children and youth. *JAMA Psychiatry*.

Bobo WV, Cooper WO, Stein CM, Olfson M, Mounsey J, Daugherty J, Ray WA. Positive predictive value of a case definition for diabetes mellitus using automated administrative health data in children and youth exposed to antipsychotic drugs or control medications: a Tennessee Medicaid study. *BMC Med Res Methodol*. 2012; 12: 128.

Bobo WV, Davis RL, Toh S, Li DK, Andrade SE, Cheetham TC, Pawloski P, Dublin S, Pinheiro S, Hammad T, Scott PE, Epstein RA Jr., Arbogast PG, Morrow JA, Dudley JA, Lawrence JM, Avalos LA, Cooper WO. Trends in the use of antiepileptic drugs among pregnant women in the U.S., 2001-2007: a Medication Exposure in Pregnancy Risk Evaluation Program study. *Paediatr Perinat Epidemiol*. 2012; 26(6): 578-588.

Chen Y, Bobo WV, Watts K, Jayathilake K, Tang T, Meltzer HY. Comparative effectiveness of switching antipsychotic drug treatment to aripiprazole or ziprasidone for improving metabolic profile and atherogenic dyslipidemia: a 12-month, prospective, open-label study. *J Psychopharmacol*. 2012; 26(9): 1201-1210.

Epstein RA, Bobo WV, Shelton RC, Arbogast PG, Morrow JA, Want W, Chandrasekhar R, Cooper WO. Increasing use of atypical antipsychotics and anticonvulsants during pregnancy. *Pharmacoepidemiol Drug Saf*; 2012.



Paul E. Croarkin, D.O.

Dr. Croarkin is a child and adolescent psychiatrist whose research efforts focus on understanding the physiology, treatment, and classification of mood disorders in children and adolescents. This work includes clinical trials in child and adolescent mood disorders; long-term studies of the safety of selective serotonin reuptake inhibitors in youth, studies of novel therapeutics, such as repetitive transcranial magnetic stimulation (rTMS); and neurophysiological studies of the GABA and glutamate neurotransmitter systems. Dr. Croarkin has served as a co-investigator for collaborative trials in child and adolescent depression and as primary investigator for a study funded by Brain and Behavior Research Foundation that involved novel single and paired-pulse transcranial magnetic stimulation (TMS) measures of GABA and glutamate functioning in children and adolescents with major depressive disorder. His ongoing research will examine glutamate neurotransmission in adolescent psychiatric disorders with concurrent TMS paradigms and magnetic resonance spectroscopy.

GRANTS

Pfizer, Inc: Cortical Excitability and Inhibition in Children and Adolescents with MDD. Funding period: 02/2012 – 01/2013; PI: Croarkin.

Pfizer, Inc: SPRITES: Sertraline Pediatric Registry for the Evaluation of Safety Goals. Funding period: 04/2012 – 04/2016; Site PI: Croarkin.

Mayo Clinic: Glutamate Probes in Adolescent Depression. Funding period: 05/2012 – 05/2014; PI: Croarkin.

KEY PUBLICATIONS

Croarkin PE, Nakonezny PA, Husain MM, Melton T, Buyukdura JS, Kennard BD, Emslie GJ, Kozel FA, Daskalakis ZJ. Evidence for Increased Glutamatergic Cortical Facilitation in Children and Adolescents With Major Depressive Disorder. *JAMA Psychiatry*. 2013.

Croarkin PE, Wall CA, Nakonezny PA, Buyukdura JS, Husain MM, Sampson SM, Emslie GJ, Kozel FA. Increased cortical excitability with prefrontal high-frequency repetitive transcranial magnetic stimulation in adolescents with treatment-resistant major depressive disorder. *J Child Adolesc Psychopharmacol*. 2012; 22(1): 56-64.

Tian F, Kozel FA, Yennu A, Croarkin PE, McClintock SM, Mapes KS, Husain MM, Liu H. Test-retest assessment of cortical activation induced by repetitive transcranial magnetic stimulation with brain atlas-guided optical topography. *J Biomed Opt*. 2012; 17(11): 116020.

AWARDS & LEADERSHIP ROLES

Member, National Network of Depression Centers Biomarker Task Force and Child and Adolescent Psychiatry Task Force

Ad hoc Reviewer, American Institute of Biological Sciences, Scientific Peer Advisory and Review Services Division

Editorial Board-Review Editor, *Frontiers in Neuropsychiatric Imaging and Stimulation*

Julie A. Fields, Ph.D., L.P.



Dr. Fields is in the final stages of her project in the Building Interdisciplinary Research Careers in Women's Health program, Effects of Self-Efficacy in the Cognitively Impaired on Caregiver Burden Following HABIT (Healthy Action to Benefit Independence and Thinking) Intervention. Her primary goal is to determine if memory compensation programs such as HABIT increase a sense of self-efficacy in individuals with mild cognitive impairment (MCI) that translates into improvement in functional status and less dependence on caregivers. In addition, she is examining the effects of participation in the HABIT program on caregiver distress and, in particular, is seeking to determine whether men and women caregivers are affected differently. Ultimately, participation in multicomponent behavioral intervention programs such as HABIT may allow individuals with MCI to live longer independently and require fewer healthcare services, decreasing not only their own healthcare burden, but also the physical and emotional burden on their caregivers and associated economic burden on the nation at large. Dr. Fields has presented preliminary findings at national and international meetings. In 2012 she was invited three times to speak in forums that focused on non-pharmacologic interventions for MCI and dementia and in 2013 she will be presenting her findings in a workshop at a national meeting. She is a member of the ACT on Alzheimer's Disease Sustaining Caregivers Leadership Committee, which has the primary objective to impact health care policy relative to caregiving.

GRANT

National Institute of Health K12 Building Interdisciplinary Research Careers in Women's Health (BIRCWH) Award: Mayo Clinic Interdisciplinary Women's Health Program. Funding period: 01/2011 – 1/2013; PI: Bahn.

KEY PUBLICATIONS

Boeve BF, Boylan KB, Graff-Radford NR, DeJesus-Hernandez M, Knopman DS, Pedraza O, Vemuri P, Jones D, Lowe V, Murray ME, Dickson DW, Josephs KA, Rush BK, Machulda MM, Fields JA, Ferman TJ, Baker M, Rutherford NJ, Adamson J, Wszolek ZK, Adeli A, Savica R, Boot B, Kuntz KM, Gavriolova R, Reeves A, Whitwell J, Kantarci K, Jack CR Jr, Parisi JE, Lucas JA, Petersen RC, Rademakers R. Characterization of frontotemporal dementia and/or amyotrophic lateral sclerosis associated with the GGGGCC repeat expansion in C9ORF72. *Brain*. 2012; 135(Pt 3): 765-783.

Chopra A, Tye SJ, Lee KH, Sampson S, Matsumoto J, Adams A, Klassen B, Stead M, Fields JA, Frye MA. Underlying neurobiology and clinical correlates of mania status after subthalamic nucleus deep brain stimulation in Parkinson's disease: A review of the literature. *J Neuropsychiatry Clin Neurosci*. 2012; 24(1): 102-110.

McDade EM, Boeve BF, Fields JA, Kumar N, Rademakers R, Baker MC, Knopman BD, Petersen RC, Jack CR Jr, Kantarci K. MRS in Early and Presymptomatic Carriers of a novel octapeptide repeat insertion in the prion protein gene. *J Neuroimaging*. 2012.

Savica R, Adeli A, Vemuri P, Knopman DS, DeJesus-Hernandez M, Rademakers R, Fields JA, Whitwell J, Jack CR, Lowe V, Petersen RC, Boeve BF. Characterization of a family with the c9FTD/ALS associated with the GGGGCC repeat expansion in C9ORF72. *Arch Neurol*. 2012; 69(9): 1164-1169.



Maria I. Lapid, M.D.

Dr. Lapid is a geriatric psychiatrist with subspecialty training in hospice and palliative medicine. Her clinical expertise is in the care of geriatric patients with complex comorbidities and end-of-life issues. She is the founding program director of the Mayo Clinic Geriatric Psychiatry Fellowship. Her clinical research involves quality-of-life (QOL) issues of patients in geriatric, oncologic, or palliative care and their caregivers. She is leading a Psycho-Oncology research study on internet-based interventions for cancer caregivers to improve their quality of life and prevent burnout.

GRANTS

Linse Bock Foundation: Improving Quality of Life of Cancer Caregivers. Funding period: 01/2012 – 12/2014; PI: Lapid; Co-PIs: Rummans, Clark.

St. Mary's Hospital Sponsorship Board, Inc.: Cancer Caregivers Preferences on Technology-Based Caregiving Tools: A Survey Study. Funding period: 07/2012 – 12/2013; PI: Lapid, Co-PIs: Rummans, Clark.

KEY PUBLICATIONS

Clark MM, Rummans TA, Atherton PJ, Cheville AL, Johnson ME, Frost MH, Miller JJ, Sloan JA, Graszer KM, Haas JG, Hanson JM, Garces YI, Piderman KM, Lapid MI, Netzel PJ, Richardson JW, Brown PD. Randomized controlled trial of maintaining quality of life during radiotherapy for advanced cancer. *Cancer*. 2013; 119(4): 880-887.

Feely MA, Havyer RD, Lapid MI, Swetz KM. Management of End-of-Life Care and of Difficult Behaviors Associated With Borderline Personality Disorder. *J Pain Symptom Manage*. 2012.

Lapid MI, Piderman KM, Ryan SM, Somers KJ, Clark MM, Rummans TA. Improvement of quality of life in hospitalized depressed elderly. *Int Psychogeriatr*. 2011; 23(3): 485-495.

Lapid MI, Rummans TA, Boeve BF, McCormick JK, Pankratz VS, Cha RH, Smith GE, Ivnik RJ, Tangalos EG, Petersen RC. What is the quality of life in the oldest old? *Int Psychogeriatr*. 2011.

Lapid MI, Rummans TA, Brown PD, Frost MH, Johnson ME, Huschka MM, Sloan JA, Richardson JW, Hanson JM, Clark MM. Improving the quality of life of geriatric cancer patients with a structured multidisciplinary intervention: a randomized controlled trial. *Palliat Support Care*. 2007; 5(2): 107-114.

Parsaik AK, Lapid MI, Rummans TA, Cha RH, Boeve BF, Pankratz VS, Tangalos EG, Petersen RC. ApoE and quality of life in nonagenarians. *J Am Med Dir Assoc*. 2012; 13(8): 704-707.

Piderman KM, Lapid MI, Stevens SR, Ryan SM, Somers KJ, Kronberg MT, Clark MM, Rummans TA. Spiritual well-being and spiritual practices in elderly depressed psychiatric inpatients. *J Pastoral Care Counsel*. 2011; 65(1-2): 3: 1-11.

Craig N. Sawchuk, Ph.D.



Anxiety Disorders are among the most common mental health conditions in the United States, with an estimated economic burden of \$62 billion each year. Although effective interventions for anxiety disorders exist, many individuals with clinical anxiety do not seek assistance, experience significant barriers to accessing treatment, or receive substandard levels of care. Dr. Sawchuk has invested his career in exploring models and mechanisms that improve the dissemination of evidence-based treatments for anxiety disorders. As a member of our Division of Integrated Behavioral Health, he is developing novel, collaborative care efforts that enhance the accessibility and delivery of evidence-based pharmacotherapy and cognitive behavioral therapy in primary care settings. Future research efforts will focus on how technology can be tailored for larger-scale, population-based approaches for treating the range of clinical anxiety disorders.

KEY PUBLICATIONS

Sawchuk CN, Olatunji BO. Anxiety, health risk factors, and chronic disease. *Am J Lifestyle Med.* 2011; 5(6): 531-441.

Sawchuk CN, Roy-Byrne P, Noonan C, Bogart A, Goldberg J, Manson S, Buchwald D, AI-SUPERPPF Team. Smokeless tobacco use and its relation to panic disorder, major depression, and PTSD in American Indians. *Nicotine Tob Res.* 2012; 14(9): 1048-1056.

Sawchuk CN, Veitengruber J. "Panic disorder," in *British Medical Journal: Point of Care Series.* Epocrates Online.

Sawchuk CN, Veitengruber, J, Olatunji BO, Welch S. "Social anxiety disorder," in *British Medical Journal: Point of Care Series.*



Susannah J. Tye, Ph.D.

Dr. Tye focuses her research efforts on the role of stress hormones in mood regulation, with special emphasis on their role in regulating the therapeutic effects of antidepressants. Approximately 30% of patients with depression do not respond to first line antidepressant treatments and a key goal of the Mayo Clinic Depression Center and Translational Neuroscience Laboratory within the Department of Psychiatry and Psychology at Mayo Clinic is to drastically reduce this number. Dr. Tye's research will play an important role in this, as her team works towards establishing valid preclinical research models that can help us better understand why some patients do not respond to available antidepressant treatments. This will provide the basis for development of novel approaches for treating widespread, disabling mood disorders, and can be rapidly translated to the clinic through development of biomarker screens that enable more targeted and individualized patient care.

GRANTS

Brain and Behavior Research Foundation NARSAD YI Award: Mechanism of action of deep brain stimulation in neuropsychiatric conditions: neural circuitry, neurotransmission and synaptic plasticity. Funding period: 2009 – 2012; PI: Tye.

Deakin University: Collaborative Neuroscience and Neuropsychiatry Partnership. Funding Period 2012 – 2015; PI Tye.

L.E.W. Carty Charitable Trust: How do stress hormones alter antidepressant responses? Funding period: 2011 – 2012; PI: Tye.

State of Minnesota: Minnesota Partnership for Biotechnology: Harnessing imaging and genomics for clinical neuroscience of psychiatry. Funding period: 09/2012 – 09/2015; PI: Tye.

KEY PUBLICATIONS

Anderson RJ, Frye MA, Abulseoud OA, Lee KH, McGillivray JA, Berk M, Tye SJ. Deep Brain Stimulation for Treatment-Resistant Depression: Efficacy and Mechanisms of Action. *Neurosci Biobehav Rev.* 2012; 36(8): 1920-1933.

Chopra A, Tye SJ, Lee KH, Sampson S, Matsumoto J, Adams A, Klassen B, Stead M, Fields JA, Frye MA. Underlying Neurobiology and Clinical Correlates of Mania Status-Post Subthalamic Nucleus Deep Brain Stimulation in Parkinson's disease: A Review of the Literature. *J Neuropsychiatry Clin Neurosci.* 2012; 24(1): 102-110.

Tye SJ, Miller AD, Blaha CD. Ventral tegmental glutamate receptor stimulation of nucleus accumbens tonic dopamine efflux blunts hindbrain-evoked phasic neurotransmission: Implications for dopamine dysregulation disorders. *Neuroscience.*

Walker AJ, Burnett SA, Hasebe K, McGillivray JA, Gray LJ, McGee SL, Walder K, Berk M, Tye SJ. Chronic adrenocorticotrophic hormone treatment alters tricyclic antidepressant efficacy and prefrontal monoamine tissue levels. *Behav Brain Res.* 2013; 242: 76–83.

Marin Veldic, M.D.



Dr. Veldic is a *Mayo Clinic Scholar* who has a research interest in the molecular pathophysiology of mood disorders. His career objective is to integrate clinical phenotyping, genetic/epigenetic screening, and neuroimaging for individualized diagnosis and treatment of people living with mental illness. Dr. Veldic's current clinical research is a translational progression from his bench research on epigenetic regulation of the neuronal gene expression in mood disorders and psychosis.

The main project that Dr. Veldic is working on is an epigenetic study aimed at identifying potential clinical and molecular differences between bipolar disorder patients with and without comorbid binge eating disorder, nicotine dependence, and alcohol use disorder. Specifically, his study will evaluate how the expression of glutamate system genes is regulated in different phenotypical subtypes of bipolar disorder. Results of that study can potentially open new avenues for individualized treatment algorithms and enhance treatment outcomes for patients diagnosed with bipolar disorders. Dr. Veldic conducts his research under the mentorships of Dr. Mark Frye and Dr. Doo-Sup Choi.

GRANTS

American Psychiatric Association: DSM5 Field Trial. Funding period: 09/2010 – 10/2011. PI: Frye; Co-investigator: Veldic.

Mayo Clinic Center for Individualized Medicine Career Development Award: Epigenetic DNA Methylation in Patients with Bipolar Disorder with and Without Comorbid Addiction. Funding period: 07/2012 – 07/2015. PI: Veldic.

Tueting P, Davis JM, Veldic M, Pibiri F, Kadriu B, Guidotti A, Costa E. L-methionine decreases dendritic spine density in mouse frontal cortex. *Neuroreport*. 2010; 21 (8): 543-548.

Veldic M, Choi DS, Port JD, Biernacka JM, Sharp A, Meng P, Chia K, Mrazek D, Frye MA. Elevated Anterior Cingulate Glutamate Associated with SLC1A2 polymorphisms in patients with depression. *Biological Psychiatry*. 2010; 67 (9S): 130S.

KEY PUBLICATIONS

Biernacka JM, McElroy SL, Crow S, Sharp A, Benitez J, Veldic M, Kung S, Cunningham JM, Post RM, Mrazek D, Frye MA. Pharmacogenomics of antidepressant induced mania: A review and meta-analysis of the serotonin transporter gene (5HTTLPR) association. *J Affect Disord*. 2012; 136(1-2): e21-29.

Guidotti A, Dong E, Gavin DP, Veldic M, Zhao W, Bhaumik DK, Pandey SC, Grayson DR. DNA-methylation/demethylation network expression in psychotic patients with a history of alcohol abuse. *Alcohol Clin Exp Res*. 2013; 37(3): 417-424.

AWARDS & LEADERSHIP ROLES

American Psychiatric Association Research Colloquium for Junior Investigators (2011)

Society of Biological Psychiatry Travel Fellowship Award (2012)

Weinshilboum Prize for Pharmacogenomics, Mayo Clinic (2012)



Christopher A. Wall, M.D.

As novel assessment and treatment techniques of mood disorders emerge, Dr. Wall believes it is critically important to represent the pediatric population in these research initiatives. His career development awards will explore both assessment and intervention modalities of mood disorders for children and adolescents, requiring interdisciplinary collaboration, a strength of our clinical and research environment at Mayo Clinic. As an example, Dr. Wall's Klingenstein Third Generation Foundation Fellowship in Pediatric Depression allows our multispecialty team to study neurochemical treatment effects of repetitive transcranial magnetic stimulation (rTMS) in pediatric depression through the use of magnetic resonance spectroscopy. These study results will guide his recently funded Career Development award to perform the first-ever randomized controlled trial of rTMS in depressed adolescents. With these trials, we will better understand the role that rTMS may have as a potentially safe and effective treatment in this special population. Furthering the goals of identifying individualized assessment of complex child and adolescent mood disorders, Dr. Wall recently received a grant from the Mayo Clinic Center for Individualized Medicine to lead a multi-site team that will study oxidative stress in mitochondrial DNA of children from families at greatest risk for developing bipolar disorder.

GRANTS

Klingenstein Third Generation Foundation: An Open-Label Trial of Repetitive Transcranial Magnetic Stimulation in Depressed Adolescents: Mechanisms of Response. Funding period: 08/2011 – 07/2013; PI: Wall.

Paul and Betty Woolls Foundation (formerly the O'Shaughnessy Foundation): A Double-Blinded, Sham-Controlled Study Utilizing rTMS in Adolescents With Major Depressive Disorder.

Funding period: 7/2012 – 6/2015; PI: Wall.

Center for Individualized Medicine: An F1 at Risk Feasibility Study of Pediatric Bipolar Disorder: Mitochondrial Functioning and Neuroimaging Correlates. Funding period: 8/2012 – 8/2013; PI: Wall.

Croarkin PE, Wall CA, Lee J. Applications of transcranial magnetic stimulation (TMS) in child and adolescent psychiatry. *Int Rev Psychiatry*. 2011; 23(5):445-453.

Croarkin PE, Wall CA, Nakonezny PA, Buyukdura JS, Husain MM, Sampson SM, Emslie GJ, Kozel FA. Increased cortical excitability with prefrontal high-frequency repetitive transcranial magnetic stimulation in adolescents with treatment-resistant major depressive disorder. *J Child Adolesc Psychopharmacol*. 2012; 22(1): 56-64.

Wall CA, Croarkin PE, Sim LA, Husain MM, Janicak PG, Kozel FA, Emslie GJ, Dowd SM, Sampson SM. Adjunctive use of repetitive transcranial magnetic stimulation in depressed adolescents: a prospective, open pilot study. *J Clin Psychiatry*. 2011; 72(9): 1263-1269.

Wall CA, Croarkin PE, Swintak C, Koplin BA. Psychiatric pharmacogenomics in pediatric psychopharmacology. *Child Adolesc Psychiatr Clin N Am*. 2012; 21(4): 773-788.

KEY PUBLICATIONS

Baruth JM, Wall CA, Patterson MC, Port JD. Proton Magnetic Resonance Spectroscopy as a Probe into the Pathophysiology of Autism Spectrum Disorders (ASD): A Review. *Autism Res*. 2013.

Croarkin PE, Wall CA, King JD, Andrew Kozel F, Daskalakis ZJ. Pain during transcranial magnetic stimulation in youth. *Innov Clin Neurosci*. 2011; 8(12): 18-23.

AWARDS & LEADERSHIP ROLES

Member, Mayo Clinic Deep Brain Stimulation Committee

Member, National Network of Depression Centers Child and Adolescent Depression Work Group

Member, National Network of Depression Centers Transcranial Magnetic Stimulation Work Group

Ulas Camsari, MD, Addictions Fellow

Osama A. Abulseoud, MD, Mentor

Dr. Camsari has training in medical psychiatry and a background in basic neuroscience research using animal models. His current project focuses on studying the efficacy of ceftriaxone in reducing the severity of ethanol withdrawal manifestations and reducing pose-withdrawal voluntary consumption in rats. The project goal is to offer a safer alternative to the use of benzodiazepines for the management of alcohol withdrawal.



Salgado, Elmaadawi, Sterenson, Camsari

Ahmed Z. Elmaadawi, MD, Child Fellow

Peter S. Jensen, MD, Christopher A. Wall, MD, Co-Mentors

Dr. Elmaadawi's main research project involves analyzing pediatric bipolar variants and severe mood dysregulation using data from the NIMH Multimodal Treatment of Children with ADHD (MTA). The goal is to provide a better understanding of the relationship between phenotypical presentations and the longitudinal course of ADHD, pediatric bipolar variants, and possible subgroups that benefit from alternative treatment options. He is also currently involved in an open-label eight-week trial of repetitive transcranial magnetic stimulation in depressed adolescents studying the mechanisms of response via magnetic resonance spectroscopy.

Carlos A. Salgado, MD, Child Fellow

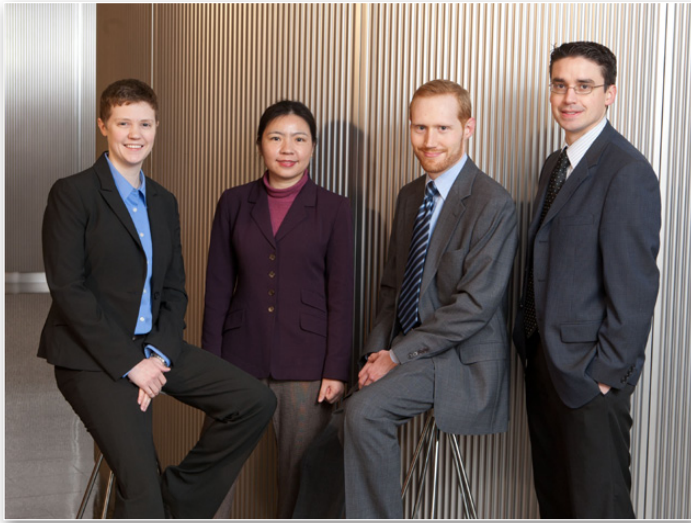
Cosima C. Swintak, MD, Mentor

Dr. Salgado's interests have focused on the use of technology to impact medical student and resident education. He is involved in a project that aims to provide greater exposure to child-adolescent psychiatry and complement existing curricula at various medical schools throughout the nation by using video-teleconferencing technology. The goal is to ultimately help address the chronic child psychiatry workforce shortage. Findings to date have led to presentations at national meetings, as well as a manuscript currently submitted for publication. Dr. Salgado is also interested in exploring the use of video-teleconferencing to target the expansion of resident education exposure to sub-specialty topics in psychiatry such as forensics.

Erin L. Sterenson, MD, Consult-Liaison Fellow

Tamara J. Dolenc, MD, Mentor

Dr. Sterenson has a particular interest in diabetes mellitus and comorbid psychiatric conditions. She is currently looking at what effect psychiatric illness may have on post-surgical outcomes of pancreas transplantation, including surgical complications, graft rejection and failure, and patient mortality in patients who have insulin-dependent diabetes. Dr. Sterenson has participated in a symposium at the annual meeting of the Academy of Psychosomatic Medicine, where she discussed the comorbidity of eating disorders and insulin-dependent diabetes. She has also been invited to present on this topic at the annual meeting of the American Psychiatric Association.



Vande Voort, Li, Lewis, Oesterle

Charles P. Lewis, MD, Resident Researcher

Paul E. Croarkin, DO, Mentor

Dr. Lewis has a research background in the study of child and adolescent mood disorders and adult substance use disorders utilizing neuroimaging techniques. His primary research interests are the neurobiological correlates of mood disorders and suicidal behavior in child and adolescent populations. His current project focuses on investigating biomarkers of suicidal risk in adolescents utilizing proton magnetic resonance spectroscopy to examine glutamate levels, as a potential adjunct in the clinical assessment of patients presenting with suicidal ideation or behaviors.

Xiaofan Li, MD, PhD, Resident Researcher

Doo-Sup Choi, PhD, Mentor

Dr. Li has a background in basic neuroscience research. She is interested in biological mechanisms related to the pathogenesis of various psychiatric disorders and treatment responses. Dr. Li has worked with a team of researchers to identify metabolite biomarkers for acamprosate treatment response among patients with alcohol dependence. A co-authored manuscript of "Hi Serum Glutamate Level Is Associated with Positive Response to Acamprosate Treatment" is in the process of submission. She is currently working on a project of metabolomic studies in preclinical models of psychotropic-induced metabolic syndrome.

Alastair J. McKean, MD, Resident Researcher

Mark A. Frye, MD, Osama A. Abulseoud, MD, Co-Mentors

Dr. McKean is presently serving as chief resident in his fourth and final year of general psychiatry residency. He is interested in the neurobiology of addictions and mood disorders. Through the use of magnetic resonance spectroscopy, he is currently investigating the phenomenology of high dose social drinkers. He will be presenting his findings during a poster session at the annual Society of Biological Psychiatry meeting. He has publications in *Clinical Chemistry, Pharmacoepidemiology, and Drug Safety*.

Tyler S. Oesterle, MD, Resident Researcher

Kathleen M. Logan, MD, Paul E. Croarkin, DO, Peter S. Jensen, MD, Co-Mentors

Dr. Oesterle's primary research focus includes substance abuse and co-occurring disorders in teens and adolescents. He is involved in several active research projects, which include investigating the use of lisdexamfetamine in the treatment of adolescents with attention deficit hyperactivity disorder and substance abuse and understanding trends in the pharmacologic management of major depression and substance abuse among teens. He also has an interest in research related to resident education with an abstract submitted for a poster presentation at the American Psychiatric Association annual meeting. Dr. Oesterle completed a research project looking at the use of ketamine in electroconvulsive therapy for depressed adults.

Asfia Qaadir, DO, Resident Researcher

Paul E. Croarkin, DO, Mentor

Dr. Qaadir has a prior research background in the study of childhood ADHD and candidate genes utilizing pharmacogenomics. She has presented a poster on the neuropsychiatric manifestations of SREAT at the American Association of Geriatric Psychiatry meeting. Dr. Qaadir also participated in a symposium at the American Academy of Child and Adolescent Psychiatry annual meeting focusing on the anatomy and physiology of GABA as it pertains to dysregulation in adolescent depression. Her current primary research focus is developing an evidence-based protocol for physician-led single-sex group psychotherapy for depressed/suicidal female adolescents on an acute inpatient behavioral unit. Ongoing clinical and research interests are the intersections between gender, developmental neurobiology, and psychotherapy.

Jennifer L. Vande Voort, MD, Resident Researcher

Peter S. Jensen, MD, Mentor

Dr. Vande Voort's primary research interests have included mood disorders and anxiety disorders among children and adolescents. Her current project focuses on youths who have received a diagnosis of bipolar disorder and the types of services they receive within the Mayo Clinic Health System. She has publications in several journals including the *Journal of ECT*, *Cognitive and Behavioral Practice*, *International Journal of Eating Disorders*, and *The American Journal of Gastroenterology*.



Medical Psychology Fellows

Chelsea M. Ale, PhD
Carrie A. Bronars, PhD
Melissa Castro Couch, PsyD
Jennifer M. Craft, PhD, LP
Marietta M. Hoogs, PhD
Jocelyn R. Lebow, PhD
Anilga Moradkhani, PhD
Brennan J. Young, PhD

*Back, left to right: Lebow, Young, Moradkhani, Craft, Ale
Seated: Castro Couch, Bronars*

Our Medical Psychology Fellowship Program has three specialty areas: Clinical Child Psychology, Clinical Health Psychology, and Clinical Neuropsychology. The research interests of our fellows include: Development and evaluation of theory-based interventions for tobacco cessation among psychiatric populations, understanding the interface of medical and psychiatric disorders, investigation of the implicit memory process in mild cognitive impairment, cognitive-behavioral treatment for anxiety disorders in children and adolescents, optimizing exposure-focused treatment for anxiety disorders, quality of life in patients with chronic health conditions, and neuropsychological comorbidities in patients with epilepsy.

GRANTS

National Cancer Institute: Biomarker feedback to motivate tobacco cessation in pregnant Alaska Native women. Funding period: 01/2010 – 12/2014; PI: Patten.

National Institute of Health: Healthy immigrant families: Observation of a multimedia youth group. Funding period: 01/02008 – 12/32015; PI: Wieland.

Mayo Clinic NIH Relief Grant Program: Supervised, vigorous intensity exercise intervention for depressed female smokers. Funding period 01/02011 – 12/32014; PI: Patten.

Mayo Clinic Department of Psychiatry and Psychology Small Grant: Adolescent Inpatient Hospitalization: Clinical Presentation and Course of Treatment. Funding period: 07/2011 – 06/2012; PI: Sim, Lebow, Young.

Mayo Clinic Department of Psychiatry and Psychology Small Grant: An Evaluation of an Online, Family-Based Indicated Prevention Program for Adolescent Eating Disorders. Funding period: 07/2011 – 06/2012; PI: Sim, Lebow.

KEY PUBLICATIONS

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Dr. Mrazek received his BA from Cornell University, his MD from Wake Forest University, his Residency in General Psychiatry at Cincinnati General Hospital, and a Fellowship in Child Psychiatry at University of Colorado Medical Center. During his career as an internationally known child psychiatrist, he worked at Institute of Psychiatry, King's College, London, Maudsley Hospital, London, and the National Jewish Medical and Research Center, Denver, Colorado. Dr. Mrazek then became Chair, Department of Psychiatry, George Washington University (1996 – 2000), and then was Chair, Department of Psychiatry and Psychology, Mayo Clinic from 2000 through 2010. He is a Fellow of the American Academy of Child & Adolescent Psychiatry, American College of Psychiatrists, American Psychological Society, Royal Society of Medicine, Royal College of Psychiatrists, and Society for Research in Child Development. He is a Professor of Psychiatry, Professor of Pediatrics, and Director of the S.C. Johnson Genomics of Addictions Program, Mayo Clinic.

During his career, Dr. Mrazek's research has been funded by the National Institute of General Medical Sciences, the National Human Genome Research Institute, the National Institute of Diabetes and Digestive and Kidney Diseases, the National Institute on Alcohol Abuse and Alcoholism, the Marriott Family Program in Individualized Medicine, American Academy of Child & Adolescent Psychiatry, the Obsessive Compulsive Foundation, and McNeil Consumer Healthcare. He has published over 130 scientific articles in peer reviewed journals including: *British Journal of Psychiatry*, *Journal of the American Medical Association*, *Pediatrics*, *Psychosomatics*, *American Journal of Psychiatry*, *Academic Psychiatry*, *Addiction Biology*, and *Pharmacogenetics and Genomics*. He has presented his research at numerous national and international professional societies and has mentored numerous residents, fellows and junior faculty members. He has made significant career contributions to the understanding of genetic factors in addictions and mood disorders.

Peter S. Jensen, M.D.



Dr. Jensen received his BS in Psychology from Brigham Young University, his MD from George Washington University School of Medicine, completed a residency in Psychiatry at Letterman Army Medical Center, and a Fellowship in Child & Adolescent Psychiatry at Letterman Army Medical Center/ University of California, San Francisco. He is a Professor of Psychiatry, and was Chair of Research, Mayo Clinic, Rochester, MN. He is also the President & CEO of the Resource for Advancing Children's Health (REACH), New York, NY. During his career, he worked at Eisenhower Army Medical Center, Medical College of Georgia, Walter Reed Army Institute, New York State Office of Mental Health, and the Center for the Advancement of Children's Mental Health, Columbia University. Additionally he was a Research Psychiatrist, Child & Adolescent Disorders Research Branch, National Institute of Mental Health and was Co-Chair of the Division of Child and Adolescent Psychiatry, Mayo Clinic. He is a Fellow in the American Psychiatric Association, and has served on numerous national committees including: American Academy of Child & Adolescent Psychiatry, Association for Clinical Psychosocial Research, Attention Deficit Disorders Association, U.S. Department of Health and Human Services, International Society for Research in Child and Adolescent, MacArthur Foundation, and National Institute of Mental Health.

In recognition of his scientific accomplishments, Dr. Jensen has served on the Editorial Boards of *Applied Developmental Science*, *Current Pediatric Reviews*, *Development and Psychopathology*, *Journal of Abnormal Child Psychology*, *Journal of Child and Adolescent Psychotherapy*, *Journal of the American Academy of Child and Adolescent Psychiatry*, *Psychiatric Services* and *Journal of Child Psychiatry and Psychology and Allied Disciplines*. In recognition of his teaching skills, he has received the Outstanding Mentor Award from the American Academy of Child and Adolescent Psychiatry on three occasions. His research has been funded by the Army Research Office, Marriott Family Program in Individualized Medicine, National Institute of Mental Health, and the Department of Education. He is a prolific writer and has published over 230 scientific papers in highly regarded journals including: *Archives of General Psychiatry*, *Journal of the Academy of Child and Adolescent Psychiatry*, *Military Medicine*, *American Journal of Psychiatry*, *Journal of Abnormal Child Psychology*, *Biological Psychiatry*, *Journal of Abnormal Psychology*, *Journal of Consulting and Clinical Psychology*, *Pediatrics*, and *Journal of the American Medical Association*. Given his scientific accomplishments, he has been an invited speaker across the globe. Dr. Jensen has made significant contributions to the diagnostic evaluation and treatment of mental health problems in children and adolescents.

