Neurology

Cincinnati Children's

Division Data Summary

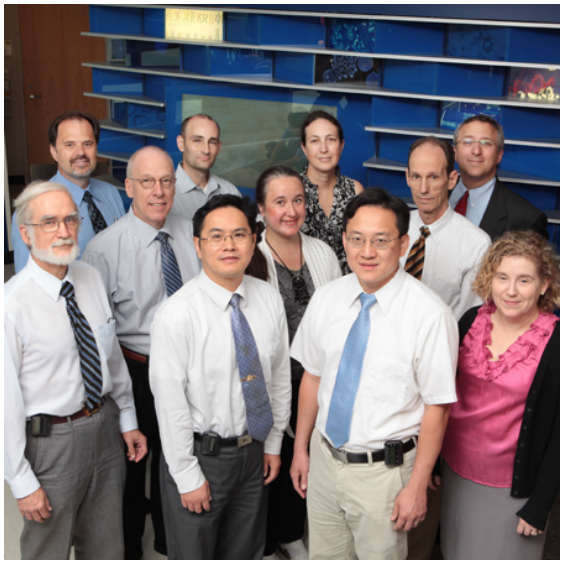
Research and Training Details

Number of Faculty	**30**
Number of Research Fellows	**5**
Number of Research Students	**4**
Number of Support Personnel	**121**
Direct Annual Grant Support	**$3,608,381**
Direct Annual Industry Support	**$2,182,897**
Peer Reviewed Publications	**54**

Clinical Activities and Training

Number of Clinical Staff	**1**
Number of Clinical Fellows	**1**
Inpatient Encounters	**2,060**
Outpatient Encounters	**22,918**

Division Photo



Row 1: D Rose, J Xiang, S Wu, A Byars
Row 2: T deGrauw, M Korostenskaja, M Schapiro
Row 3: A Hershey, H Greiner, B Hallinan, T Glauser

Significant Publications

Krueger DA, Care MM, Holland K, Agricola, K, Tudor C, Mangeshkar P, Wilson KA, Byars A, Sahmoud T, Franz DN. **Everolimus for subependymal giant-cell astrocytomas in tuberous sclerosis**. *N Engl J Med*. 363(19):1801-11. Nov 4, 2010.

This study demonstrated the effectiveness of everolimus in reducing subependymal giant-cell astrocytomas and with a single study lead to the FDA approval for this indication.

Seo JH, Holland K, Rose D, Rozhkov L, Fujiwara H, Byars A, Arthur T, DeGrauw T, Leach JL, Gelfand MJ, Miles L, Mangano FT, Horn P, Lee KH. **Multimodality imaging in the surgical treatment of children with nonlesional epilepsy**. *Neurology*. 76(1):41-8. 2011.

This study demonstrated the usefulness of multiple imaging techniques to identify the area of the brain for surgical resection when a classically defined lesion has not been identified.

Modi AC, Rausch JR, Glauser TA. **Patterns of nonadherence to antiepileptic drug therapy in children with newly diagnosed epilepsy**. *JAMA*. 305:1669-1676. 2011.

This study demonstrated the significant problem with AED adherence in children with epilepsy and the potential impact on treatment response.

Skelton MR, Schaefer TL, Graham DL, deGrauw TJ, Clark JF, Williams MT, Vorhees CV. **Creatine transporter (CrT; Slc6a8) knockout mice as a model of human CrT deficiency**. *PLoS One.* 6(1) 1-10 (e16187). 2011.

This is the first animal model of human creatine deficiency syndrome and was developed by our laboratory in mice using a floxed targeting strategy. The model shows the major biochemical and neurobehavioral phenotype of the human disorder and provides an opportunity to investigate the pathophysiology of this poorly understood disorder and to investigate treatment approaches that might someday be translated to

affected children.

Hershey AD, Burdine D, Kabbouche MA, Powers SW. **Genomic expression patterns in medication overuse headaches**. *Cephalalgia*. 31(2):161-71. Jan, 2011.

This study demonstrate a unique genomic profile in subjects with daily headaches and medication overuse that responded to cessation of overused medication from those subjects that did not respond to cessation of these agents, suggesting a unique molecular susceptability to overuse of medication.

Division Highlights

Movement Disorders Clinics/Tourette Syndrome Clinics

he Movement Disorder studies patients with tics, Tourette syndrome, dystonia, chorea, tremor, ataxia, and psychogenic movement disorders as well as ADHD and Stroke. Ongoing research includes studies of the neurological basis for ADHD and Tourette symptoms using Transcranial Magnetic Stimulation (TMS), as well as treatment studies for Tourette Syndrome, ADHD, and Stroke.

Comprehensive Epilepsy Program

The Comprehensive Epilepsy Program includes New Onset Seizure Clinics and Intractable Epilepsy Clinics. A major focus of the clinical research activities is the investigation of the role of drug-gene interactions on the individual variation in anti-epileptic drug clinical response. Research is under way examining both the role that genetic variation in drug metabolizing enzymes, drug transporters and drug receptors play in clinical response and the impact of medication on gene expression and the resulting relationship between gene expression and drug response. A NIH UO1 grant is a 32-center trial based out of Cincinnati Children's Hospital Medical Center and is the largest pediatric epilepsy trial ever funded in the United States continues to generate highly significant information on the management of children with epilepsy with recent highlights in medication adherence. The study is designed to better identify the pharmacokinetic, pharmacodynamic and pharmacogenetic factors that impact response to therapy.

Tuberous Sclerosis Program

This multispecialty program follows hundreds of patients with tuberous sclerosis but also patients with related disorders such as lymphangioleiomyomatosis (LAM). Through the pharmacological research efforts on everolimus and the understanding of the molecular nature of mTOR, research from the Tuberous Sclerosis Clinic lead to the FDA approval of everolimus for subependymal giant-cell astrocytomas and continues to build on the use of agents involved in mTor pathways for the treatment of neurological conditions.

Headache Center

Research in the Headache Center continues with emphasis on clinical trials and outcome studies. The blood genomic study on pediatric migraine is ongoing with publication of the effects of medication overuse and recent completion of studies on the menstrual effects of gene expression patterns in adolescents with menstrual-related migraine. Through combination with the MEG Center, a NIH sponsored study on the cortical effects of acute migraine has been developed with initial results demonstrating of cortical dysfunction toward complex task in children with migraine. In collaboration with the Division of Behavioral Medicine and Clinical Psychology, an NIH study investigation is near completion examining the role of coping skills training in the management of chronic migraine. Over the past year, a significant effort in collaboration with the Division of Behavioral Medicine and Clinical Psychology and Center for Clinical and Translation Research (Dr. Powers) and the Department of Biostatistics and Clinical Trials Statistical and Data Management Center at

the University of Iowa has resulted in the development of a multi-site study investigating the comparative effectiveness of amitriptyline and topiramate in the prevention of pediatric migraine.

Comprehensive Neuromuscular Center

The Comprehensive Neuromuscular Center has developed an interdisciplinary research program that integrates clinical, translational and basic research strategies. Our specialists participate in clinical trials, working to identify improved therapies. In one such study, our neuromuscular team collaborates with specialists from Endocrine division. to study the effects of Insulin Growth Factor 1 (IGF-1) on the muscle function of boys with Duchenne Muscular Dystrophy.

Neurobehavioral Animal Core (Vorhees and Williams lab)

During the past year we reported data showing for the first time that the Neuropeptide S receptor (NPSR1) in brain is the sole receptor mediating the anxiety, activity, and stress modulating effects of Neuropeptide S, an endogenous peptide that modulates mood and represents a target for the development of new therapeutics that may help correct mood disorders.

Division Collaboration

Human Genetics; Behavioral Medicine and Clinical Psychology; Psychiatry » Dr. T.A. Burrow; Dr. W. Lopez; Dr. E. Harris

Movement Disorders Clinic/Tourette's Disorder Clinic

Behavioral Medicine and Clinical Psychology; Neurosurgery; Pediatric Neuroimaging Research Consortium; Human Genetics; Radiology; Social Services » Drs. A. Modi, Shanna Guilfoyle; Dr. F. Mangano; Dr. S. Holland; Drs. G. Zhang, G. Grabowski, M. Keddache; Dr. J. Leach; M. Meyer, S. Fletcher

Comprehensive Epilepsy Program

Pulmonary Medicine; Nephrology; Plastic Surgery; Radiology; Neurosurgery; Cardiology; Human Genetics; Psychiatry » Drs. L. Young, F. McCormack; Dr. J. Bissler; Dr. C. Gordon; Drs. M. Care, J. Leach; Dr. K. Crone; Dr. T. Knilans; Dr. B. Schorry; Dr. D. Nelson

Tuberous Sclerosis Program

Behavioral Medicine and Clinical Psychology » Drs. S. Powers, A Lynch-Jordan, L. Crosby, S. Slater

Headache Center

Cardiology; Developmental and Behavioral Pediatrics; Nutrition; Human Genetics; Gastroenterology; Endocrinology; Orthopedics; Speech Therapy; Rehabilitative Medicine; Pulmonary; Physical Therapy; Pathology; Pediatric Surgery; Anesthesia & Palliative Care; Pain Services; Social Services; Translational Research; Nephrology » Drs. J. Towbin, JL Jefferies, R. Spicer, L. Cripe; Dr. D. Schonfeld; B. Godshall, D. Boutwell; M. Walker genetic counselor; Drs. A Kaul, N. Yazigi, A. Miethke; Drs. M. Rutter, S. Rose; Drs. J. McCarthy, V. Jain, P. Sturm; J. Linck; Dr. M. McMahon; Drs. R. Amin, H. Sawnani, J. Crisalli; A. McCormick, M. McGuire; Drs. L. Miles, K. Bove; Drs. R. Brown, T. Inge; Dr. N. Weidner, M. Meyer; Dr. K. Goldschneider; L. Demosthenes; Dr. J. Molkentin; Dr. E. Jackson

Comprehensive Neuromuscular Center

Sport Medicine; Physical Medicine & Rehabilitation » Drs. J. Divine, N. Edwards, M. Shaffer; B. Kurowski

Concussion Clinic

Neonatology & Pulmonary Biology » Drs. B. Haberman, T. Cahill, S. Merhar, T. Korfhagen, V. Narendran

Neonatal Follow-up Clinic

Pulmonary » Drs. N. Simakajornboon, M. Ednick, J. Crisalli, H. Sawnani, G. McPhail

Sleep Clinic

Human Genetics; Allergy & Immunology; Anesthesiology; Developmental Biology; Experimental Hematology » Drs. G. Grabowski, Y. Sun; Drs. M. Rothenberg, H. Zhu; Dr. S. Danzer, A. Lepke; Drs. K. Campbell, M. Nafafuku; Drs. R. Waclaw, L. Ehrman

Neurobehavioral Animal Core (Vorhees and Williams lab)

Rehabilitative Medicine » Drs. D. Pruitt, L. Michaud

Pediatric Demyelinating Disease Clinic

Speech Pathology; Pediatric Neuroimaging Research Consortium; Biomedical Informatics; Radiology; UC Neurology » Dr. E. Redle; Drs. S. Holland, V. Schmithorst; Dr. M. Wagner; Dr. Jean Tkach; Dr. Jerzy Szaflarski

Neuroimaging of Childhood Apraxia of Speech,

Cincinnati MR Imaging of Neural Development-(C-MIND study)

Faculty Members

Antonius DeGrauw, MD, PhD, Professor

Director Neurology Division

Research Interests Neurodevelopment, mitochondrial disorders

Todd Arthur, MD, Assistant Professor

Research Interests Brain concussion

Anna W Byars, PhD, Associate Professor

Research Interests Cognitive effects of epilepsy

James Collins, MD, PhD, Assistant Professor

Research Interests Congenital Muscular Dystrophy; Neuromuscular Disease

David Franz, MD, Professor

Director Tuberous Sclerosis program

Research Interests Tuberous sclerosis

Donald Gilbert, MD, Professor

Director Movement Disorders program
Director Neurology Residency Program

Research Interests Tourette syndrome, Transcranial Magnetic Stimulation (TMS)

Tracy A Glauser, MD, Professor

Director Comprehensive Epilepsy program

Research Interests Epilepsy, pharmacology

Barbara Hallinan, MD, Assistant Professor

Research Interests CSF steroid profiles

Andrew Hershey, MD, Professor

Director Headache Center

Research Interests Migraine, blood genomics

Katherine Holland-Bouley, MD, PhD, Assistant Professor

Research Interests Ion channels and epilepsy

Sarah Hopkins, MD, Assistant Professor

Research Interests White Matter Disease; Multiple Sclerosis

Sejal Jain, MD, Assistant Professor
Research Interests Epilepsy, sleep

Marielle A Kabbouche, MD, Assistant Professor
Research Interests Migraine

Milena Korostenskaja, PhD, Assistant Professor
Research Interests Mismatch negativity evoked response; changes in electrocorticogram during cognitive testing

Darcy Krueger, MD, Assistant Professor
Research Interests Tuberous Sclerosis

Ki Lee, MD, Associate Professor
Director EEG lab, EMU
Research Interests Epilepsy surgery

Diego Morita, MD, Assistant Professor
Research Interests Epilepsy, pharmacology

Hope O'Brien, MD, Assistant Professor
Research Interests Headaches

Douglas Rose, MD, Professor
Director, MEG lab
Research Interests Magneto-Encephalography (MEG)

Mark Schapiro, MD, Professor
Research Interests Neurodevelopmental disorders

Mary Sutton, MD, Assistant Professor
Research Interests Neuro-oncology

Shannon Standridge, DO, Assistant Professor
Research Interests Outcomes study, epilepsy

Cameron Thomas, MD, Assistant Professor
Research Interests Neonatal neurology

Jennifer Vannest, PhD, Assistant Professor
Research Interests Speech and language development

Charles Vorhees, PhD, Professor
Director Animal Neurobehavior Core
Research Interests Drugs/toxicants and brain development

Kristen Wesselkamper, MD, Assistant Professor
Research Interests Improvement science

Michael Williams, PhD, Associate Professor
Research Interests Drugs/toxicants and brain development

Brenda Wong, MD, Associate Professor
Director Neuromuscular program
Research Interests Duchenne's Muscular Dystrophy, Spinal Muscular Atrophy

Steve Wu, MD, Assistant Professor
Research Interests Movement Disorder; Transcranial Magnetic Stimulation (TMS)

Jing Xiang, MD, PhD, Associate Professor
Director MEG Research program
Research Interests MEG

Clinical Staff Members

- Irina Rybalsky, MD

Trainees

- Alice Lawrence, MD, PGYVI, Milton S. Hershey Medical Center
- Jan-Mendelt Tillema, MD, PGYV, St. Radboud University Nijmegen, The Netherlands
- Laura Lehman, MD, PGYV, University of Cincinnati
- Jeffrey Tenney, MD, PGYV, University of Massachusetts Medical School
- Jamie Capal, MD, PGYV, Albany Medical College
- Holly Hoenes, MD, PGYIV, Mercer University
- Andrea Pardo, MD, PGYIV, Universidad del Rosario
- John Pugh, MD, PGYIV, Boston University
- Tanishia Williams, MD, PGYIV, University of Medicine & Dentistry of New Jersey
- Thomas Dye, MD, PGYIII, St. Louis University
- Nina Natarajan, MD, PGYIII, University of Cincinnati
- Katrina Peariso, MD, PGYIII, University of New Mexico
- Sarah Weatherspoon, MD, PGYIII, University of Texas Southwestern

Significant Accomplishments

MEG Laboratory

The Magnetoencephalography (MEG) Center, created in 2006, noninvasively measures magnetic fields created by the brain's electrical activity and provides high spatiotemporal information about functional brain activity. MEG is now used to map epileptogenic foci and eloquent brain function for pre-operative evaluation of epilepsy surgery, and hundreds of patients have benefited. Researchers at the MEG Center have developed 17 collaborative projects including the study of language function of the developing brain, identification of neuromagnetic abnormalities in migraine and localization of epileptic foci with high-frequency oscillations. Supported by a Trustee Grant and two National Institutes of Health grants, the research team has published about 26 MEG papers in peer-reviewed journals. Within five years, our program has become one of the leading clinical MEG sites in the world. We have trained 10 MEG scientists, six of whom have become department or lab directors at their hospitals or institutions.

Neuromuscular Program

The Comprehensive Neuromuscular Care Center has distinguished itself as a center of excellence for the management and care of our patients. The center provides comprehensive interdisciplinary care for optimal outcomes in patients from all over the United States and other countries with pediatric neuromuscular disorders, in particular Duchenne muscular dystrophy.

Besides the teaching and education of pediatric and neurology resident staff, the program has also been successful in the training of pediatric neuromuscular specialists who are now working at other pediatric institutions. The program is active in translational and clinical neuromuscular research. In particular, it brings

together other specialties in collaborative research projects and clinical trials in Duchenne muscular dystrophy.

Division Publications

1. Austin JK, Perkins SM, Johnson CS, Fastenau PS, Byars AW, deGrauw TJ, Dunn DW. **Self-esteem and symptoms of depression in children with seizures: relationships with neuropsychological functioning and family variables over time**. *Epilepsia*. 2010; 51:2074-83.
2. Braun AA, Herring NR, Schaefer TL, Hemmerle AM, Dickerson JW, Seroogy KB, Vorhees CV, Williams MT. **Neurotoxic (+)-methamphetamine treatment in rats increases brain-derived neurotrophic factor and tropomyosin receptor kinase B expression in multiple brain regions**. *Neuroscience*. 2011; 184:164-71.
3. Braun AA, Skelton MR, Vorhees CV, Williams MT. **Comparison of the elevated plus and elevated zero mazes in treated and untreated male Sprague-Dawley rats: effects of anxiolytic and anxiogenic agents**. *Pharmacol Biochem Behav*. 2011; 97:406-15.
4. Chen Y, Xiang J, Kirtman EG, Wang Y, Kotecha R, Liu Y. **Neuromagnetic biomarkers of visuocortical development in healthy children**. *Clin Neurophysiol*. 2010; 121:1555-62.
5. Curran CP, Vorhees CV, Williams MT, Genter MB, Miller ML, Nebert DW. **In utero and lactational exposure to a complex mixture of polychlorinated biphenyls: toxicity in pups dependent on the Cyp1a2 and Ahr genotypes**. *Toxicol Sci*. 2011; 119:189-208.
6. Dalal P, Leslie ND, Lindor NM, Gilbert DL, Espay AJ. **Motor tics, stereotypies, and self-flagellation in primrose syndrome**. *Neurology*. 2010; 75:284-6.
7. Dunn DW, Johnson CS, Perkins SM, Fastenau PS, Byars AW, deGrauw TJ, Austin JK. **Academic problems in children with seizures: relationships with neuropsychological functioning and family variables during the 3 years after onset**. *Epilepsy Behav*. 2010; 19:455-61.
8. Franz DN, Bissler JJ, McCormack FX. **Tuberous sclerosis complex: neurological, renal and pulmonary manifestations**. *Neuropediatrics*. 2010; 41:199-208.
9. Gilbert DL, Isaacs KM, Augusta M, Macneil LK, Mostofsky SH. **Motor cortex inhibition: a marker of ADHD behavior and motor development in children**. *Neurology*. 2011; 76:615-21.
10. Graham DL, Grace CE, Braun AA, Schaefer TL, Skelton MR, Tang PH, Vorhees CV, Williams MT. **Effects of developmental stress and lead (Pb) on corticosterone after chronic and acute stress, brain monoamines, and blood Pb levels in rats**. *Int J Dev Neurosci*. 2011; 29:45-55.
11. Greiner H, Leach JL, Lee KH, Krueger DA. **Anti-NMDA receptor encephalitis presenting with imaging findings and clinical features mimicking Rasmussen syndrome**. *Seizure*. 2011; 20:266-70.
12. Greiner HM, Abruzzo TA, Kabbouche M, Leach JL, Zuccarello M. **Rotational vertebral artery occlusion in a child with multiple strokes: a case-based update**. *Childs Nerv Syst*. 2010; 26:1669-74.
13. Herring NR, Gudelsky GA, Vorhees CV, Williams MT. **(+)-Methamphetamine-induced monoamine reductions and impaired egocentric learning in adrenalectomized rats is independent of hyperthermia**. *Synapse*. 2010; 64:773-85.
14. Hershey AD, Burdine D, Kabbouche MA, Powers SW. **Genomic expression patterns in medication overuse headaches**. *Cephalalgia*. 2011; 31:161-71.
15. Hershey AD, Kabbouche MA, Powers SW. **Treatment of pediatric and adolescent migraine**. *Pediatr Ann*. 2010; 39:416-23.
16. Huo X, Wang Y, Kotecha R, Kirtman EG, Fujiwara H, Hemasilpin N, Degrauw T, Rose DF, Xiang J. **High gamma oscillations of sensorimotor cortex during unilateral movement in the developing brain: a MEG study**. *Brain Topogr*. 2011; 23:375-84.
17. Huo X, Xiang J, Wang Y, Kirtman EG, Kotecha R, Fujiwara H, Hemasilpin N, Rose DF, Degrauw T. **Gamma**

oscillations in the primary motor cortex studied with MEG. *Brain Dev*. 2010; 32:619-24.

18. Jain SV, Simakajornboon S, Shapiro SM, Morton LD, Leszczyszyn DJ, Simakajornboon N. **Obstructive sleep apnea in children with epilepsy: prospective pilot trial**. *Acta Neurol Scand*. 2011; .
19. Karunanayaka P, Schmithorst VJ, Vannest J, Szaflarski JP, Plante E, Holland SK. **A linear structural equation model for covert verb generation based on independent component analysis of FMRI data from children and adolescents**. *Front Syst Neurosci*. 2011; 5:29.
20. Kohli R, Kirby M, Xanthakos SA, Softic S, Feldstein AE, Saxena V, Tang PH, Miles L, Miles MV, Balistreri WF, Woods SC, Seeley RJ. **High-fructose, medium chain trans fat diet induces liver fibrosis and elevates plasma coenzyme Q9 in a novel murine model of obesity and nonalcoholic steatohepatitis**. *Hepatology*. 2010; 52:934-44.
21. Korostenskaja M, Pardos M, Fujiwara H, Kujala T, Horn P, Rose D, Byars A, Brown D, Seo JH, Wang Y, Vannest J, Xiang J, Degrauw T, Naatanen R, Lee KH. **Neuromagnetic evidence of impaired cortical auditory processing in pediatric intractable epilepsy**. *Epilepsy Res*. 2010; 92:63-73.
22. Krueger DA, Care MM, Holland K, Agricola K, Tudor C, Mangeshkar P, Wilson KA, Byars A, Sahmoud T, Franz DN. **Everolimus for subependymal giant-cell astrocytomas in tuberous sclerosis**. *N Engl J Med*. 2010; 363:1801-11.
23. Leckman JF, King RA, Gilbert DL, Coffey BJ, Singer HS, Dure LSt, Grantz H, Katsovich L, Lin H, Lombroso PJ, Kawikova I, Johnson DR, Kurlan RM, Kaplan EL. **Streptococcal upper respiratory tract infections and exacerbations of tic and obsessive-compulsive symptoms: a prospective longitudinal study**. *J Am Acad Child Adolesc Psychiatry*. 2011; 50:108-118 e3.
24. Liao IH, Corbett BA, Gilbert DL, Bunge SA, Sharp FR. **Blood gene expression correlated with tic severity in medicated and unmedicated patients with Tourette Syndrome**. *Pharmacogenomics*. 2010; 11:1733-41.
25. Macneil LK, Xavier P, Garvey MA, Gilbert DL, Ranta ME, Denckla MB, Mostofsky SH. **Quantifying excessive mirror overflow in children with attention-deficit/hyperactivity disorder**. *Neurology*. 2011; 76:622-8.
26. Meng L, Xiang J, Kotecha R, Rose D, Zhao H, Zhao D, Yang J, Degrauw T. **White matter abnormalities in children and adolescents with temporal lobe epilepsy**. *Magn Reson Imaging*. 2010; 28:1290-8.
27. Miles MV, Putnam PE, Miles L, Tang PH, DeGrauw AJ, Wong BL, Horn PS, Foote HL, Rothenberg ME. **Acquired coenzyme Q10 deficiency in children with recurrent food intolerance and allergies**. *Mitochondrion*. 2011; 11:127-35.
28. Modi AC, Guilfoyle SM, Morita DA, Glauser TA. **Development and reliability of a correction factor for parent-reported adherence to pediatric antiepileptic drug therapy**. *Epilepsia*. 2011; 52:370-6.
29. Modi AC, Ingerski LM, Rausch JR, Glauser TA. **Treatment factors affecting longitudinal quality of life in new onset pediatric epilepsy**. *J Pediatr Psychol*. 2011; 36:466-75.
30. Modi AC, Rausch JR, Glauser TA. **Patterns of nonadherence to antiepileptic drug therapy in children with newly diagnosed epilepsy**. *JAMA*. 2011; 305:1669-76.
31. Qin W, Chan JA, Vinters HV, Mathern GW, Franz DN, Taillon BE, Bouffard P, Kwiatkowski DJ. **Analysis of TSC cortical tubers by deep sequencing of TSC1, TSC2 and KRAS demonstrates that small second-hit mutations in these genes are rare events**. *Brain Pathol*. 2010; 20:1096-105.
32. Ridel KR, Gilbert DL. **Child neurology: past, present, and future: part 3: the future**. *Neurology*. 2010; 75:e62-4.
33. Sanger TD, Chen D, Fehlings DL, Hallett M, Lang AE, Mink JW, Singer HS, Alter K, Ben-Pazi H, Butler EE, Chen R, Collins A, Dayanidhi S, Forssberg H, Fowler E, Gilbert DL, Gorman SL, Gormley ME, Jr., Jinnah HA, Kornblau B, Krosschell KJ, Lehman RK, MacKinnon C, Malanga CJ, Mesterman R, Michaels MB,

Pearson TS, Rose J, Russman BS, Sternad D, Swoboda KJ, Valero-Cuevas F. **Definition and classification of hyperkinetic movements in childhood**. *Mov Disord*. 2010; 25:1538-49.

34. Schaefer TL, Grace CE, Gudelsky GA, Vorhees CV, Williams MT. **Effects on plasma corticosterone levels and brain serotonin from interference with methamphetamine-induced corticosterone release in neonatal rats**. *Stress*. 2010; 13:469-80.
35. Schaefer TL, Lingrel JB, Moseley AE, Vorhees CV, Williams MT. **Targeted mutations in the Na,K-ATPase alpha 2 isoform confer ouabain resistance and result in abnormal behavior in mice**. *Synapse*. 2011; 65:520-31.
36. Seo JH, Holland K, Rose D, Rozhkov L, Fujiwara H, Byars A, Arthur T, DeGrauw T, Leach JL, Gelfand MJ, Miles L, Mangano FT, Horn P, Lee KH. **Multimodality imaging in the surgical treatment of children with nonlesional epilepsy**. *Neurology*. 2011; 76:41-8.
37. Seshia SS, Wang SJ, Abu-Arafeh I, Hershey AD, Guidetti V, Winner P, Wober-Bingol C. **Chronic daily headache in children and adolescents: a multi-faceted syndrome**. *Can J Neurol Sci*. 2010; 37:769-78.
38. Skelton MR, Schaefer TL, Graham DL, Degrauw TJ, Clark JF, Williams MT, Vorhees CV. **Creatine transporter (CrT; Slc6a8) knockout mice as a model of human CrT deficiency**. *PLoS One*. 2011; 6:e16187.
39. Soltanzadeh P, Friez MJ, Dunn D, von Niederhausern A, Gurvich OL, Swoboda KJ, Sampson JB, Pestronk A, Connolly AM, Florence JM, Finkel RS, Bonnemann CG, Medne L, Mendell JR, Mathews KD, Wong BL, Sussman MD, Zonana J, Kovak K, Gospe SM, Jr., Gappmaier E, Taylor LE, Howard MT, Weiss RB, Flanigan KM. **Clinical and genetic characterization of manifesting carriers of DMD mutations**. *Neuromuscul Disord*. 2010; 20:499-504.
40. Stafstrom CE, Arnason BG, Baram TZ, Catania A, Cortez MA, Glauser TA, Pranzatelli MR, Riikonen R, Rogawski MA, Shinnar S, Swann JW. **Treatment of Infantile Spasms: Emerging Insights From Clinical and Basic Science Perspectives**. *J Child Neurol*. 2011; .
41. Standridge SM. **Idiopathic intracranial hypertension in children: a review and algorithm**. *Pediatr Neurol*. 2010; 43:377-90.
42. Szaflarski JP, Vannest J, Wu SW, DiFrancesco MW, Banks C, Gilbert DL. **Excitatory repetitive transcranial magnetic stimulation induces improvements in chronic post-stroke aphasia**. *Med Sci Monit*. 2011; 17:CR132-9.
43. Tenney JR, Hopkin RJ, Schapiro MB. **Deletion of 14-3-3{varepsilon} and CRK: a clinical syndrome with macrocephaly, developmental delay, and generalized epilepsy**. *J Child Neurol*. 2011; 26:223-7.
44. Tiberio D, Franz DN, Phillips JR. **Regression of a cardiac rhabdomyoma in a patient receiving everolimus**. *Pediatrics*. 2011; 127:e1335-7.
45. Vannest J, Newport EL, Newman AJ, Bavelier D. **Interplay between morphology and frequency in lexical access: the case of the base frequency effect**. *Brain Res*. 2011; 1373:144-59.
46. Vannest J, Rasmussen J, Eaton KP, Patel K, Schmithorst V, Karunanayaka P, Plante E, Byars A, Holland S. **FMRI activation in language areas correlates with verb generation performance in children**. *Neuropediatrics*. 2010; 41:235-9.
47. Vorhees CV, He E, Skelton MR, Graham DL, Schaefer TL, Grace CE, Braun AA, Amos-Kroohs R, Williams MT. **Comparison of (+)-methamphetamine, +/--methylenedioxymethamphetamine, (+)-amphetamine and +/--fenfluramine in rats on egocentric learning in the Cincinnati water maze**. *Synapse*. 2011; 65:368-78.
48. Wang Y, Xiang J, Vannest J, Holroyd T, Narmoneva D, Horn P, Liu Y, Rose D, Degrauw T, Holland S. **Neuromagnetic measures of word processing in bilinguals and monolinguals**. *Clin Neurophysiol*. 2011; .
49. Wu SW, Gilbert DL. **Gilles de la Tourette Syndrome**. *Conn's Current Therapy 2011.* Philadelphia: W.B.

Saunders; 2011: 947-950. .
50. Wu SW, Harris E, Gilbert DL. **Tic suppression: the medical model**. *J Child Adolesc Psychopharmacol*. 2010; 20:263-76.
51. Young LR, Vandyke R, Gulleman PM, Inoue Y, Brown KK, Schmidt LS, Linehan WM, Hajjar F, Kinder BW, Trapnell BC, Bissler JJ, Franz DN, McCormack FX. **Serum vascular endothelial growth factor-D prospectively distinguishes lymphangioleiomyomatosis from other diseases**. *Chest*. 2010; 138:674-81.
52. Zender M, Pestian JP, Glauser TA. **Visual Language System for Representing Medical Concepts**. *Information Design Journal*. 2010; 18:184-197.
53. Zhang F, Hammer T, Banks HL, Benson C, Xiang J, Fu QJ. **Mismatch negativity and adaptation measures of the late auditory evoked potential in cochlear implant users**. *Hear Res*. 2011; 275:17-29.
54. Zhu H, Mingler MK, McBride ML, Murphy AJ, Valenzuela DM, Yancopoulos GD, Williams MT, Vorhees CV, Rothenberg ME. **Abnormal response to stress and impaired NPS-induced hyperlocomotion, anxiolytic effect and corticosterone increase in mice lacking NPSR1**. *Psychoneuroendocrinology*. 2010; 35:1119-32.

Grants, Contracts, and Industry Agreements

Grant and Contract Awards		Annual Direct / Project Period Direct
GILBERT, D		
The Role of SLITRK1 in Tourette and Related Disorders		
National Institutes of Health(Yale University School of Medicine)		
R01 NS 056276	09/01/06-08/31/11	$21,206
GLAUSER, T		
Impact of Initial Therapy and Response on Long Term Outcome in Children with CAE		
National Institutes of Health		
U01 NS 045911	09/01/10-08/31/14	$2,432,985
Epilepsy Phenome/Genome Project (EPGP)		
National Institutes of Health(The Univ of California, San Francisco)		
U01 NS 053998	07/01/10-06/30/11	$115,911
HOLLAND-BOULEY, K		
Sodium Channel Gene Variation in the Treatment of Epilepsy		
National Institutes of Health		
R01 NS 062756	04/01/09-03/31/14	$196,875
O'BRIEN, H		
AHS/Merck US Human Health Headache Specialty Fellowship		
American Headache Society		
	07/01/09-06/30/11	$40,000
SCHIBLER, K		
NICHD Cooperative Multi-Center Neonatal Research Network		
National Institutes of Health(RTI International)		
U10 HD 027853	07/01/10-06/30/11	$59,592
TENNEY, J		
Mapping the Epileptic Network of Childhood Absence Seizures		
CURE Epilepsy		
	02/01/11-01/31/12	$100,000

TRAPNELL, B

Quantum- 1 Study
Alpha One Foundation
07/01/10-06/30/11 $15,926

VORHEES, C

Training Grant in Teratology
National Institutes of Health
T32 ES 07051 07/01/07-06/30/12 $265,370

WILLIAMS, M

Effects of Lead, Manganese and Stress During Development
National Institutes of Health
R01 ES 015689 09/18/06-06/30/11 $235,516

XIANG, J

Motor Cortex Dysfunction in Migraine
National Institutes of Health
R21 NS 072817 09/01/10-08/31/12 $125,000

Current Year Direct $3,608,381

Industry Contracts

FRANZ, D

Novartis Pharmaceuticals $1,362,013

GILBERT, D

Otsuka America Pharmaceutical, Inc $96,116
Psyadon Pharmaceuticals, Inc. $33,649

HERSHEY, A

Endo Pharmaceuticals, Inc. $59,303
GlaxoSmithKline $6,878
Palm Beach Neurology $9,625

HOLLAND-BOULEY, K

Novartis Pharmaceuticals $122,456

KRUEGER, D

Novartis Pharmaceuticals $205,618

VORHEES, C

Eli Lilly and Company $15,045

WONG, B

PTC Therapeutics, Inc. $145,657
Genethon $126,537

Current Year Direct Receipts $2,182,897

Total $5,791,278