

**Division Photo**



*First Row: Shannon Standridge, Jing, Xiang, Michael Miles, Ton deGrauw, Cindy Molloy, Jennifer Vannest, Anna Byars; Second Row Diego Morita, Donald Gilbert, Charles Vorhees, Barbara Hallinan, Tracy Glauser, Ki Lee, Mark Schapiro, Paul Horn*

**Division Data Summary**

**Research and Training Details**

Number of Faculty	25
Number of Joint Appointment Faculty	2
Number of Research Fellows	4
Number of Research Students	5
Number of Support Personnel	131
Direct Annual Grant Support	\$1,579,195
Direct Annual Industry Support	\$515,469
Peer Reviewed Publications	64

**Clinical Activities and Training**

Number of Clinical Staff	2
Number of Clinical Fellows	5
Number of Clinical Students	3
Number of Other Students	11
Inpatient Encounters	2,532
Outpatient Encounters	20,663

**Significant Publications**

**Arthur TM, DeGrauw TJ, Johnson CS, Perkins SM, Kalnin A, Austin JK, Dunn DW, Seizure recurrence risk following a first seizure in neurologically normal children, *Epilepsia*, 2008, 49:1950-1954.**

We found a high risk of seizure recurrence (66%) in this group of 150 children. Abnormal EEG and abnormal MRI did not predict seizure recurrence.

**Hershey AD, Burdine D, Liu C, Nick TG, Gilbert DL, Glauser TA, Assessing quality and normalization of**

### **microarrays: case studies using neurological genomic data, Acta Neurol Scand, 2008, 29-41**

This is part of our effort to use blood genomics for the study of neurological disorders. This paper addresses sensitivity and specificity issues in patients with migraine and new onset epilepsy.

### **Miles MV, Miles L, Tang PH, Horn PS, Steele PE, DeGrauw TJ, Wong BL, Bove KE, systematic evaluation of muscle coenzyme Q10 content in children with mitochondrial respiratory chain enzyme deficiencies, Mitochondrion, 2008, 8:170-180**

A study of CoQ10 content in muscle of children with clinical and biochemical evidence of mitochondrial disease. Low total CoQ10 was associated with Electron Transport Chain deficiencies.

### **Xiang J, Liu Y, Wang Y, Kotecha R, Kirtman EG, Chen Y, Huo X, Fujiwara H, Hemasilpin N, DeGrauw TJ, Rose D, Neuromagnetic correlates of developmental changes in endogenous high-frequency brain oscillations in children: a wavelet-based beamformer study, Brain Res. 2009, 1274:28-39.**

Our first paper on high frequency brain oscillations in children: developmental patterns. This is the basis for our current studies of high frequency brain oscillations in children with epilepsy.

### **DeRoos ST, Chillag KI, Keeler M, Gilbert DL, Effects of sleep deprivation on the pediatric electroencephalogram, Pediatrics, 2009, 123:703-708.**

Evaluation of a practice guideline to obtain sleep deprived EEG's in new onset epilepsy. We found that sleep deprivation increases the yield of abnormalities on the EEG from 32% to 44% compared to routine EEG's.

## **Division Highlights**

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### **Vorhees CV, PhD and Williams MT, PhD**

Ongoing studies of the effects of neonatal +methamphetamine exposure on learning and behavior in rats. Our studies address the critical period and dose of drug exposure on learning/behavior. A number of papers was published on this throughout the year.

## **Division Collaboration**

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### **Collaboration with cardiology; pulmonary medicine; rehabilitation; orthopedics; endocrinology**

**Collaborating Faculty: R. Spicer, MD; L. Cripe, MD; R. Amin, MD; M. McMahon, MD; T. Do, MD; M. Rutter, MD**

Multispecialty clinic in neuromuscular disorders, B. Wong, MD, clinical trials, clinical research

### **Collaboration with nephrology; cardiology; psychiatry**

**Collaborating Faculty: J. Bissler, MD; T. Knilans, MD; D. Nelson, MD**

Tuberous Sclerosis program (D. Franz, MD and D. Krueger, MD). Multispecialty clinic, translational and clinical research studies.

### **Collaboration with psychology**

**Collaborating Faculty: S. Powers, PhD and others**

Headache Center (A. Hershey, MD, M. Kabbouche, MD). Multispecialty clinic, clinical trials, translational and clinical research, improvement science

### **Collaboration with radiology; nuclear medicine; neurosurgery**

**Collaborating Faculty: J. Leach, MD; M. Gelfand, MD; F. Mangano, MD**

Epilepsy Surgery Program (K. Lee, MD, K. Holland, MD, PhD). Multispecialty clinical service, outcome studies, integration of imaging and neurophysiology techniques to improve localization of seizure focus, mapping of cognitive function

### **Collaboration with psychology; genetics; clinical pharmacology**

**Collaborating Faculty: A. Modi, PhD; G. Grabowski, MD; A. Vinks, PhD**

Epilepsy pharmacology (T. Glauser, MD, D. Morita, MD). clinical pharmacology, pharmacogenetics, pharmacodynamics, pharmacogenomics, adherence to Anti-Epileptic Drugs.

## **Faculty Members**

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**Antonius DeGrauw, MD, PhD, Professor ; Director Neurology Division**

**Research Interests:** Neurodevelopment, mitochondrial disorders

**Todd Arthur, MD**, Assistant Professor Clinical  
**Research Interests:** Brain concussion

**Anna W Byars, PhD**, Associate Professor Clinical  
**Research Interests:** Cognitive effects of epilepsy

**David Franz, MD**, Professor Clinical ; *Director Tuberous Sclerosis program*  
**Research Interests:** Tuberous sclerosis

**Donald Gilbert, MD**, Associate Professor Clinical ; *Director Movement Disorders program*  
**Research Interests:** Tourette syndrome, Transcranial Magnetic Stimulation (TMS)

**Tracy A Glauser, MD**, Professor Clinical ; *Director Comprehensive Epilepsy program*  
**Research Interests:** Epilepsy, pharmacology

**Barbara Hallinan, MD**, Assistant Professor Clinical  
**Research Interests:** CSF steroid profiles

**Andrew Hershey, MD**, Professor Clinical ; *Director Headache Center*  
**Research Interests:** Migraine, blood genomics

**Katherine Holland-Bouley, MD, PhD**, Assistant Professor Clinical  
**Research Interests:** Ion channels and epilepsy

**Sejal Jain, MD**, Assistant Professor Clinical  
**Research Interests:** Epilepsy, sleep

**Marielle A Kabbouche, MD**, Assistant Professor Clinical  
**Research Interests:** Migraine

**Darcy Krueger, MD**, Assistant Professor Clinical  
**Research Interests:** Tuberous Sclerosis

**Ki Lee, MD**, Associate Professor Clinical ; *Director EEG lab, EMU*  
**Research Interests:** Epilepsy surgery

**Cindy Molloy, MD**, Assistant Professor Clinical  
**Research Interests:** Autism

**Diego Morita, MD**, Assistant Professor Clinical  
**Research Interests:** Epilepsy, pharmacology

**Douglas Rose, MD**, Professor Clinical ; *Director MEG lab*  
**Research Interests:** Magneto-Encephalography (MEG)

**Mark Schapiro, MD**, Professor Clinical ; *Director Neurology Residency program*  
**Research Interests:** Neurodevelopmental disorders

**Mary Sutton, MD**, Assistant Professor Clinical  
**Research Interests:** Neuro-oncology

**Shannon Standridge, DO**, Assistant Professor Clinical  
**Research Interests:** Outcomes study, epilepsy

**Jennifer Vannest, PhD**, Research 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 Clinical  
**Research Interests:** Improvement science

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

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

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

## Clinical Staff Members

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- Tina Narayan, MD
- Irina Rybalsky, MD

## Trainees

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- **Marc DiSabella, DO**, PGY-VI, Cooper University Hospital
- **Pierre Fequiere, MD**, PGY-VI, Long Island College Hospital
- **Steve Wu, MD**, PGY-VI, Vanderbilt University
- **James Collins, MD**, PGY-V, University of Cincinnati
- **Sarah Hopkins, MD**, PGY-V, University of Arkansas
- **Laurel Malinowski, MD**, PGY-V, University of Wisconsin
- **Alice Lawrence, MD**, PGYIV, Milton S. Hershey Medical Center
- **Cameron Thomas, MD**, PGYIV, University of Colorado
- **Shawn Aylward, MD**, PGYIV, Southern Illinois University
- **Keith Ridel, MD**, PGYIV, University of Cincinnati
- **Jan-Mendelt Tillema, MD**, PGYIII, St. Radboud University Nijmegen, The Netherlands
- **Laura Lehman, MD**, PGYIII, University of Cincinnati
- **Jeffrey Tenney, MD**, PGYIII, University of Massachusetts Medical School
- **Jamie Fountain, MD**, PGYIII, Albany Medical College

## Significant Accomplishments

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### Childhood Absence Epilepsy: RX, PK-PD Pharmacogenetics

The Childhood Absence Epilepsy Study (NS045911) is a 32 center, 453 patient, double blind, randomized parallel group study developed and directed by Tracy A. Glauser, MD, director of the Comprehensive Epilepsy Center in the Division of Neurology. This study, the largest NIH funded pediatric epilepsy trial ever conducted, aimed to identify the optimal anticonvulsant used for the initial treatment of children with untreated childhood absence epilepsy, a common pediatric epilepsy syndrome. The study sought to determine the pharmacogenetic factors underlying the inter-individual variation in drug response along with defining and contrasting the effects of ethosuximide, lamotrigine, and valproic acid monotherapy on cognition (attention), behavior and quality of life. Enrollment completed just 4 months after the original projected date. Multiple important study milestones were reached during the past year including finishing the primary objective on time, breaking the study medication blind, and analyzing double blind data.

The study found differences between the three commonly used medications based on seizure control and effects on attention. Publication of these clinical trial results is expected soon. Detailed neuropsychological testing performed prior to starting medication was used to construct novel models on how attention, memory, and executive function affect academic achievement. Blood levels of study medications obtained throughout the study have led to development of new population pharmacokinetic models. Over 100 new polymorphisms were discovered in genes coding for the neuronal T-type calcium channels; the relationship of these polymorphisms to drug response is being examined. The trial cohort is being followed to assess whether the best short term medication is also the best long term medication. The findings of this landmark study have already begun to alter clinical care around the world for this common pediatric epilepsy syndrome.

### Childhood Epilepsy: Factors affecting Adaptation

Children with epilepsy have high rates of comorbidities such as mental health problems and academic underachievement. Most research has focused on children who had seizures for many years, which has made it difficult to know what factors contribute to the mental health and academic problems. Drs DeGrauw and Byars joined with researchers at Indiana University to study 350 children with first recognized seizure (FRS). They followed them prospectively for 36 months to identify factors that predict behavioral adjustment and academic achievement. We published a series of articles on this population over the past 3 years with the following conclusions: MRI abnormalities were found in 14.4% of children with a FRS who are otherwise developing normally. A second unprovoked seizure occurred in 76% of children with a FRS. 13% of children with a FRS had persistent seizures during the first 36 months. Children with a FRS who have an IQ of  $\geq 70$  have lower neuropsychological functioning in language, processing speed, attention/executive/construction, and verbal memory and learning than their healthy siblings at baseline, 18 months, and 36 months. Children with persistent seizures during the first 36 months after seizure onset have the greatest decline in neuropsychological functioning. Children with seizures had significantly more sleep problems than normal and these were related to cognitive problems. Bedtime difficulties, daytime somnolence, and parasomnias were the most frequently occurring sleep problems. Approximately one fourth of children with a FRS are in the at-risk range for depression symptoms at baseline. Children with a FRS have more total behavior problems than their siblings at baseline, 18 months, and 36 months. The individual areas of greatest difficulty are attention problems and somatic complaints. It is our hope that this study will result in better management of these co-morbidities in children with

epilepsy.

## Headache Center

The Center continues to advance characterization, pathophysiology, management and outcome of pediatric and adolescent patients with headache.

The characterization has been expanded into an investigation of features and etiologies in the differences between boys and girls with migraine and now includes the description of the development of menstrual migraine in adolescents. The use of genomic expression analysis contributes to our understanding of the pathophysiological changes that underlie the development of migraine and expression of acute migraine attacks. We have identified preliminary biomarkers for patients at risk of development of medication overuse headaches and we are moving forward with the identification of other sub-groups. One of these groups is patients with cutaneous allodynia with central sensitization. This characteristic has been noted to contribute to the progression of headaches in adults. To date we have only been able to characterize this through patients clinical recognition of these symptoms. To better understand this we have begun testing using quantitative sensory testing to better understand the level of allodynia in patients both during the acute headache attack and inter-ictally. The neurophysiological basis of acute migraine attack is being investigated using MEG. We have tested adolescents having an acute migraine for both motor cognitive ability and mis-matched negativity. Both of these test have demonstrated altered cortical functioning during an acute attack providing a foundation for further understanding the neurophysiological basis of migraine.

These acute studies can be performed due to the development and continuation of the acute headache care unit. This unit has greatly enhanced our ability to manage children and adolescents with acute headache exacerbations. These tools are also being advanced through our NIH sponsored study evaluating the benefit of coping skills training in children with chronic migraine.

## Division Publications

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1. Gilbert DL. "**Paroxysmal movement disorders.**" *Current management in child neurology*. Shelton, CT: People's Medical Publishing House; 2009: 522-524.
2. Kotecha R, Pardos M, Wang Y, Wu T, Horn P, Brown D, Rose D, deGrauw T, Xiang J. [Modeling the developmental patterns of auditory evoked magnetic fields in children](#). *PLoS One*. 2009; 4: e4811.
3. Newmeyer AJ, Aylward C, Akers R, Ishikawa K, Grether S, deGrauw T, Grasha C, White J. [Results of the Sensory Profile in children with suspected childhood apraxia of speech](#). *Phys Occup Ther Pediatr*. 2009; 29: 205-20.
4. Vorhees CV, Schaefer TL, Skelton MR, Grace CE, Herring NR, Williams MT. [\(+/-\)3,4-Methylenedioxymethamphetamine \(MDMA\) dose-dependently impairs spatial learning in the morris water maze after exposure of rats to different five-day intervals from birth to postnatal day twenty](#). *Dev Neurosci*. 2009; 31: 107-20.
5. Murray DS, Ruble LA, Willis H, Molloy CA. [Parent and teacher report of social skills in children with autism spectrum disorders](#). *Lang Speech Hear Serv Sch*. 2009; 40: 109-15.
6. Schmithorst VJ, Altes TA, Young LR, Franz DN, Bissler JJ, McCormack FX, Dardzinski BJ, Brody AS. [Automated algorithm for quantifying the extent of cystic change on volumetric chest CT: initial results in Lymphangiomyomatosis](#). *AJR Am J Roentgenol*. 2009; 192: 1037-44.
7. Slaughter L, Vartzelis G, Arthur T. [New GLUT-1 mutation in a child with treatment-resistant epilepsy](#). *Epilepsy Res*. 2009; 84: 254-6.
8. Vannest JJ, Karunanayaka PR, Altaye M, Schmithorst VJ, Plante EM, Eaton KJ, Rasmussen JM, Holland SK. [Comparison of fMRI data from passive listening and active-response story processing tasks in children](#). *J Magn Reson Imaging*. 2009; 29: 971-6.
9. Wong B, Gilbert DL, Walker WL, Liao IH, Lit L, Stamova B, Jickling G, Apperson M, Sharp FR. [Gene expression in blood of subjects with Duchenne muscular dystrophy](#). *Neurogenetics*. 2009; 10: 117-25.
10. Yoon U, Fonov VS, Perusse D, Evans AC. [The effect of template choice on morphometric analysis of pediatric brain data](#). *Neuroimage*. 2009; 45: 769-77.
11. DeRoos ST, Chillag KL, Keeler M, Gilbert DL. [Effects of sleep deprivation on the pediatric electroencephalogram](#). *Pediatrics*. 2009; 123: 703-8.
12. Hershey AD, Powers SW, Nelson TD, Kabbouche MA, Winner P, Yonker M, Linder SL, Bicknese A, Sowel MK, McClintock W. [Obesity in the pediatric headache population: a multicenter study](#). *Headache*. 2009; 49: 170-7.
13. Linam WM, Wesselkamper K, Gerber MA. [Peripheral neuropathy in an adolescent treated with linezolid](#). *Pediatr*

*Infect Dis J.* 2009; 28: 149-51.

14. Gilbert DL, Leslie EJ, Keddache M, Leslie ND. [A novel hereditary spastic paraplegia with dystonia linked to chromosome 2q24-2q31](#). *Mov Disord.* 2009; 24: 364-70.
15. Franz DN, de Vries PJ, Crino PB. [Giant cell astrocytomas in tuberous sclerosis complex](#). *Arch Dis Child.* 2009; 94: 75-6.
16. Kabbouche MA, Powers SW, Segers A, LeCates S, Manning P, Biederman S, Vaughan P, Burdine D, Hershey AD. [Inpatient treatment of status migraine with dihydroergotamine in children and adolescents](#). *Headache.* 2009; 49: 106-9.
17. Lit L, Enstrom A, Sharp FR, Gilbert DL. [Age-related gene expression in Tourette syndrome](#). *J Psychiatr Res.* 2009; 43: 319-30.
18. Loepke AW, Istaphanous GK, McAuliffe JJ, 3rd, Miles L, Hughes EA, McCann JC, Harlow KE, Kurth CD, Williams MT, Vorhees CV, Danzer SC. [The effects of neonatal isoflurane exposure in mice on brain cell viability, adult behavior, learning, and memory](#). *Anesth Analg.* 2009; 108: 90-104.
19. Vorhees CV, Johnson HL, Burns LN, Williams MT. [Developmental treatment with the dopamine D2/3 agonist quinpirole selectively impairs spatial learning in the Morris water maze](#). *Neurotoxicol Teratol.* 2009; 31: 1-10.
20. Korostenskaja M, Dapsys K, Siurkute A, Dudlauskaitė A, Pragaraviciene A, Maciulis V, Kahkanen S. [The effect of quetiapine on auditory P300 response in patients with schizoaffective disorder: preliminary study](#). *Ann Clin Psychiatry.* 2009; 21: 49-50.
21. Skelton MR, Schaefer TL, Herring NR, Grace CE, Vorhees CV, Williams MT. [Comparison of the developmental effects of 5-methoxy-N,N-diisopropyltryptamine \(Foxy\) to \(+/-\)-3,4-methylenedioxymethamphetamine \(ecstasy\) in rats](#). *Psychopharmacology (Berl).* 2009; 204: 287-97.
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23. Xiang J, Liu Y, Wang Y, Kotecha R, Kirtman EG, Chen Y, Huo X, Fujiwara H, Hemasilpin N, DeGrauw T, Rose D. [Neuromagnetic correlates of developmental changes in endogenous high-frequency brain oscillations in children: a wavelet-based beamformer study](#). *Brain Res.* 2009; 1274: 28-39.
24. Ricciardi E, Pietrini P, Schapiro MB, Rapoport SI, Furey ML. [Cholinergic modulation of visual working memory during aging: a parametric PET study](#). *Brain Res Bull.* 2009; 79: 322-32.
25. Crawford MJ, Lehman L, Slater S, Kabbouche MA, LeCates SL, Segers A, Manning P, Powers SW, Hershey AD. [Menstrual migraine in adolescents](#). *Headache.* 2009; 49: 341-7.
26. Hershey AD. [Menstrual migraine: how early can it start?](#). *Headache.* 2009; 49: 348-9.
27. Kelley MS, Jacobs MP, Lowenstein DH. [The NINDS epilepsy research benchmarks](#). *Epilepsia.* 2009; 50: 579-82.
28. Khatri R, Hershey AD, Wong B. [Prochlorperazine--treatment for acute confusional migraine](#). *Headache.* 2009; 49: 477-80.
29. Mannaa MM, Kalra M, Wong B, Cohen AP, Amin RS. [Survival probabilities of patients with childhood spinal muscle atrophy](#). *J Clin Neuromuscul Dis.* 2009; 10: 85-9.
30. Hershey AD. [Teens, migraine, suicide, and suicidal thoughts](#). *Neurology.* 2009; 72: e61-2.
31. Kotecha R, Xiang J, Wang Y, Huo X, Hemasilpin N, Fujiwara H, Rose D, deGrauw T. [Time, frequency and volumetric differences of high-frequency neuromagnetic oscillation between left and right somatosensory cortices](#). *Int J Psychophysiol.* 2009; 72: 102-10.
32. Vannest J, Karunanayaka PR, Schmithorst VJ, Szaflarski JP, Holland SK. [Language networks in children: evidence from functional MRI studies](#). *AJR Am J Roentgenol.* 2009; 192: 1190-6.
33. Vorhees CV, Skelton MR, Grace CE, Schaefer TL, Graham DL, Braun AA, Williams MT. [Effects of \(+\)-methamphetamine on path integration and spatial learning, but not locomotor activity or acoustic startle, align with the stress hyporesponsive period in rats](#). *Int J Dev Neurosci.* 2009; 27: 289-98.
34. Yuan W, Altaye M, Ret J, Schmithorst V, Byars AW, Plante E, Holland SK. [Quantification of head motion in children during various fMRI language tasks](#). *Hum Brain Mapp.* 2009; 30: 1481-9.
35. Gilbert DL. **"Design and analysis of motor-evoked potential data in pediatric neurobehavioral disorder investigations."** *The Oxford Handbook of Transcranial Stimulation.* Oxford, UK: Oxford University Press; 2008: 389-400.
36. Krueger DA, Franz DN. [Current management of tuberous sclerosis complex](#). *Paediatr Drugs.* 2008; 10: 299-313.
37. Sun Y, Jia L, Williams MT, Zamzow M, Ran H, Quinn B, Aronow BJ, Vorhees CV, Witte DP, Grabowski GA. [Temporal gene expression profiling reveals CEBPD as a candidate regulator of brain disease in prosaposin deficient mice](#). *BMC Neurosci.* 2008; 9: 76.

38. Walker WL, Liao IH, Gilbert DL, Wong B, Pollard KS, McCulloch CE, Lit L, Sharp FR. [Empirical Bayes accomodation of batch-effects in microarray data using identical replicate reference samples: application to RNA expression profiling of blood from Duchenne muscular dystrophy patients](#). *BMC Genomics*. 2008; 9: 494.
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40. Glauser TA, Sankar R. [Core elements of epilepsy diagnosis and management: expert consensus from the Leadership in Epilepsy, Advocacy, and Development \(LEAD\) faculty](#). *Curr Med Res Opin*. 2008; 24: 3463-77.
41. Kalnin AJ, Fastenau PS, deGrauw TJ, Musick BS, Perkins SM, Johnson CS, Mathews VP, Egelhoff JC, Dunn DW, Austin JK. [Magnetic resonance imaging findings in children with a first recognized seizure](#). *Pediatr Neurol*. 2008; 39: 404-14.
42. Miles MV, Tang PH, Miles L, Steele PE, Moyer MJ, Horn PS. [Validation and application of an HPLC-EC method for analysis of coenzyme Q10 in blood platelets](#). *Biomed Chromatogr*. 2008; 22: 1403-8.
43. Skelton MR, Able JA, Grace CE, Herring NR, Schaefer TL, Gudelsky GA, Vorhees CV, Williams MT. [\(+/-\)-3,4-Methylenedioxyamphetamine treatment in adult rats impairs path integration learning: a comparison of single vs once per week treatment for 5 weeks](#). *Neuropharmacology*. 2008; 55: 1121-30.
44. Wang Y, Xiang J, Kotecha R, Vannest J, Liu Y, Rose D, Schapiro M, DeGrauw T. [Spatial and frequency differences of neuromagnetic activities between the perception of open- and closed-class words](#). *Brain Topogr*. 2008; 21: 75-85.
45. Xiang J, Xiao Z. [Spatiotemporal and frequency signatures of noun and verb processing: A wavelet-based beamformer study](#). *J Clin Exp Neuropsychol*. 2008; : 1-10.
46. Furey ML, Ricciardi E, Schapiro MB, Rapoport SI, Pietrini P. [Cholinergic enhancement eliminates modulation of neural activity by task difficulty in the prefrontal cortex during working memory](#). *J Cogn Neurosci*. 2008; 20: 1342-53.
47. Hershey AD, Burdine D, Liu C, Nick TG, Gilbert DL, Glauser TA. [Assessing quality and normalization of microarrays: case studies using neurological genomic data](#). *Acta Neurol Scand*. 2008; 118: 29-41.
48. Patsalos PN, Berry DJ, Bourgeois BF, Cloyd JC, Glauser TA, Johannessen SI, Leppik IE, Tomson T, Perucca E. [Antiepileptic drugs--best practice guidelines for therapeutic drug monitoring: a position paper by the subcommission on therapeutic drug monitoring. ILAE Commission on Therapeutic Strategies](#). *Epilepsia*. 2008; 49: 1239-76.
49. Vannatta K, Getzoff EA, Gilman DK, Noll RB, Gerhardt CA, Powers SW, Hershey AD. [Friendships and social interactions of school-aged children with migraine](#). *Cephalalgia*. 2008; 28: 734-43.
50. Vannatta K, Getzoff EA, Powers SW, Noll RB, Gerhardt CA, Hershey AD. [Multiple perspectives on the psychological functioning of children with and without migraine](#). *Headache*. 2008; 48: 994-1004.
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53. Byars AW, Byars KC, Johnson CS, DeGrauw TJ, Fastenau PS, Perkins S, Austin JK, Dunn DW. [The relationship between sleep problems and neuropsychological functioning in children with first recognized seizures](#). *Epilepsy Behav*. 2008; 13: 607-13.
54. Standridge SM, O'Brien SH. [Idiopathic intracranial hypertension in a pediatric population: a retrospective analysis of the initial imaging evaluation](#). *J Child Neurol*. 2008; 23: 1308-11.
55. Gilbert DL. [Drug-induced movement disorders in children](#). *Ann N Y Acad Sci*. 2008; 1142: 72-84.
56. Hershey AD. [Genetics of headache in children: where are we headed?](#). *Curr Pain Headache Rep*. 2008; 12: 367-72.
57. Ishii R, Canuet L, Ochi A, Xiang J, Imai K, Chan D, Iwase M, Takeda M, Snead OC, 3rd, Otsubo H. [Spatially filtered magnetoencephalography compared with electrocorticography to identify intrinsically epileptogenic focal cortical dysplasia](#). *Epilepsy Res*. 2008; 81: 228-32.
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- [acid and PET](#) . *J Nucl Med*. 2008; 49: 1414-21.
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61. Heil JW, Malinowski L, Rinderknecht A, Broderick JP, Franz D. [Use of intravenous tissue plasminogen activator in a 16-year-old patient with basilar occlusion](#) . *J Child Neurol*. 2008; 23: 1049-53.
62. Herring NR, Schaefer TL, Gudelsky GA, Vorhees CV, Williams MT. [Effect of +-methamphetamine on path integration learning, novel object recognition, and neurotoxicity in rats](#) . *Psychopharmacology (Berl)*. 2008; 199: 637-50.
63. Tillema JM, Byars AW, Jacola LM, Schapiro MB, Schmithorst VJ, Szaflarski JP, Holland SK. [Reprint of "Cortical reorganization of language functioning following perinatal left MCA stroke" \[Brain and Language 105 \(2008\) 99-111\]](#) . *Brain Lang*. 2008; 106: 184-94.
64. Miles L, Degrauw TJ, Dinopoulos A, Cecil KM, van der Knaap MS, Bove KE. [Megalencephalic Leukoencephalopathy with Subcortical Cysts \(MLC\): a third confirmed case with literature review](#) . *Pediatr Dev Pathol*. 2008; : 1.

## Grants, Contracts, and Industry Agreements

### Grant and Contract Awards

### Annual Direct / Project Period Direct

#### DEGRAUW, A

##### Point Care Center for Emerging Neurotechnologies

National Institutes of Health (University of Cincinnati)

U54 EB 007954

09/30/07 - 06/30/12

\$7,157 / \$37,271

#### GILBERT, D

##### Anomalous Motor Physiology In ADHD

National Institutes of Health (Kennedy Krieger Research Institute)

R01 MH 078160

07/01/06 - 06/30/11

\$66,091 / \$318,246

##### 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

\$24,428 / \$134,949

#### GLAUSER, T

##### Epilepsy Phenome/Genome Project

National Institutes of Health (University of California-San Francisco)

U01 NS 053998

05/01/07 - 04/30/12

\$124,813 / \$199,303

#### 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

\$218,750 / \$1,093,750

#### MOLLOY, C

##### Genome Wide Association Study of Autism

Autism Speaks

07/01/07 - 06/30/10

\$136,309 / \$408,856

#### VANNEST, J

##### The Neural Basis of Language in Neurodevelopmental Disorders

Jerome LeJeune Foundation

07/01/07 - 06/28/09

\$9,295 / \$18,916

#### VORHEES, C

##### Developmental Effects of Methamphetamine-Like Stimulant

National Institutes of Health

R01 DA 006733

04/01/05 - 03/31/10

\$185,843 / \$1,000,000

##### Effects of Neonatal MDMA on Brain and Behavior

National Institutes of Health

R01 DA 021394

04/01/06 - 03/31/11

\$190,316 / \$1,000,000

**Training Program in Teratology**

National Institutes of Health

T32 ES 007051

07/01/07 - 06/30/12

\$285,190 / \$1,432,850

**Genetic Differences in PCB-Induced Behavior**

National Institutes of Health (University of Cincinnati)

R21 ES 015335

12/15/07 - 11/30/09

\$52,120 / \$112,720

**WILLIAMS, M.****Effect of Lead, Manganese and Stress During Development**

National Institutes of Health

R01 ES 015689

09/18/06 - 06/30/11

\$244,562 / \$1,250,000

**WONG, B.****Spinal Muscular Atrophy Foundation Biomarker Pilot Study**

Spinal Muscular Atrophy Foundation

10/01/08 - 09/30/09

\$34,231 / \$34,231

**Current Year Direct****\$1,579,195****Industry Contracts****Franz, D**

Novartis Pharmaceuticals

\$ 196,523

**Hershey, G**

Endo Pharmaceuticals, Inc.

\$ 22,145

GlaxoSmithKline

\$ 30,388

**Vorhees, C**

Eli Lilly and Company

\$ 120,556

**Wong, B**

PTC Therapeutics, Inc.

\$ 145,857

**Current Year Direct Receipts****\$515,469****Total \$2,094,664**