**Significant Accomplishments**

**Tuberous Sclerosis**
The division continues to grow, both in clinical care and research. In 2013, the clinicians in the Tuberous Sclerosis Clinic (TSC) evaluated more than 650 unique patients and welcomed five new specialists: Janet Boyle, MD, (Adult Nephrology), Stuart Goldstein, MD, (Pediatric Nephrology); Jens Goebel, MD, (Pediatric Neurology); Elizabeth Gosnell, DMD, MS, (Pediatric Dentistry); and Jamie Capal, MD, (Pediatric Neurology and Neurodevelopmental Disabilities). The TSC continues to be the largest, most comprehensive clinic of its kind in the world. In research, Brian Siroky, PhD, joined the clinic team with joint faculty appointment in Nephrology and Neurology. Results from the 2012 International TSC Consensus Conference, chaired by Darcy Krueger, MD, PhD, included one of 14 manuscripts published by the research team in 2013. Three new funded projects were added in 2013.

**Movement Disorder and Tourette Syndrome**
The Movement Disorder and Tourette Syndrome Clinic sees children with tics, stereotypies, dystonia, tremor, chorea, ataxia, functional movement disorders, and drug-induced movement disorders at the base and several satellite locations. Our program has a national reputation and regularly gets referrals from other states for second opinions. The Dystonia and Complex Movement Disorder clinic provides pharmacological treatment, botulinum toxin, and Deep Brain Stimulation. Pre- and post-operative management is multidisciplinary.
Program highlights include publication of the first study of a novel agent for tic suppression in Tourette Syndrome; lead site for phase 2 study in children and adolescents; NIH funding for studies in Tourette genetics, and ADHD brain physiology.

**Neonatal Neurology**

The Neonatal Neurology team provides consultation services for the acute management of seizures and other neurological disorders in newborns at Cincinnati Children’s Hospital, Good Samaritan Hospital and University Hospital of Cincinnati. We provide fetal consultations for brain disorders as part of a multidisciplinary team at the Cincinnati Children's Hospital Fetal Care Center. We continued to expand a combined neurology/neonatology follow-up clinic that treats children for their first several years of life. This outpatient care involves longitudinal identification of risk factors for poor neurologic development. The team is expanding services via Telemedicine to Kettering, Ohio, and plans to add a faculty member to accommodate the growth.

**Comprehensive Epilepsy Program**

For the third consecutive year, clinical volume increased by 20 percent at the epilepsy surgery program. Ten peer-reviewed publications on epilepsy surgery were published from several different first authors in the multidisciplinary group. Work continues on two institutional grants. The epilepsy Advanced Therapies clinic saw a greater than 50 percent increase in clinical volume for the third consecutive year.

**Division Publications**


hemorrhage treatment of tics in Tourette syndrome

Geracioti TD, Jr.

splice site mutations in the dystrophin gene transcript

G Finkel RS

Disorders, and Therapeutics

Using Awake Animals

gene Isl1 is required for the correct development of the striatonigral pathway in the mouse

Ehrman LA

Cudzilo CJ

social functioning in children and adolescents with epilepsy

Byars AW

Plassmann G

Kyriazis J

Mdimegh S

Kruger T

Hughes DA

GJ

Knoers NV

Lu KC

Su SL

Gigante M

Santangelo L

Diella S

Argentiero L

Cianciotta F

Martino M

Ranieri E

Grandaliano G

Giordano M

Gesualdo L

Fernandes J

Ribeiro S

Garrido P

Sereno J

Costa E

Reis F

Santos-Silva A

Chub O

Aires I

Polidori D

Santos AR

Brito Costa A

Simoes C

Reuff J

Nolasco F

Calado J

Van Der Tol L

Biegstraaten M

Florquin S

Vogt L

Van Den Bergh Weerman MA

Hollak CE

Hughes DA

Lachmann RH

Oliveira JP

Ortiz A

Svarstad E

Terry W

Tondel C

Waldek S

Wanner C

West ML

Linthorst GE

Kaesler N

Brandenburg V

Theuwissen E

Vermeer C

Floegje J

Schlieper AB

Kruger T

Ydxakis D

Goulielemos G

Antonaki E

Stylianou K

Sfakianaki M

Papadogiannakis A

Dafnis E

Mdimegh S

Ben Hadj Mbarek-Fredj I

Moussa A

Omezzine A

Zellama D

Mabrouk S

Zouari N

Hassayoun S

Chemli J

Achour A

Bouslama A

Abroug S

Spoto B

Leonardis D

Poli C

Pisano A

Cutrupi S

Testa A

Parlongo RM

D’Arrigo G

Tripepi G

Mallamaci F

Zoccali C

Group OBOTMW

Mdimegh S

Ben Hadj Mbarek-Fredj I

Moussa A

Omezzine A

Mabrouk S

Zouari N

Hassayoun S

Chemli J

Zellama D

Achour A

Bouslama A

Abroug S

Hohenstein-Scheibenecker K

Schmidt A

Stylianou KG

Kyriadis J

Androvitsanea A

Tzanakakis M

Maragkaki E

Petrakis J

Stratakis S

Poulidari R

Vardaki E

Peta C

Statigis S

Perakis K

Daphnis E

Cybulla M

West M

Nicholls K

Torras J

Neumann P

Sunder-Plassmann G

Feriozzi S

Fabry Outcome Survey Renal Working G

Metzinger-Le Meuth V

Taibi F

M'Baya-Moutoula E

Louvet L

Massy Z

Metzinger L

Mani LY

Sidler D

Vogt B

Nikolskaya N

Cox JA

Kingswood JC

Smimov A

Zaruvski M

Kayukov I

Karunnaya H

Sipovski V

Kukaleva L

Dobronrovav V


33. Kim HK, Shiraj S, Anton CG, Hom PS, Dardzinski BJ. Age and sex dependency of cartilage T2


64. Tian C, Gilbert DL. Association between performance on neurology in-training and certification


Faculty, Staff, and Trainees

Faculty Members

Andrew Hershey, MD, PhD, Professor
Leadership Division Director; Director Headache Center; Endowed Chair of Neurology

Research Interests Migraine, blood genomics

Todd Arthur, MD, Assistant Professor
Research Interests Brain concussion

Ravindra Arya, MD, DM, Assistant Professor
Research Interests Language mapping, electrocorticography, epilepsy surgery, clinical epidemiology

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
Leadership Director Tuberous Sclerosis program
Research Interests Tuberous sclerosis

Donald Gilbert, MD, Professor
Leadership Director Movement Disorders program; Director Neurology Residency Program
Research Interests Tourette syndrome, Transcranial Magnetic Stimulation (TMS)

Tracy A Glauser, MD, Professor
Leadership Director Comprehensive Epilepsy program
Research Interests Epilepsy, pharmacology

Hansel Greiner, MD, Assistant Professor
Research Interests Epilepsy

Christina Gross, PhD, Assistant Professor
Research Interests Molecular mechanisms of Fragile X syndrome, epilepsy and autism spectrum disorders

Barbara Hallinan, MD, PhD, Assistant Professor
Research Interests CSF steroid profiles

Katherine Holland-Bouley, MD, PhD, Associate Professor
Research Interests Ion channels and epilepsy

Paul Horn, PhD, Professor
Research Interests Data analysis, reference ranges

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

Marielle A Kabbouche, MD, Associate Professor
Research Interests Migraine

Joanne Kacperski, MD, Assistant Professor
Research Interests Pediatric headaches, chronic post-traumatic headaches

Darren Kadis, PhD, Assistant Professor
Research Interests Neuroimaging and MEG of language

Darcy Krueger, MD, PhD, Associate Professor
Diego Morita, MD, Assistant Professor
Research Interests: Tuberous Sclerosis

Hope O'Brien, MD, Assistant Professor
Research Interests: Epilepsy, pharmacology

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

Mark Schapiro, MD, Professor
Research Interests: Neurodevelopmental disorders

Matthew Skelton, PhD, Assistant Professor
Research Interests: Neurobehavioral and neurometabolic

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

Mary Sutton, MD, Associate Professor
Research Interests: Neuro-oncology

Jonathan Taylor, MD, Assistant Professor
Research Interests: Arteriopathy and outcomes in pediatric stroke

Jeffrey Tenney, MD, PhD, Assistant Professor
Research Interests: Neurophysiology and genesis of absence epilepsy

Cameron Thomas, MD, Assistant Professor
Research Interests: Neonatal neurology

Lubov Timchenko, PhD, Professor
Research Interests: Translate knowledge of the molecular pathobiology into development of the therapeutic treatments for diseases caused by non-coding RNA repeats

Jennifer Vannest, PhD, Associate Professor
Research Interests: Speech and language development

Charles Vorhees, PhD, Professor
Leadership: 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

Jonathan Wilson, PhD, Assistant Professor
Research Interests: Neurophysiology and engineering

Brenda Wong, MD, Professor
Leadership: 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
  **Leadership** Director MEG Research program
  **Research Interests** MEG

### Joint Appointment Faculty Members

Michael Miles, PhD, Professor (Pathology)

### Clinical Staff Members

- Irina Rybalsky, MD, *Duchenne's Muscular Dystrophy;*
- Jamie Capal, MD, *Neurodevelopment and neurobehavior*

### Trainees

- Haneul Lee, MD, PGYVI, Yonsei University
- Sarah Weatherspoon, MD, PGYVI, University of Texas Southwestern
- Katrina Peariso, MD, PGYVI, University of New Mexico
- Thomas Dye, MD, PGYVI, St. Louis University
- Gewalin Aungaroon, MD, PGYV, Faculty of Medicine Ramathibodi
- Dror Kraus, MD, PhD, PGYV, Hebrew University
- Michael Oldham, MD, MPH, PGYV, George Washington University
- Cuixia Tian, MD, PGYV, Medical Center of Fudan University
- Vinita Knight, MD, MPH, PGYIV, Eastern Virginia Medical School
- Kelly Kremer, MD, PGYIV, University of Cincinnati
- Michael Sweeney, MD, PGYIV, Medical College of Wisconsin
- Marissa Vawter, MD, PGYIV, Indiana University
- Andrew Knox, MD, MS, PGYIII, Rush University College of Medicine
- Staci King, MD, PGYIII, University of Illinois - Chicago
- Robert Blake, MD, PGYIII, Baylor College of Medicine
- Jennifer O'Malley, MD, PhD, PGYIII, University of Cincinnati

### Division Collaboration

**Adolescent/Young Adult Epilepsy Pregnancy Clinic**
(Dr. Shannon Standridge)
  - **Behavioral Medicine & Clinical Psychology** » Dr. K. Junger

**Comprehensive Epilepsy Program**
(Dr. Anna Byars, Dr. Tracy Giauser, Dr. Hans Greiner, Dr. Barb Hallinan, Dr. Katie Holland, Dr. Diego Morita, Dr. Jeff Tenney)
  - **Anesthesiology** » Dr. V. Busso, Dr. J. McAuliffe, and Dr. S. Danzer
  - **Behavioral Medicine and Clinical Psychology** » Dr. A. Modi and Dr. J. Epstein
  - **Biomedical Informatics** » Dr. J. Pestian
Biostatistics & Epidemiology » Dr. M. Altaye
Radiology » Dr. S. Holland, Dr. M. Gelfand, and Dr. J. Leach
Neurosurgery » Dr. F. Mangano
Human Genetics » Dr. E. Schorry
Clinical Pharmacology » Dr. S. Vinks
Pathology & Laboratory Medicine » Dr. L. Miles
Developmental & Behavioral Pediatrics » Dr. D. Murray

Comprehensive Neuromuscular Center
(Dr. James Collins, Dr. Irina Rybalsky, Dr. Brenda Wong)
  Cardiology » Dr. J. Towbin, Dr. I Wilmot, Dr. J. Jefferies, Dr. C. Castleberry, Dr. A. Lorts, and Dr. C. Villa
  Gastroenterology, Hepatology & Nutrition » Dr. A. Kaul
  Otolaryngology » Dr. M. Rutter
  Endocrinology » Dr. S. Rose
  Orthopaedics » Dr. J. McCarthy, Dr. P. Sturm, and Dr. V. Jain
  Physical Medicine & Rehabilitation » Dr. M. McMahon
  Pulmonary Medicine » Dr. R. Amin and Dr. H. Sawnani
  Pathology & Laboratory Medicine » Dr. L. Miles and Dr. K. Bove
  Pediatric General & Thoracic Surgery » Dr. R. Brown and Dr. T. Inge
  Anesthesiology » Dr. N. Weidner and Dr. K. Goldschneider
  Molecular Cardiovascular Biology » Dr. J. Molkentin
  Nephrology and Hypertension » Dr. E. Jackson

Concussion Clinic
(Dr. Todd Arthur)
  Physical Medicine & Rehabilitation » Dr. B. Kurowski
  Sports Medicine » Dr. P. Gubanich, Dr. K. Berz, and Dr. K. Logan

Headache Center
(Dr. Andrew Hershey, Dr. Marielle Kabbouche, Dr. Joanne Kacperski, Dr. Hope O’Brien)
  Behavioral Medicine & Clinical Psychology » Dr. S. Powers
  Radiology - Neuroimaging Research Consortium » Dr. S. Holland
  Rheumatology » Dr. M. Barnes
  Cardiology » Dr. T. Knilans

Magnetoencephalography (MEG) Research
(Dr. Douglas Rose, Dr. Jing Xiang, Dr. J. Adam Wilson)
  Psychiatry » Dr. C. Erickson and Dr. E. Harris
  Behavioral Medicine & Clinical Psychology » Dr. D. Beebe
  Anesthesiology » Dr. J. McAuliffe
  Physical Medicine & Rehabilitation » Dr. J. Vargus-Adams

Movement Disorders Clinic & Tourette Disorder Clinic
(Dr. Don Gilbert, Dr. Steve Wu)
  Psychiatry » Dr. E. Pedapati, Dr. E. Harris, and Dr. C. Erickson
Behavioral Medicine & Clinical Psychology » Dr. W. Lopez, Dr. N. Zahka, and Dr. B. LeJeune

Human Genetics » Dr. D. Neilsen, Dr. R. Stottmann, Dr. T. Huang, and Dr. T. Burrow

Neurosurgery » Dr. E. Air

Radiology » Dr. K. Cecil

Neonatal Clinic
(Dr. Mark Schapiro, Dr. J. Michael Taylor, Dr. Cameron Thomas)

Radiology - Neurimaging Research Consortium » Dr. S. Holland and Dr. W. Yuan

Section of Neonatology, Perinatal and Pulmonary Biology » Dr. P. Kingma, Dr. S. Merhar, Dr. T. Cahill, and Dr. B. Haberman

Neurosurgery » Dr. K. Bierbrauer

Pediatric & Adolescent Gynecology » Dr. W. Polzin

Cardiology » Dr. P. Goldenberg and Dr. J. Anderson

Neurobehavioral Animal Core (Vorhees/Williams lab)
(Dr. Matt Skelton, Dr. Chip Vorhees, Dr. Michael Williams)

Human Genetics » Dr. Y. Sun and Dr. R. Stottmann

Developmental Biology » Dr. K. Campbell and Dr. Y. Yoshida

Critical Care Medicine » Dr. H. Wong

Experimental Hematology & Cancer Biology » Dr. D. Pan, Dr. N. Ratner, and Dr. R. Waclaw

Psychiatry » Dr. C. Erickson

Anesthesiology » Dr. A. Loepke and Dr. S. Danzer

Neurosurgery » Dr. F. Mangano

Radiology » Dr. D. Linquist and Dr. W. Yuan

Pediatric Neuroimaging Research Consortium
(Dr. Jennifer Vannest, Dr. Darren Kadis)

Radiology » Dr. S. Holland, Dr. J. Leach, Dr. G. Lee, Dr. W. Yuan, and Dr. M. DiFrancesco

Biostatistics & Epidemiology » Dr. M. Altaye

Communication Science » Dr. T. Horowitz-Kraus, Dr. D. Moore, and Dr. L. Hunter

Anesthesiology » Dr. D. Kurth, Dr. J. Praytap, and Dr. V. Olbrecht

Biomedical Informatics » Dr. M. Wagner

Endocrinology » Dr. L. Dolan and Dr. A. Shah

Rett Syndrome/Related Spectrum Disorders Clinic
(Dr. Shannon Standridge)

Pulmonary Medicine » Dr. Amin

Adolescent & Transition Medicine » Dr. A. Nye

Orthopaedics » Dr. J. McCarthy

Gastroenterology, Hepatology & Nutrition » Dr. A. Kaul

Pediatric & Adolescent Gynecology » Dr. L. Breech

Sleep Clinic
(Dr. Sejal Jain)

Pulmonary Medicine » Dr. N. Simakajomboon, Dr. M. Ednick, Dr. G. McPhail, Dr. H. Sawnani, and Dr. J.
Crisalli

Psychiatry » Dr. L. Wink

Statistical Data Analysis & Reference Ranges
(Dr. Paul Horn)

Radiology » Dr. A. Merrow, Dr. T. Laor, and Dr. S. Serai
Psychiatry » Dr. C. Erickson and Dr. L. Wink
Radiology » Dr. C. Anton, Dr. K. Eaton, Dr. J. Leach, and Dr. H. Kim
Neurosurgery » Dr. F. Mangano and Dr. C. Stevenson
Pathology & Laboratory Medicine » Dr. L. Miles and Dr. P. Steele

Tuberous Sclerosis
(Dr. David Franz, Dr. Darcy Krueger)

Otolaryngology » Dr. L. Young
Anesthesiology » Dr. C. Gordon
Radiology » Dr. M. Care, Dr. J. Leach, Dr. W. Yuan, and Dr. S. Serai
Neurosurgery » Dr. K. Crone
Cardiology » Dr. T. Knilans
Human Genetics » Dr. E. Schorry
Psychiatry » Dr. D. Nelson
Developmental & Behavioral Pediatrics » Dr. D. Murray and Dr. N. Bing

Grants, Contracts, and Industry Agreements

<table>
<thead>
<tr>
<th>Grant and Contract Awards</th>
<th>Annual Direct</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GILBERT, D</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2/2-Anomalous Motor Physiology in ADHD</strong>&lt;br&gt;National Institutes of Health&lt;br&gt;R01 MH 095014&lt;br&gt;05/15/12-04/30/17</td>
<td>$175,000</td>
</tr>
<tr>
<td><strong>4/8-Collaborative Genomic Studies of Tourette Disorder</strong>&lt;br&gt;National Institutes of Health&lt;br&gt;R01 MH 092520&lt;br&gt;09/15/11-06/30/15</td>
<td>$50,000</td>
</tr>
<tr>
<td><strong>GLAUSER, T</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Cincinnati Neuroscience Clinical Trials Research Center</strong>&lt;br&gt;National Institutes of Health(University of Cincinnati)&lt;br&gt;U10 NS 077311&lt;br&gt;09/30/11-08/31/18</td>
<td>$100,000</td>
</tr>
<tr>
<td><strong>Epilepsy Phenome/Genome Project (EPGP)</strong>&lt;br&gt;National Institutes of Health(The University of California, San Francisco)&lt;br&gt;U01 NS 053998&lt;br&gt;05/01/08-04/30/14</td>
<td>$37,938</td>
</tr>
<tr>
<td><strong>Impact of Initial Therapy and Response on Long Term Outcome in Children with CAE</strong>&lt;br&gt;National Institutes of Health&lt;br&gt;U01 NS 045911&lt;br&gt;09/01/10-08/31/15</td>
<td>$754,283</td>
</tr>
</tbody>
</table>

Pediatric Status Epilepticus Research Group
<table>
<thead>
<tr>
<th>Organization and Project Details</th>
<th>Start Date</th>
<th>End Date</th>
<th>Funding Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epilepsy Foundation of America (Children's Hospital Boston)</td>
<td>01/01/13-12/31/14</td>
<td></td>
<td>$10,000</td>
</tr>
<tr>
<td>Pediatric Trials Network, Task Order No. HHSN27500009</td>
<td>09/01/12-09/14/14</td>
<td></td>
<td>$18,082</td>
</tr>
<tr>
<td>GROSS, C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selective Targeting of PI3K to Restore Higher Cognitive Function in FXS</td>
<td>06/24/14-04/30/16</td>
<td></td>
<td>$181,913</td>
</tr>
<tr>
<td>HERSHEY, A / POWERS, S (MPI)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amitriptyline and Topiramate in the Prevention of Childhood Migraine</td>
<td>09/30/11-08/31/16</td>
<td></td>
<td>$2,310,925</td>
</tr>
<tr>
<td>KRUEGER, D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Biomarkers of Autism Spectrum Disorders in Infants with Tuberous Sclerosis (Fixed Costs)</td>
<td>09/01/12-08/31/17</td>
<td></td>
<td>$151,870</td>
</tr>
<tr>
<td>Early Biomarkers of Autism Spectrum Disorders in Infants with Tuberous Sclerosis (Per capita)</td>
<td>09/01/12-08/31/17</td>
<td></td>
<td>$60,570</td>
</tr>
<tr>
<td>Potential EEG Biomarkers and Antiepileptogenic Strategies for Epilepsy in TSC</td>
<td>09/01/12-08/31/15</td>
<td></td>
<td>$19,814</td>
</tr>
<tr>
<td>Tuberous Sclerosis Complex Natural History Database Project</td>
<td>01/01/14-12/31/14</td>
<td></td>
<td>$17,500</td>
</tr>
<tr>
<td>ROSE, D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of Analysis Tools to Enhance Fetal Neurological Assessment</td>
<td>9/5/12-8/31/15</td>
<td></td>
<td>$11,011</td>
</tr>
<tr>
<td>SKELTON, M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generation and Validation of CrT Deficient Mice</td>
<td>05/16/13-12/12/14</td>
<td></td>
<td>$9,735</td>
</tr>
<tr>
<td>TIMCHENKO, L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Toxicity of the RNA CGG Repeats in FXTAS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Title</td>
<td>PI</td>
<td>Funding Agency</td>
<td>Grant Number</td>
</tr>
<tr>
<td>---------------</td>
<td>----</td>
<td>----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Myotonic Dystrophy Type 2</td>
<td></td>
<td>National Institutes of Health</td>
<td>R21 NS 078659</td>
</tr>
<tr>
<td>FMRI in Anterior Temporal Epilepsy Surgery</td>
<td>VANNEST, J</td>
<td>National Institutes of Health(Medical College of Wisconsin)</td>
<td>R01 NS 035929</td>
</tr>
<tr>
<td>Imaging the Effect of Centrottemporal Spikes and Seizures on Language in Children</td>
<td></td>
<td>National Institutes of Health</td>
<td>R01 NS 065840</td>
</tr>
<tr>
<td>Annual Meeting of the Neurobehavioral Teratology Society</td>
<td>VORHEES, C</td>
<td>Food and Drug Administration</td>
<td>R13 FD 004852</td>
</tr>
<tr>
<td>Latrophilin-3 and ADHD: A New Potential Mechanism</td>
<td></td>
<td>National Institutes of Health</td>
<td>R21 MH 101609</td>
</tr>
<tr>
<td>Prenatal Antidepressants and Autism Spectrum Disorder</td>
<td></td>
<td>Department of Defense</td>
<td>W81XWH-13-1-3036</td>
</tr>
<tr>
<td>Training Grant in Teratology</td>
<td></td>
<td>National Institutes of Health</td>
<td>T32 ES 07051</td>
</tr>
<tr>
<td>Transgenerational Inheritance of Epigenetic Effects of Polychlorinated Biphenyls</td>
<td></td>
<td>National Institutes of Health(University of Cincinnati)</td>
<td>R21 ES 023319</td>
</tr>
<tr>
<td>Aberrant Neuromagnetic Signatures with Chronic Migraine</td>
<td>XIANG, J</td>
<td>National Institutes of Health</td>
<td>R21 NS 081420</td>
</tr>
</tbody>
</table>

**Current Year Direct** $5,323,535

**Industry Contracts**

<table>
<thead>
<tr>
<th>PI</th>
<th>Company</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRANZ, D</td>
<td>Novartis Pharmaceuticals</td>
<td>$888,033</td>
</tr>
<tr>
<td>GILBERT, D</td>
<td>AstraZeneca Pharmaceuticals</td>
<td>$21,386</td>
</tr>
<tr>
<td>Name</td>
<td>Organization</td>
<td>Amount</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Covance, Inc.</td>
<td></td>
<td>$43,420</td>
</tr>
<tr>
<td>KABBOUCHE, M</td>
<td>Allergan, Inc.</td>
<td>$14,572</td>
</tr>
<tr>
<td>KRUEGER, D</td>
<td>Michigan Strategic Fund</td>
<td>$16,000</td>
</tr>
<tr>
<td></td>
<td>Novartis Pharmaceuticals</td>
<td>$128,734</td>
</tr>
<tr>
<td></td>
<td>University of Texas Health and Science Center</td>
<td>$2,805</td>
</tr>
<tr>
<td></td>
<td>Children's Hospital Boston</td>
<td>$115,703</td>
</tr>
<tr>
<td>MORITA, D</td>
<td>Eisai Medical Service</td>
<td>$33,392</td>
</tr>
<tr>
<td></td>
<td>UCB Biosciences, Inc.</td>
<td>$21,916</td>
</tr>
<tr>
<td>VORHEES, C</td>
<td>Council for the Advancement Pyrethroid</td>
<td>$240,737</td>
</tr>
<tr>
<td>WONG, B</td>
<td>GlaxoSmithKline LLC</td>
<td>$183,228</td>
</tr>
<tr>
<td></td>
<td>Halo Therapeutics, Inc.</td>
<td>$121,169</td>
</tr>
<tr>
<td></td>
<td>Lilly USA, LLC</td>
<td>$73,249</td>
</tr>
<tr>
<td></td>
<td>PTC Therapeutics, Inc</td>
<td>$54,845</td>
</tr>
<tr>
<td></td>
<td>Genethon</td>
<td>$63,269</td>
</tr>
<tr>
<td></td>
<td>Prosensa Therapeutics</td>
<td>$78,966</td>
</tr>
</tbody>
</table>

Current Year Direct Receipts  $2,101,424

Total  $7,424,959