Intellectual and Developmental Disabilities Research Center (IDDRC)

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U54 HD079123
Intellectual and Developmental Disabilities Research Center (IDDRC)

- Provides research services to faculty engaged in research related to the field of IDD at little or no cost
- Funded by NICHD
- IDDRC services include:
  - Consultation and protocol development
  - Registries and recruitment
  - Access to lab and imaging facilities
  - Testing facilities
  - Statistical analyses
  - And more!

- For more info or to request IDDRC services: www.KennedyKrieger.org/IDDRC
IDDRC at Kennedy Krieger

• Joint venture between KKI and JHU
• One of 14 national centers
• Current annual budget ~ $800,000 direct
• Currently: 5 cores and 1 research project
• > 50 faculty/staff from KKI & JHU
• Supports ~100 studies annually
  – Produces ~100 publications annually
• National representation
**IDDRC Affiliated Programs**

- Hugo Moser Research Institute
- Kennedy Krieger Clinics
- F.M. Kirby Research Center for Functional Brain Imaging
- Maryland Center for Developmental Disabilities
- IDDRC National Network
- Mid-Atlantic Consortium of IDDRCs
- The Johns Hopkins Institute for Clinical and Translational Research
- Johns Hopkins Genetic Resources Core Facility
- Eunice Kennedy Shriver National Institute on Child Health and Human Development
- Kennedy Krieger Clinical Trials Unit
- Kennedy Krieger Center for Autism and Related Disorders
- Wendy Klag Center for Autism and Developmental Disabilities
- Leadership in Neurodevelopmental and Other Related Disabilities (LEND) Program at the Kennedy Krieger Institute
- Kennedy Krieger Neuropsychology Research Lab
- Interactive Autism Network
- Association of University Centers on Disabilities
- Center for Innovation and Leadership in Special Education
- Johns Hopkins McKusick-Nathans Institute of Genetic Medicine
KKI IDDRC History

• A Research Institute was established within KKI in 1987
  – An Intellectual and Developmental Disabilities Research Center (called MRRC and MRDDRC at the time) was included as central to the Research Institute.

• Center leadership has changed approximately every 8-9 years, with former directors overlapping with new ones, thus ensuring stability and orderly succession.
  – Michael Cataldo, Ph.D. (2005-2014)
  – Mark Mahone, Ph.D. (2017-present)
IDDRC Era: 30 Years of Progress

<table>
<thead>
<tr>
<th>Category</th>
<th>1987</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Patients Served</td>
<td>2,750</td>
<td>23,946</td>
</tr>
<tr>
<td>Outpatient Appointments</td>
<td>21,789</td>
<td>196,641</td>
</tr>
<tr>
<td>Special Education Students Enrolled</td>
<td>41</td>
<td>563</td>
</tr>
<tr>
<td>Number of Clinical Programs</td>
<td>18</td>
<td>82</td>
</tr>
<tr>
<td>Annual Research Funding</td>
<td>&lt; $1 million</td>
<td>&gt; $35 million</td>
</tr>
<tr>
<td>Faculty and Employees</td>
<td>420</td>
<td>2,640</td>
</tr>
</tbody>
</table>
KGI Specialized Clinics

- Ataxia Telangiectasia Clinic
- Barth Syndrome Clinic
- Bone Disorders Program
- Center for Autism and Related Disorders
- Center for Brain Injury Recovery
- Center for Genetic Muscle Disorders
- Philip A. Keelty Center for Spina Bifida and Related Conditions
- Deafness-Related Evaluations and More (DREAM) Clinic
- Down Syndrome Clinic and Research Center
- Fetal Alcohol Spectrum Disorders Clinic
- Fragile X Clinic
- Genetic Counseling (Neurogenetics)
- Holoprosencephaly and Related Malformations Center
- Hunter Nelson Sturge-Weber Center
- Infant Neurodevelopmental Center
- Infants, Toddlers, and pre-School Years (ITSY) Clinic
- Kabuki Syndrome Clinic
- Metabolism Clinic
- Moser Center for Leukodystrophies
- NICU Clinic
- Infant Hypothermia Disorder (CHD)
- Neuropsychiatry in Epilepsy Program
- Osteogenesis Imperfecta Clinic
- Phelps Center for Cerebral Palsy and Neurodevelopmental Medicine
- Sickle Cell Neurodevelopmental Clinic
- Sleep Clinic (Neurology)
- Rett Syndrome Clinic
- Tuberous Sclerosis Clinic
2014 – Present

- The current Center has supported:

  - 182 Unique Research Projects
  - 129 Principal Investigators
  - 387 Peer-Reviewed Publications
Labs-to-Clinics-to-Community

• Center is central to a scientific enterprise involving investigators working to understand and address IDD

• Nucleus of a larger program of research supported through the Hugo Moser Research Institute
  – Leveraging internationally recognized expertise and infrastructure, Center’s goal is moving knowledge along the continuum from “labs-to-clinics-to-community”
Translational Science

• Involves translation of basic scientific findings from the laboratory into potential treatments and meaningful health outcomes

• For individuals with IDD, interventions may not result in cure
  – Behavioral and cognitive challenges remain
  – Ongoing treatment settings involves schools
  – Opportunity to translate basic and clinical scientific findings in IDD to community practice (e.g., schools) and policies (local/state/national)
What is the T0 to T4 Translational Research Continuum?

- **T1TR**
  - Basic Research
  - Pre-Clinical Studies
  - Clinical Efficacy

- **T2TR**
  - Clinical Effectiveness
  - Dissemination
  - Implementation
  - Impact

- **T0**
  - Basic Research

- **T1**
  - Translation to Humans

- **T2**
  - Translation to Patients

- **T3**
  - Translational to Practice

- **T4**
  - Translation to Communities
Communities: The T4 Translation

Kennedy Krieger Institute

Intellectual & Developmental Disabilities Research Center

at Kennedy Krieger Institute and the Johns Hopkins University School of Medicine

Director: E. Mark Mahone, PhD | Co-Director: S. Ali Fatemi, MD, MBA

Genomics Core
Co-Directors: Jonathan Pevsner, PhD & Kimberly Doheny, PhD

Behavioral Phenotyping Core
Co-Directors: Louis Hagopian, PhD & E. Mark Mahone, PhD

Clinical Translational Core
Co-Directors: S. Ali Fatemi, MD, MBA, Robert Findling, MD, & Sujatha Kannan, MBBS, MD

Research Project
Co-Directors: Mary Ann Wilson, PhD & Sujatha Kannan, MBBS, MD

Administrative Core
Co-Directors: E. Mark Mahone, PhD & S. Ali Fatemi, MD, MBA

Neuroimaging Core
Director: Peter van Zijl, PhD

KennedyKrieger.org/IDDRC
Clinical Translational Core

- Navigation to move ideas from inception to translation
  - Coordination with other IDDRC, KKI, and JHU resources
  - Registries and recruitment of research participants
- Development/implementation of clinical trials (CTU)
  - Regulatory approvals by IRB and FDA
- Consultation on biostatistics and clinical trial design
- Neuroscience facilities, including JHU Microscopy Core, brain histology and animal surgery areas
- Access to JHU Metabolomics Core
- Consultation regarding iPSC development
- Consultation with Carey School of Business faculty
Clinical Trials Unit - Examples

ASD

• **Investigational Product Mechanism:** BALOVAPTAN

• **Study Objective:** To evaluate the efficacy of 24-week treatment with balovaptan (RO5285119) compared to placebo

• **Basic Eligibility:**
  – Age 5-17 years old
  – DSM-5 criteria for ASD or ICD10 criteria for Autism diagnosis confirmed by ADOS-2 criteria
  – IQ ≥ 70

• **Compensation:** $50.00 for each completed study visit.

• **Participation** will last approximately 30 weeks and will include approximately 7 visits to KKI.
Clinical Trials Unit - Examples

ADHD

• **Investigational Device:** Device/iPAD game
• **Study Objectives:** Determine the effects of combining AKL-T01 (with AKL-X01 symptom tracking) as adjunctive treatment to stimulant medication
• **Basic Eligibility:**
  – Children ages 8-14 years inclusive at the time of consent
  – Diagnosis of ADHD according to the Diagnostic and Statistical Manual of Mental Disorders-V (DSM-V), confirmed with the Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID)
  – Impairment Rating Scale (Parent Report) score of ≥3
• **Compensation:** $125.00 for each completed study visit.
• **Participation** will last approximately 84 days and will include approximately 4 visits to KKI
Genomics Core

• Partnership with Johns Hopkins Genomics and the Institute of Genetic Medicine
  – CLIA compliant laboratory facilities
  – Clinical exome testing, whole exome sequencing (WES) and whole genome sequencing (WGS) services
    – Molecular cytogenetics and microarray
• Tissue culture and cell repository
• Bioinformatics and software development
Neuroimaging Core

• Access to resources of FM Kirby Center for Functional Brain Imaging and faculty
  – Education (courses) and technical support
  – Two 3.0T and one 7.0T scanners for humans, and 11.7T and 17.6T high resolution small animal scanners
  – Anatomic imaging (volume, shape, morphology)
  – Functional MRI (task- and non-task based)
  – Diffusion tensor imaging (DTI)
  – MR spectroscopy
  – Transcranial magnetic stimulation (TMS)
Behavioral Phenotyping Core

- Development of outcome measures for clinical trials
- Full range of deep behavioral phenotyping methods
- Examination of relationships between behavioral phenotypes and other biomarkers (genetic, epigenetic, physiological, neuroimaging)
- Quantitative study of movement and motor learning
- Development of methods for electrophysiology and ERP studies
- Comprehensive neuropsychological testing facilities
- Assistance with preparation for procedures
- Clinical registry of phenotyped patients
Research Project

• Focused on reducing brain damage in infants exposed to perinatal hypoxia-ischemia (HI), employing a mouse model to examine post-injury impacts of intervention
  – Evaluate the cellular distribution of D-NAC within microglia, astrocytes and neurons, when administered immediately after HI, at the onset of rewarming, or 24h after HI, with or without therapeutic hypothermia
  – Compare the neuroprotective efficacy achieved by hypothermia alone, D-NAC alone, and hypothermia in combination with D-NAC, in P7 mice subjected to HI
Administrative Core

• Management and coordination of Center activities
  – Website, newsletters, lectures
• Setting policies for ensuring that Core services reflect the highest standards of quality and efficiency
• Developing interactions with other Centers
• Coordinating efforts among LEND, MCDD, and AUCD
• Contributing to the training of students and early career professionals (e.g., MCDD trainings)
• Outreach, communication, and advocacy via AUCD
• Network of interdisciplinary centers advancing policy and practice for and with individuals with developmental and other disabilities, their families, and communities
  – UCEDD (67)
  – LEND (52)
  – IDDRC (14)
• Federal partners: MCHB, NICHD, CDC, ADD
• Leadership on major social problems affecting all people with developmental or other disabilities or special health needs
• Advocacy with Congress and executive branch agencies that fund and regulate programs used by people with disabilities
• Networking and partnering with other national organizations to advance the network's national agendas
• Promoting communication within the network and with other groups by collecting, organizing, and disseminating data on network activities and accomplishments
• Technical assistance provision on a broad range of topics
Linking IDDRC Discoveries to Advocacy via MCDD

- U.S. Department of Labor, Office of Disability Employment Policy, Community of Practice on youth receiving SSI
- Council of Parent Attorneys and Advocates
- Maryland Community of Practice for Supporting Families
- The Maryland Disability and Health Inclusion Program
- Maryland Department of Health, DDA, Quality Advisory Council
- Maryland Developmental Disabilities Council,
- Coalition to Reform School Discipline in Maryland
- Education Advocacy Coalition for Students with Disabilities
- First Maryland Disability Trust, Inc.
- Collaborative Law Project
- The Arc of Baltimore
- Maryland Commission on Caregiving
- Maryland Respite Care Coalition
CILSE (est. 2012)

• Translate scientific discoveries in IDD into educational practice and policy

• Train future educational leaders, leveraging IDDRC, LEND, and UCEDD resources at KKI
  – Training for mid-career educators
    • Didactics
    • Interdisciplinary experiences
    • Immersion in neuroscience and behavioral research
    • Full participation in LEND activities

• Outreach, advocacy, teaching, training
Center for Innovation & Leadership in Special Education

Fellowship Program Core Content Areas

- Neuroscience of Learning & the Learner
  - Exposure to neurodevelopmental learning disorders
  - Participation in clinical- and research-based treatment activities

- Principles of Behavior Change
  - Exposure to principles of applied behavior analysis
  - Supervised experiences within inpatient hospital units and outpatient clinics

- Leadership, Law, & Management Principles
  - Study special education case law
  - Work within Project HEAL at Kennedy Krieger Institute

- Knowledge Acquisition & Evidence-Based Practice
  - Collaboration in research
  - Independent research, manuscript and grant preparation, manuscript review, and research presentation
Project UNITE
(UNITING NeuroscIENCE, Innovative Teaching & Education)

Spread Innovation.

Center for Innovation and Leadership in Special Education
at Kennedy Krieger Institute

Teachers: 83
1:1 Consultations: 155
Students: 2,354
Project UNITE
(Uniting Neuroscience, Innovative Teaching & Education)

- 19 graduates since 2012
- Transition to blended learning grad certificate

- Teach for America
- Urban Teachers
- Towson University
- Center for Applied Special Technology (CAST)
- MD State Dept. Education

Center for Innovation & Leadership in Special Education
Professional Development and Instructional Coaching Services

IN: 170 teachers, 20 administrators
TX: 19 teachers, 4 administrators
IN: 40 teachers & administrators

Estimated
NATIONAL IMPACT

Teachers: 83
1:1 Consultations: 155
Students: 2,354
Weekly Blog
“Linking Research to Classrooms”
2019 Center News

• Competitive renewal 2020
  – Submission likely January 2020

• Bridge funding
  – June 1, 2019-May 31, 2020

• Recruitment for research project for new submission
  – Details forthcoming in April 2019
  – Embedded project 5 years
  – Leverages IDDRC Cores
  – Annual budget ~$150-175 direct costs
IDDRC Supported Discoveries

- Diagnosis/treatment of adrenoleukodystrophy
- Discovery of the gene causing Sturge-Weber syndrome
- Novel therapeutic trials for girls with Rett syndrome
- Clarifying brain pathology in CP using DTI
- Understanding the neural basis of ASD
- Improving treatment outcomes for severe behavior disorders
- Optimizing motor learning/relearning for hemiparesis
Eligibility For IDDRC Support

• Any Kennedy Krieger Institute or Johns Hopkins University faculty member engaged in research of relevance to IDD

• To access IDDRC support, faculty must have at least one funded project that is relevant to IDD

• Graduate students and postdoctoral fellows are encouraged to access IDDRC resources through primary IDDRC investigators/mentors
What Will the IDDRC Do For You?

• Access to IDDRC Core services
• Discounted fees for Core services
• Access to news, ideas, and research related to IDD
• Access to education, funding, and advancement opportunities
• Ability to include a description of the resources, services, and expertise included in the IDDRC cores, and available to your proposed project, in grant applications
• Ability to present research and findings through IDDRC-sponsored lectures, symposia, and seminars
Investigator Resources

- NIH Biosketch
- My Bibliography
- SciENcv
- NCBI
- PubMed Central
Responsibilities of IDDRC Supported Investigators

• Conduct research in accordance with IDDRC mission
• Utilize proper IDDRC NIH acknowledgement (NIH U54 HD079123) for all publications and presentations benefitting from core services
• Report progress regularly on research activities, grants, and publications relating to IDDRC-supported projects
• Complete annual evaluation of IDDRC core services
• Contribute to scientific dialogue through IDDRC lectures, symposia, communications, and seminars
To Access IDDRC Services

• Contact Mark Mahone, Ali Fatemi, or Erin Jones
• Contact any of the Core Directors
• Complete a Services Request Form to request Core support
  – Available on the IDDRC website (https://iddrc.kennedykrieger.org)
What We Need

• Contact us for assistance with new projects before they are submitted
• Let us know about any new funding for research (federal, foundation, donor)
• Keep us posted on new publications and discoveries
• Join the IDDRC as an affiliated faculty member