Network Analysis of Collaborations

Jane Joseph, PhD
Medical University of South Carolina

South Carolina Autism and Neurodevelopmental Disorders Symposium & SCTR retreat
March 1, 2019

Acknowledgements: Graham Warner and Brandon Vaughan
SCAND mission

**Mission:** to drive research excellence in South Carolina for clinical, translational and mechanistic studies aimed at understanding and treating neurodevelopmental and autism spectrum disorders through a state-wide, multi-disciplinary research consortium.

**Co-founders:** Jeff Twiss and Jane Roberts
SCAND membership and Institutional Representation
SCAND collaborations

- Polled SCAND members about grants and manuscripts they had submitted with other SCAND members
- Included both those that had been published or awarded and those that had not
- The number of grants & manuscripts submitted/awarded between SCAND members was then used to create a “network of collaborations”
Each member is represented as a circle (node)

Number of grants and manuscripts between any two members is represented by the thickness of the connection (edge)
Who is most strongly connected in this network?

Network property of **strength** or **eigenvector centrality**

Which member would you want to contact to get the word out to as many members as possible?
Who is most strongly connected in this network?

Network property of **strength** or **eigenvector centrality**

Which member would you want to contact to get the word out to as many members as possible?
Who are hubs in the network?

Network property of **betweenness centrality**

Which member connects otherwise disconnected components of the network?
Who are hubs in the network?

Network property of *betweenness centrality*

Which member connects otherwise disconnected components of the network?
More information on SCAND collaborations and funding:
Who are hubs in the network?

Network property of *betweenness centrality*

Which member connects otherwise disconnected components of the network?
Intersection of epigenetic regulation and mitochondrial function in autism (18-SR04)

J Twiss, K Champaigne, L Bocutto, L Freeman, S Lizarraga, and O Bagasra

(co-I's: Norma Frizzell, Sajish Mathew, Jill Turner, Charlie Holman)
(Advisors: Chris Cowan, Jane Joseph, Jane Roberts, Anand Srivastava)
Comprehensive Inter-Institutional Approach to Autism and Neurodevelopmental Disorders in SC?

- Metabolomic & genetic studies
- Mouse models
- Cell-based models (iPSC & primary neurons)
- Human Phenotyping
Program Objectives

The Stimulus Research Program was developed to strengthen South Carolina’s research capacity and research competitiveness by funding projects that have strong scientific bases to solve complex problems through collaboration among South Carolina colleges and universities and through the integration of life science, physical science, engineering, and mathematics. The specific Program objectives are:

• Increase the research capacity of the investigators and their institutions
• Increase research collaboration and inclusion among colleges and universities
• Position collaborative teams to pursue large-scale national funding for research

Proposal Topics

Proposers are strongly encouraged to address topics consistent with South Carolina Vision 2025 - Advancing South Carolina’s Capacity and Expertise in Science and Technology and the research themes of the NSF Big Ideas.
Luigi Boccuto, M.D.  

Tryptophan → Serotonin → Melatonin  

Sofia B. Lizarraga, Ph.D.  

Kynurenine → Quinolinate  

Kevin Champaigne, Ph.D.  

Kynurenate → NAD⁺  

Sarachana & Hu (2013) Mol Autism  

Omar Bagasra, M.D., Ph.D.  

Silenced Genes → HAT Inhibitors → Hypersensitive Apoptosis  

Furman  

Linea Freeman, Ph.D.  

Changing What’s Possible | MUSC.edu
NAD metabolism as a target for neuroprotection

from: Chiaguri et al. (2012) Nat Rev Cancer
OBJECTIVE – Use the intersections of epigenetic ASD susceptibility, metabolic dysfunction as an indicator of ASD pathophysiology, and molecular phenotype for sex differences in ASD susceptibility as a foundation upon which to build a collaborative research program across institutions in South Carolina.

AIM 1 – Transcriptional dysregulation in ASD neural cells
AIM 2 – Metabolic dysregulation in ASD models
AIM 3 – Metabolic rescue of ASD by targeting TRP Metabolism

Intersection of epigenetic regulation and mitochondrial function in autism (18-SR04)
Jan, 2018 - Anticipated Award announced
Mar 1, 2018 - Funding started, 2 years @ $300k TOTAL
Jun 22, 2018 - Progress Meeting
Pilot Project Funding Opportunities

Dayan Ranwala, PhD
Associate Director
SCTR Pilot Project Program and Team Science Program
ranwala@musc.edu

https://research.musc.edu/resources/sctr/funding-opportunities/pilot-projects
Pilot Project Grants Overview

• To facilitate new and innovative, scientifically meritorious, clinical and translational research while enhancing interdisciplinary team science and new collaborations leading to extramural grant support and to disseminate research findings

• To promote scientific interactions among many disciplines and the community to accelerate the processes from discovery and innovation to improved patient care

• To provide research support for highly promising junior faculty to shorten the time to research independence

• Development of potential Intellectual Property (IP) and commercialization of technologies, if applicable
RFAs and Grant Categories

**Discovery Grants RFA:**
- Release in Fall
- Up to $25,000 for a 12-month period (It will be shared with you once released).

**High Innovation High Rewards Grants RFA:**
- Rolling basis
- Up to $10,000 for a 12-month period

**Telehealth Grants RFA:**
- Active RFA; Pre-application (required) Due by 5 PM EST on March 22, 2019
- Up to $25,000 for a 12-month period
SCTR RESOURCES & CONSULTATIONS

- Science Consults
- **Extramural Grant Review Assistance Services**
- Biostatistics, Design and Epidemiology Consults
- Community Engagement Research Consults
- Recruitment Services; Special Populations Navigation
- Biomedical Informatics Center; Research Data Requests
- Telehealth Research Services
- Novel Device or Smart App Development
- Tech Transfer - Intellectual Property and Commercialization Resources
- Comparative Effectiveness and Data Analytics Research Resource (CEDAR)
- Clinical Trials Design Center; Trial Innovation Network
- Regulatory Services; Grant Forms; Knowledge Services
- Intellectual Property and Commercialization Resources
SCTR Grant Acknowledgment

Please remember to acknowledge the **SCTR Grant Number**

*UL1 TR001450*

in your grant applications, publications, press release or any other documents if it is a result of the SCTR support.
# Funding Opportunity Announcements

**Neurodevelopmental Disorders Research Retreat**

### National Institute of Health (NIH)

<table>
<thead>
<tr>
<th>Program Description</th>
<th>PA/R21 Numbers</th>
<th>Deadline</th>
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<tr>
<td>NICHDD Research Education Programs (R25)</td>
<td>PAR-18-217</td>
<td>May 25, 2019</td>
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<tr>
<td>NIMH Biobehavioral Research Awards for Innovative New Scientists (NIMH BRAINS) (R01)</td>
<td>RFA-MH-18-200</td>
<td>Jun 20, 2019</td>
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<td>Global Brain and Nervous System Disorders Research Across the Lifespan (R01)</td>
<td>PAR-18-835 (R21) PAR-18-836</td>
<td>Nov 7, 2019</td>
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<td>Research on Autism Spectrum (R01)</td>
<td>PA-18-401; (R21) PA-18-400; (R03) PA-18-399</td>
<td>Standard Dates</td>
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<td>NIMH Career Enhancement Award to Advance Autism Services for Adults and Transition-Age Youth (K18)</td>
<td>RFA-MH-19-101 &amp; RFA-MH-19-100</td>
<td>Jun 21, 2019</td>
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<td>Chronic Condition Self-Management in Children and Adolescents (R01)</td>
<td>PA-18-151</td>
<td>June 5, 2019 &amp; Oct 5, 2019</td>
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<td>Comparative Biology of Neurodegeneration (R21)</td>
<td>PAR-17-039</td>
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<td>Transformative Research Award for the INCLUDE (Investigation of Co-occurring Conditions across the Lifespan to Understand Down syndrome) Project (R01)</td>
<td>RFA-OD-19-016</td>
<td>Mar 14, 2019</td>
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<tr>
<td>Cellular and Molecular Biology of Complex Brain Disorders (R01)</td>
<td>PAR-17-309 &amp; (R21) PAR-17-310</td>
<td>Standard Dates</td>
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<tr>
<td>Basic Neurodevelopmental Biology of Circuits and Behavior (R01)</td>
<td>PAR-19-027 &amp; (R21) PAR-19-028</td>
<td>Standard Dates</td>
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To schedule a Funding Session, contact: Wanda Hutto Pierce at piercewh@musc.edu.
Funding Opportunity

Announcements

Neurodevelopmental Disorders Research Retreat

Foundations

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<th>Organization</th>
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<td>FRAXA Research Foundation</td>
<td>Next cycle opens March 1, 2019</td>
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<td>Clinical Trial Grants</td>
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<td>Fellowships</td>
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<td>Deadline: February 1, 2020</td>
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<td>The Waterloo Foundation</td>
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<tr>
<td>Developmental Trauma &amp; Sleep and/or Exercise</td>
<td>March 3, 2019</td>
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<tr>
<td>Motor Impairments &amp; Diet and/or Microbiome</td>
<td>June 30, 2019</td>
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<td>WITH Foundation</td>
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<td>Autism Speaks</td>
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<td>Adult Transition Research Grants</td>
<td>LOI: March 13, 2019; Application: May 23, 2019</td>
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<td>Dataset Analysis Grant</td>
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<td>Deadline: April 10, 2019</td>
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<td>Simons Foundation (SFARI) Grants</td>
<td>Deadline: April 18, 2019</td>
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Find Funding with Grant Forward

Take advantage of MUSC's subscription to Grant Forward, a comprehensive funding opportunities database that features customized funding searches. Grant Forward is available to faculty, staff and students. Access is available via the campus network.

Explore Grant Forward

To schedule a Funding Session, contact: Wanda Hutto Pierce at piercewh@musc.edu