CURRICULUM VITAE

The Johns Hopkins University School of Medicine

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 22 July 2021

Mary Beth Nebel

**DEMOGRAPHIC AND PERSONAL INFORMATION**

**Current Appointments**

University

2017-present Assistant Professor, Department of Neurology, Johns Hopkins University School of Medicine

2016-present Affiliated Faculty, Wendy Klag Center for Autism & Developmental Disabilities, Johns Hopkins Bloomberg School of Public Health

Hospital N/A

Other

2015-present Research Scientist, Center for Neurodevelopmental and Imaging Research, Kennedy Krieger Institute

**Personal Data**

Business Address

Kennedy Krieger Institute

716 N. Broadway, room 311

Baltimore, MD 21205

Tel (443) 923-9257

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**Education and Training**

Undergraduate

1998-2002 B.S.E., Biomedical Engineering, Duke University, Durham, NC

Research Advisor: Roger Nightingale

Doctoral/Graduate

2005-2010 Ph.D., Joint Department of Biomedical Engineering, University of North Carolina & North Carolina State University, Chapel Hill, NC

Dissertation: Functional imaging of central mechanisms underlying human pain perception

Advisors: Gregory Essick & Mark Tommerdahl

Postdoctoral

2010-2015 Postdoctoral Research Fellowship, Neurology, Johns Hopkins School of Medicine, Baltimore, MD

Focus: Neuorimaging and behavioral methods for investigating sensorimotor deficits in autism

Advisor: Stewart Mostofsky

**Professional Experience**

2002-2003 Data Technician, Department of Psychiatry, Washington University School of Medicine

2003-2005 Associate in Research, Duke-UNC Brain Imaging and Analysis Center, Duke University

2010-2013 Junior Contract Editor, American Journal Experts

2015-2016 Instructor, Department of Neurology, Johns Hopkins University School of Medicine

**PUBLICATIONS**

Original Research [OR]

1. Rathnanther J, Wang L, **Nebel MB**, Hosakere M, Han X, Csernansky J, Miller M. Validation of semiautomated methods for quantifying cingulate cortical metrics in schizophrenia. Psychiatry Research. 2004; 132(1): 53-68.
2. Selemon L, Wang L, **Nebel MB**, Csernansky J, Goldman-Rakic P, Rakic P. Direct and indirect effects of fetal irradiation on cortical gray and white matter volume in the macaque. Biological Psychiatry. 2005; 57(1): 83-90.
3. **Nebel MB**, Sims E, Keefe F, Kraus V, Guilak F, Caldwell D, Pells J, Queen R, Schmitt D. The relationship of self-reported pain and functional impairment to gait mechanics in overweight and obese persons with knee osteoarthritis. Arch Phys Med Rehabil. 2009; 90:1874-79.
4. **Nebel MB**, Folger S, Tommerdahl M, Hollins M, McGlone F, Essick G. Temporomandibular disorder modifies cortical response to tactile stimulation. J Pain. 2010; 11:1083-94.
5. Cascio C, Moana-Filho E, Guest S, **Nebel MB**, Weisner J, Baranek G, Essick G. Perceptual and neural response to affective tactile texture stimulation in adults with Autism Spectrum Disorders. Autism Research. 2012; 5(4): 231-244.
6. Eloyan A, Muschelli J, **Nebel MB**, Liu H, Han F, Zhao T, Barber A, Joel S, Pekar J, Mostofsky S, Caffo B. Automated diagnoses of attention deficit hyperactive disorder using magnetic resonance imaging. Frontiers in Systems Neuroscience. 2012; 6: 61.
7. Shou H, Eloyan A, Lee S, Zipunnikov V, Crainiceanu AN, **Nebel MB**, Caffo B, Lindquist M, Crainiceanu C. Quantifying the reliability of image replication studies: The image intraclass correlation coefficient (I2C2). Cognitive, Affective, Behavioral Neuroscience. 2013; 13(4): 714-724.
8. Di Martino A, Yan C, Li Q, Denio E, Castellanos F, Alaerts K, Anderson J, Assaf M, Bookheimer S, Dapretto M, Deen B, Delmonte S, Dinstein I, Ertl-Wagner B, Fair D, Gallagher L, Kennedy D, Keown C, Keysers C, Lainhart J, Lord C, Luna B, Menon V, Minshew N, Monk C, Mueller S, Muller R, **Nebel MB**, Nigg J, O'Hearn K, Pelphrey K, Peltier S, Rudie S, Sunaert S, Thioux M, Tyszka J, Uddin L, Verhoeven J, Wenderoth N, Wiggins J, Mostofsky S, Milham M. The autism brain imaging data exchange: towards a large-scale evaluation of the intrinsic brain architecture in autism. Molecular Psychiatry. 2014; 19(6): 659-667.

Role: Prepared Kennedy Krieger’s contribution to the data exchange and contributed to the critical revision of the manuscript

1. **Nebel MB**, Joel SE, Muschelli J, Barber A, Caffo B, Pekar JJ, Mostofsky S. Disruption of functional organization within the primary motor cortex in children with autism. Human Brain Mapping. 2014; 35:567-580.
2. \*Muschelli J, \*+**Nebel, MB**, Caffo B, Barber A, Pekar JJ, Mostofsky S. Reduction of motion-related artifacts in resting state fMRI using aCompCor. NeuroImage. 2014; 96:22-35, 2014.

Role: \*contributed equally to all aspects of the manuscript; +corresponding author

1. Lindquist M, Xu Y, **Nebel MB**, Caffo B. Evaluating dynamic bivariate correlations in resting-state fMRI: A comparison study and a new approach. NeuroImage. 2014; 101:531-46.
2. Eloyan A, Shou H, Shinohara R, Sweeney E, **Nebel MB**, Cuzzocreo J, Calabresi P, Reich D, Lindquist M, Crainiceanu C. Health effects of lesion localization in multiple sclerosis: spatial registration and confounding adjustment. PloS One. 2014; 9(9): e107263. Role: performed data analysis and wrote parts of the manuscript
3. **Nebel MB**, Eloyan A, Barber A, Mostofsky S. Precentral gyrus functional connectivity signatures of autism. Frontiers in Systems Neuroscience. 2014; 8:80. doi: 10.3389/fnsys.2014.00080.
4. Shou H, Eloyan A, **Nebel MB**, Mejia A, Pekar JJ, Mostofsky S, Caffo B, Lindquist M, Crainiceanu C. Shrinkage prediction of seed-voxel brain connectivity using resting state fMRI. NeuroImage. 2014; 102(2): 938-44.
5. Barber A, Jacobson L, Wexler J, **Nebel MB**, Caffo B, Pekar JJ, Mostofsky S. Connectivity supporting attention in children with Attention Deficit Hyperactive Disorder. NeuroImage Clinical. 2015; 7: 68-81.
6. Mejia AF, **Nebel MB**, Shou H, Crainiceanu C, Pekar JJ, Mostofsky S, Caffo B, Lindquist M. Improving reliability of subject-level resting-state fMRI parcellation with shrinkage estimators. NeuroImage*.* 2015; 112: 14-29.
7. Sharer E, Crocetti D, Muschelli J, Barber AD, **Nebel MB**, Caffo BS, Pekar JJ, Mostofsky SH. Neural correlates of visuomotor learning in autism. Journal of Child Neurology. 2015; 30(14): 1877-1886.
8. **Nebel MB**, Eloyan A, Nettles CA, Sweeney KL, Ament K, Ward RE, Choe AS, Barber AD, Pekar JJ, Mostofsky SH. Intrinsic visual-motor synchrony correlates with social deficits in autism. Biological Psychiatry. 2016; 79(8): 633-41.
9. Floris DL, Barber AD, **Nebel MB**, Martinelli MC, Lai M, Crocetti D, Baron-Cohen S, Suckling J, Pekar JJ, Mostofsky SH. Atypical lateralization of motor circuit functional connectivity in children with autism is associated with motor deficits. Molecular Autism. 2016; 7(1): 35.
10. Landa RJ, Haworth JL, **Nebel MB**. Ready, set, go! Low anticipatory response during a dyadic task in infants at high familial risk for autism. Frontiers in Psychology. 2016; 7: 721.
11. Dajani DR, Llabre MM, **Nebel MB**, Mostofsky SH, Uddin LQ. Heterogeneity of executive functions among comorbid neurodevelopmental disorders. Scientific Reports. 2016; 6: 36566. doi: 10.1038/srep36566.
12. Mejia AF, **Nebel MB**, Eloyan A, Caffo B, Lindquist MA. PCA leverage: Outlier detection for high-dimensional functional magnetic resonance imaging data. Biostatistics. 2017;18(3): 521-36.
13. Di Martino A, O'Connor D, Chen B, Alaerts K, Anderson J, Assaf M, Balsters J, Baxter L, Beggiato A, Bernaerts S, Blanken L, Bookheimer S, Braden BB, Byrge L, Castellanos F, Dapretto M, Delorme R, Fair D, Fishman I, Fitzgerald J, Gallagher L, Jao Keehn RJ, Kennedy D, Lainhart J, Luna B, Mostofsky S, Müller RA, **Nebel MB**, Nigg J, O'Hearn K, Solomon M, Toro R, Vaidya C, Wenderoth N, White T, Craddock C, Lord C, Leventhal B, Milham M. Enhancing studies of the connectome in autism using the Autism Brain Imaging Data Exchange II. Scientific Data. 2017; 4: 170010. doi: 10.1038/sdata.2017.10.

Role: Prepared Kennedy Krieger’s contribution to the data exchange and contributed to the critical revision of the manuscript

1. Chen S, Huang L, Qiu H, **Nebel MB**, Mostofsky SH, Pekar JJ, Lindquist MA, Eloyan A, Caffo BS. Parallel group independent component analysis for massive fMRI data sets. PloS One. 2017; 12(3): e0173496*.*

Role: Preprocessed the neuroimaging data; contributed to the interpretation of the results and the critical revision of the manuscript

1. Dirlikov B, Younes L, **Nebel MB**, Martinelli MK, Tiedemann AN, Koch CA, Fiorilli D, Bastian A, Denckla MB, Miller MI, Mostofsky SH. Novel Automated Morphometric and Kinematic Handwriting Assessment: A validity study in children with ASD and ADHD. Journal of Occupational Therapy, Schools, Early Intervention. 2017; 10(2): 185-201*.*

Role: Designed the setup for digitizing the handwriting task; helped make data analysis more tractable by implementing it on a high-performance computing cluster; assisted with figure generation; contributed to the interpretation of results and the critical revision of the manuscript

1. Choe AS, **Nebel MB**, Barber AD, Cohen JR, Xu Y, Pekar JJ, Caffo BS, Lindquist MA. Comparing test-retest reliability of dynamic functional connectivity methods. NeuroImage. 2017; 158: 155-75.
2. Calhoun VD, Wager TD, Krishnan A, Rosch KS, Seymour KE, **Nebel MB**, Mostofsky SH, Nyalakanai P, Kiehl K. The impact of T1 vs EPI spatial normalization templates for fMRI data analyses. Human Brain Mapping. 2017; 38(11): 5331-42*.*
3. Stephens JA, Salorio CF, Gomes JP, **Nebel MB**, Mostofsky SH, Suskauer SJ. Response Inhibition Deficits and Altered Motor Network Connectivity in the Chronic Phase of Pediatric TBI. Journal of Neurotrama.2017; 34(22): 3117-23*.*
4. Stoodley CJ, D’Mello AM, Ellegood J, Jakkamsetti V, Liu P, **Nebel MB**, Gibson JM, Kelly E, Meng F, Cano C, Pascual JM, Mostofsky SH, Lerch JP, Tsai PT. Altered cerebellar connectivity in autism spectrum disorders and rescue of autism-related behaviors in mice.Nature Neuroscience. 2017; 20(12): 1744-51*.*

Role: Preprocessed and analyzed the pediatric neuroimaging data; generated figures; contributed to the interpretation of the results and the critical revision of the manuscript

1. Mejia AF, **Nebel MB**, Barber AD, Choe AS, Pekar JJ, Caffo BS & Lindquist MA. Improved estimation of subject-level functional connectivity using full and partial correlation with empirical Bayes shrinkage. NeuroImage. 2018; 172: 478-91.
2. Rosch KS, Mostofsky SH & **Nebel MB**. ADHD-related sex differences in fronto-subcortical intrinsic functional connectivity and associations with delay discounting. Journal of Neurodevelopmental Disorders. 2018; 10(1): 34.
3. Dajani DR, Burrows CA, Odriozola P, Baez A, **Nebel MB**, Mostofsky SH & Uddin LQ. Investigating functional brain network integrity using a traditional and novel categorical scheme for neurodevelopmental disorders. NeuroImage Clinical. 2019; 21, 101678.
4. Dajani DR, Burrows CA, **Nebel MB,** Mostofsky SH, Gates KM, Uddin LQ. Parsing heterogeneity in autism spectrum disorder and attention-deficit/hyperactivity disorder with individual connectome mapping. Brain Connectivity. 2019; 9(9): 673-691.
5. Henry TR, Duffy KA, Rudolph MD, **Nebel MB**, Mostofsky SH, Cohen JR. Bridging global and local topology in whole-brain networks using the network statistic jackknife. Network Neuroscience. 2020; 4(1): 70-88.
6. D’Souza NS, **Nebel MB**,Wymbs N, Mostofsky SH, Venkataraman A. A joint network optimization framework to predict clinical severity from resting state functional MRI data. NeuroImage. 2020; 206: 116314
7. Mejia AF, **Nebel MB**, Wang Y, Caffo BS, Guo Y. Template independent component analysis: targeted and reliable estimation of subject-level brain networks using big data population priors. Journal of the American Statistical Association. 2020; 115(531): 1151-117.
8. Wymbs, NF, **Nebel MB**, Ewen JB, Mostofsky SH. Altered inferior parietal functional connectivity is correlated with praxis and social skill performance in children with autism spectrum disorder. Cerebral Cortex. 2020; 31(5): 2639-52.
9. Lidstone DE, Rochowiak R, Mostofsky SH, **Nebel MB**. A data approach reveals that anomalous motor system connectivity is associated with the severity of core autism symptoms. Autism Research. 2021 Jan 22; doi: 10.1002/aur.2476.
10. Schirmer MD, Venkataraman A, Rekik I, Kim M, Mostofsky SH, **Nebel MB**, Rosch K, Seymour K, Crocetti D, Irzan H, Hutel M, Ourselin S, Marlow N, Melbourne A. Levchenko E, Zhou S, Kunda M, Lu H, Dvornek NC, Zhuang J, Pinto G, Samal S, Zhang J, Bernal-Rusiel J, Pienaar R, Chung AW. Neuropsychiatric disease classification using functional connectomics-results of the connectomics in neuroimaging transfer learning challenge. Medical Image Analysis. 2021; 70: 101972.

Role: Contributed to the design of the Connectomics in Neuroimaging Transfer Learning Challenge at the 22nd International Conference on Medical Image Computing and Computer Assisted Intervention, prepared the Challenge dataset, and contributed to the critical revision of the manuscript.

1. Risk BB, Murden RJ, Wu J, **Nebel MB**, Venkataraman A, Zhang Z, Qui D. Which multiband factor should you choose for your resting-state fMRI study? NeuroImage 2021; 234: 117965.
2. Duffy KA, Rosch KS, **Nebel MB**, Seymour KE, Lindquist MA, Pekar JJ, Mostofsky SH, Cohen JR. Increased integration between default mode and task-relevant networks in children with ADHD is associated with impaired response control. Developmental Cognitive Neuroscience. 2021; 50: 100980.
3. Augustine F, **Nebel MB**, Mostofsky SH, Mahone EM, Singer HS. Aberrant prefrontal cortical-striatal functional connectivity in children with primary complex motor stereotypies. Cortex. 2021; 142: 272-82.
4. Zhao Y, **Nebel MB**, Caffo BS, Mostofsky SH, Rosch KS. Beyond massive univariate tests: Covariance regression reveals complex patterns of functional connectivity related to attention-deficit/hyperactivity disorder, age, sex, and response control. Biological Psychiatry Global Open Science. 2021 June 19; doi: 10.1016/j.bpsgos.2021.06.003.
5. Chen C, Lidstone D, Crocetti D, Mostofsky SH, **Nebel MB**. Increased interhemispheric somatomotor functional connectivity and mirror overflow in ADHD. NeuroImage: Clinical 2021; 31: 102759.
6. D’Souza NS, **Nebel MB**, Crocetti D, Robinson J, Wymbs N, Mostofsky SH, Venkataraman A. Deep sr-DDL: Deep structurally regularized dynamic dictionary learning to integrate multimodal and dynamic functional connectomics data for multidimensional clinical characterizations. NeuroImage 2021; 241: 118388.
7. Hawks ZW, Todorov A, Marrus N, Nishino T, Talovic M, **Nebel MB**, Girault JB, Davis S, Marek S, Seitzman BS, Eggebrecht AT, Elison J, Dager S, Mosconi MW, Tychsen L, Snyder AZ, Botteron K, Estes A, Evans A, Gerig G, Hazlett HC, McKinstry RC, Pandey J, Schultz R, Styner M, Wolff JJ, Zwaigenbaum Z, Markson L, Petersen SE, Constantino JN, White DA, Piven J, Pruett JR. A prospective evaluation of infant cerebellar-cerebral functional connectivity in relation to behavioral development in autism. Biological Psychiatry Global Open Science 2021. doi: [10.1016/j.bpsgos.2021.12.004](https://doi.org/10.1016/j.bpsgos.2021.12.004)

Review Articles [RA]

1. **Nebel MB**, Gracely R. Neuroimaging of fibromyalgia. Rheum Dis Clin North America. 2009; 35(2): 313-27.
2. Song Y, Lally PJ, Yanez Lopez M, Oeltzschner G, **Nebel MB**, Gagoski B, Kecskemeti S, Hui SCN, Zöllner HJ, Shukla D, Arichi T, De Vita E, Yedavalli V, Thayyil S, Fallin D, Dean DC 3rd, Grant PE, Wisnowski JL, Edden RAE. Edited magnetic resonance spectroscopy in the neonatal brain. Neuroradiology. 2022; 64(2): 217-232.
3. Doss MK, Madden MB, Gaddis A, **Nebel MB**, Griffiths RR, Mathur BN, Barrett FS. Models of psychedelic drug action: modulation of cortical-subcortical circuits. Brain 2021. doi: 10.1093/brain/awab406.

Proceedings Reports [PR]

1. Venkataraman A, Wymbs N, **Nebel M**, Mostofsky S. A Unified Bayesian Approach to Extract Network-Based Functional Differences from a Heterogeneous Patient Cohort. In Proc: CNI: International Workshop on Connectomics in NeuroImaging. 2017; 1-8.
2. D’Souza NS, **Nebel MB**, Wymbs N, Mostofsky S, Venkataraman A. A Generative-Discriminative Basis Learning Framework to Predict Clinical Severity from Resting State Functional MRI Data. In: Frangi A., Schnabel J., Davatzikos C., Alberola-López C., Fichtinger G. (eds) Medical Image Computing and Computer Assisted Intervention – MICCAI 2018. MICCAI 2018. Lecture Notes in Computer Science, vol 11072. Springer, Cham. https://doi.org/10.1007/978-3-030-00931-1\_19.
3. D’Souza NS, **Nebel MB**, Wymbs N, Mostofsky S, Venkataraman A. Integrating Neural Networks and Dictionary Learning for Multidimensional Clinical Characterizations from Functional Connectomics Data. In: Shen D. et al. (eds) Medical Image Computing and Computer Assisted Intervention – MICCAI 2019. MICCAI 2019. Lecture Notes in Computer Science, vol 11766. Springer, Cham. https://doi.org/10.1007/978-3-030-32248-9\_79.
4. D’Souza NS, **Nebel MB**, Crocetti D, Wymbs N, Robinson J, Mostofsky S, Venkataraman A. A Deep-Generative Hybrid Model to Integrate Multimodal and Dynamic Connectivity for Predicting Spectrum-Level Deficits in Autism. In: Martel A.L. et al. (eds) Medical Image Computing and Computer Assisted Intervention – MICCAI 2020. MICCAI 2020. Lecture Notes in Computer Science, vol 12267. Springer, Cham. https://doi.org/10.1007/978-3-030-59728-3\_43.

Case Reports [CR] None.

Book Chapters, Monographs [BC] None.

Books, Textbooks [BK] None.

**FUNDING**

**EXTRAMURAL FUNDING**

**Research Extramural Funding**

Current

5/13/16-4/30/22 n.c.e. Visual Motor Development in Infants at High Risk for Autism

K01 MH109766-01

National Institute of Mental Health

$148,947

Role: P.I. 100% (12.00 calendar)

This study will investigate developmental patterns of behavior and brain function hypothesized to contribute to impaired acquisition of skills necessary for normal motor and social-communicative development in autism. This work is expected to contribute to a more nuanced understanding of the neurodevelopmental pathways that lead to a diagnosis of autism.

2/1/19-11/30/22 Bayesian Methods for Cortical Surface Neuroimaging Data

R01 EB027119

National Institute of Biomedical Imaging and Bioengineering

$83,119

P.I. Amanda [Mejia](https://mandymejia.com/)

Role: Co-Investigator; 15% (1.8 calendar)

This project will develop computationally efficient Bayesian methods for analyzing cortical surface functional magnetic resonance imaging (fMRI) data. Compared with traditional volumetric fMRI, cortical surface fMRI offers superior alignment of subjects’ cortical areas and more meaningful spatial modeling through neurologically relevant geodesic distances along the cortical surface. We will apply the proposed methods to study brain-behavior relationships in autism and amyotrophic lateral sclerosis. ***\*Please note, for the first 3 years, Dr. Nebel’s effort and funding support for this project will be subsumed under her K01.***

9/30/19-3/31/22 n.c.e HEALthy ORCHARD: Developing Plans for a Baltimore Site of the HEALthy BCD Study

R34 DA050292

National Institute of Drug Abuse

$191,453

P.I. M. Daniele Fallin

Role: Co-Investigator; 2.0% (0.24 calendar)

As part of the NIH initiative HEALthy BCD, we propose to create a Baltimore site, named HEALthy ORCHARD, to join in recruiting and following pregnant women with and without substance use disorders and their children including longitudinal assessments of brain function, social, emotional, and cognitive development through age 10. ***\*Please note, Dr. Nebel’s effort and funding support for this project will be subsumed under her K01.***

8/1/20-5/31/25 Sleep and Circadian Dysfunction, Brain and Neurobehavioral Development in Autism

P50HD103538

Eunice Kennedy Shriver National Institute of Child Health and Human Development

$177,959

P.I. Bradley Schlagger

Role: Co-Investigator; 5% (0.60 calendar)

The goal of this project is to examine how disturbed sleep and altered circadian rest/activity rhythms (RARs) affect brain development, cognitive and adaptive function, and symptom severity in children with autism. We propose to refine how sleep/wake problems are assessed in children with autism by applying novel statistical modeling to objective, actigraphy-based measures and parent-report measures and examining how disturbed sleep and altered RARs might affect brain structure and function. This work will help to refine and inform clinical and prevention practices among children with disordered sleep and autism, providing methological advances in sleep characterization and etiology. ***\*Please note, for the first year and the first 8 months of year 2, Dr. Nebel’s effort and funding support for this project will be subsumed under her K01.***

10/1/21-9/30/26 Healthy Brain and Child Development National Consortium

U01DA055350-01

National Institute of Health

$2,150,019

P.I. M. Daniele Fallin, Irina Burd, Joan Kaufmann

Role: Co-Investigator; 40% (4.8 calendar) year 1; 60% (7.2 calendar) years 2-5

Various adverse and protective environments may affect child development. The Healthy Brain and Child Development National Consortium (HBCD-NC) will follow 7,500 mothers and their children across the U.S. from before birth to 10 years of age to better understand which harmful and protective environments exert the greatest impact on child development. This study will help to improve the health and development of children across the nation. ***\*Please note, in the first 7 months of year 1, Dr. Nebel’s effort and funding support for this project will be subsumed under her K01.***

Pending

4/1/22-3/31/27 Dynamic visual motor integration in children with autism: Advancing a promising phenotypic biomarker using computer vision and brain imaging

#875675

Simons Foundation

P.I. Adam Eggebrecht

Role: Co-Investigator; 5% (0.60 calendar)

The goal of this project is to advance a promising phenotypic biomarker of autism spectrum disorder (ASD). Using computer vision-based metrics and high-fidelity brain imaging methods, we will map movement dynamics and brain activation during performance of a highly scalable motor imitation task, which has been established as challenging for children with ASD. This imitation assessment has strong promise for identifying biologically meaningful subtypes of ASD and improving targeted interventions.

4/1/22-3/31/27 Edited Magnetic Spectroscopy in the Pediatric Brain

R01EB032788

National Institute of Mental Health

$219,480

P.I. Richard Edden

Role: KKI Subcontract P.I.; 12% (1.44 calendar)

The goal of this proposal is to develop multi-spectrum edited MRS in the pediatric brain, building acquisition and data processing tools, acquiring key reference data and disseminating the resulting experiments to collaborative partner sites.

7/1/22-6/30/27 Affective and neurocognitive mechanisms underlying antidepressant effects of psilocybin therapy

R01MH130699

National Institute of Mental Health

$3,863,171

P.I. Frederick Barrett

Role: Co-I; 10% (1.2 calendar)

The goal of this double-blind, placebo-controlled, mechanistic study will extend our prior work to determine whether negative affect and cognitive control play a role in enduring psilocybin effects on depression severity in patients with major depressive disorder.

7/1/22-6/30/25 Identifying challenges with learning to drive in ASD

R23 HD13487985

Eunice Kennedy Shriver National Institute of Child Health and Human Development

$227,855

P.I. Jonathon Ehsani

Role: KKI Subcontract PI; 10% (1.2 calendar)

The goal of this proposal is to combine real world driving data collected during the learner’s permit stage with fMRI driving hazard perception data to determine mechanisms impacting autistic adolescents’ ability to drive safely.

7/1/22-6/30/25 Application of novel high-dimensional moderation and mediation computational models to examine neurobehavioral mechanisms of sex differences in adolescent outcomes for children with ADHD

R23 MH

National Institute of Mental Health

$240,855

P.I. Keri Rosch

Role: Co-I; 10% (1.2 calendar)

The goal of this proposal is to use modern, high dimensional mediation models to decompose the impact of sex on longitudinal adolescent outcomes among children with ADHD into direct effects and indirect effects mediated by structural and functional connectivity.

Previous

11/1/12-10/31/14 Understanding the Brain Basis of Impaired Imitation Learning in Autism

#7961

Autism Speaks

Role: P.I.; 100% (12 calendar)

The goal of this project is to compare the influence of visual and proprioceptive input on imitation learning in school-age children with autism and to identify patterns of brain connectivity that are related to autism-associated impairments in imitation.

7/1/15-4/30/16 Adolescent Changes in Brain and Behavior in Boys and Girls with ADHD

2 R01 MH085328-10A1

National Institute of Mental Health

P.I.: Stewart Mostofsky

Role: Research Scientist; 32% (3.84 calendar)

The goal of this project is to examine developmental changes in brain structure and behavior in girls and boys with ADHD and to examine the impact of these changes on adolescent mental health and other functional outcomes. The findings will help identify risk factors in children with ADHD and could thereby lead to prevention efforts and improved outcomes for children with ADHD.

7/1/15-4/30/16 Statistical Methods for Mapping Human Brain Development

R01 MH095836

National Institute of Mental Health

P.I.: Philip [Reiss](https://works.bepress.com/phil_reiss/)

Role: Co-I; 25% (3.00 calendar)

The goal of this project is to develop new statistical methods to compare trajectories of the functional organization of the brain in typically developing children and children with neurodevelopmental disorders, namely autism and attention deficit hyperactivity disorder.

7/1/15-6/30/16 Statistical Methods for Large N and P Problems

R01 EB012547

National Institute of Biomedical Imaging and Bioengineering

P.I.: Brian [Caffo](https://sites.google.com/view/bcaffo/home)

Role: Co-I; 25% (3.00 calendar)

The goal of this project is to tailor model-based independent component blind source separation methods to investigate brain-behavior relationships in large, multi-site fMRI data sets from various patient populations, including autism.

7/1/18-6/30/21 CRCNS Research Proposal: Collaborative Research: Discovering Network Structure in the Space of Group-Level Functional Differences

#1822581

National Science Foundation

$138,916

P.I. Archana [Venkataraman](https://engineering.jhu.edu/nsa/)

Role: Co-Investigator; 4.16% (0.50 calendar)

This project will develop methods to discover and characterize brain network architectures in the space of group-level functional differences. This strategy mimics our growing perception of complex neurological disorders as system-level dysfunctions, rather than a collection of isolated effects. We will strategically leverage patient heterogeneity to guide network estimation in three clinical test beds: autism, ADHD, and schizophrenia. ***\*Please note Dr. Nebel’s effort and funding support for this project was subsumed under her K01***

**Educational Extramural Funding**

Current None

Pending

7/1/22-6/30/25 Psychiatric Epidemiology Training Program

T32MH014592

National Institute of Mental Health

P.I. Heather Volk; Peter Zandi

Role: Affiliated Faculty

Recent scientific advances in omics (e.g., genomics, epigenomics, transcriptomics, proteomics, and metabolomics), informatics (e.g., electronic medical records, mobile technologies, and biosensors) and imaging present new opportunities for accelerating the discovery and translation of findings into public health gains. This training program will capitalize on the unusually rich resources for biomedical research at the Johns Hopkins University to provide trainees with the skills and experiences needed to lead multi-disciplinary research that takes advantage of these emerging opportunities and promotes mental health.

Previous None

**INTRAMURAL FUNDING None**

**CLINICAL ACTIVITIES N/A**

**EDUCATIONAL ACTIVITIES**

Educational Focus

fMRI quality control, preprocessing, and analyses

reproducible research

collaborative science

science communication

My educational focus is on chronic kidney disease and how to treat ….

**Teaching**

**Classroom instruction**

National

2007 (Fall) Co-Instructor, Ethics for Biomedical Graduate Students, UNC Chapel Hill

2011 (Spring) Writing Mentor, Undergraduate, The Science of Staying in Shape, Duke University

2013 (Spring) Writing Mentor, Undergraduate, Current Research in Neuroscience, Duke University

2014 (Fall) Writing Mentor, Undergraduate, Engineering Innovation, Duke University

2015 (Spring) Writing Mentor, Undergraduate, Visual Perception and the Brain, Duke University

2017 (Fall) Guest Lecturer, Undergraduate, Applied Linear Regression, Indiana University

2018 (Fall) Guest Lecturer, Undergraduate, Applied Linear Regression, Indiana University

2019 (Fall) Guest Lecturer, Undergraduate, Applied Linear Regression, Indiana University

2020 (Fall, virtual) Guest Lecturer, Undergraduate, Applied Linear Regression, Indiana University

JHMI/Regional None

International None

**CME instruction**

JHMI/Regional

2016 (Fall) Guest Lecturer for Pediatric Radiology Housestaff, Multidisciplinary Updates in Pediatric Radiology, “Investigating the brain-basis of motor deficits in autism using functional magnetic resonance imaging”, Johns Hopkins University

National None

International None

**Workshops / seminars**

JHMI/Regional

2014 (Fall) Guest Lecturer, Clinical Neurosciences Conference Series, “Visuomotor functional connectivity in autism”, Johns Hopkins University

2015 (Winter) Guest Lecturer for Child and Adolescent Psychiatry Fellows, “Neurobiology of Autism”, Johns Hopkins University

National None

International None

**Mentoring**

Pre-doctoral Advisees / Mentees

Date Mentee name, degree, present position; awards/grants/degrees received under your

direction, indicate shared publications scholarship by numbered entries in this CV

Post-doctoral Advisees / Mentees

Date Mentee name, degree, present position; awards/grants/ degrees received under your

direction, indicate shared publications scholarship by numbered entries in this CV

1995 – 1998 Brian K. Smithson, MD, [chief resident], currently associate professor, Pediatrics, University of Y, city, state. Awarded American Journal of Pediatrics Career Development Award (1997); co-authored articles OR 4, LE 1

Thesis committees None

Educational Program Building / Leadership None

Educational Demonstration Activities to external audience on or off campus None

**Clinical instruction** N/A

**RESEARCH ACTIVITIES**

Research Focus

Sensorimotor development

Autism spectrum disorder

Scanning young populations during natural sleep

fMRI analysis methods

I study how children learn to interpret sensory information to produce appropriate actions using functional magnetic resonance imaging (fMRI) and video-based assessments of behavior. I have helped develop innovative methods for using fMRI data to characterize the brain’s functional organization and have applied these methods to show how atypical communication between visual and motor brain regions contribute to impaired motor and social skill performance in autistic children. My work has increasingly focused on extending these methods to study the emergence of visually guided reaching, which has involved developing the infrastructure at KKI/JHU to scan infants and toddlers during natural sleep. Due to the inherent challenges of scanning young populations, a secondary focus of my research is on analysis methods that make the most of the available data by minimizing artifacts and maximizing the accuracy, reproducibility, and generalizability of fMRI-derived connectivity metrics.

Research Program Building / Leadership

6/15 – present Manager of collaborative fMRI projects in the Center for Neurodevelopmental and Imaging Research, Kennedy Krieger Institute. I am responsible for managing internal and external collaborations involving secondary analyses of fMRI data at the Center for Neurodevelopmental and Imaging Research. I provide guidance for collaborators in the appropriate use of the data given their research goals, and I oversee data preparation and sharing.

9/19 - present Scanning young children during natural sleep

Research Demonstration Activitiesto external audience, on or off campus None

Inventions, Patents, Copyrights None

Technology Transfer Activities None

**SYSTEM INNOVATION AND QUALITY IMPROVEMENT ACTIVITIES** N/A

**ORGANIZATIONAL ACTIVITIES**

Institutional Administrative Appointments

Date Role, Committees, any explanatory notes

2000-2001 Member, Search Committee for Chief of Division of x

2001-2002 Member, Pediatric Residency Curriculum Committee

**Editorial Activities**

Editorial Board appointments

Date Role, Editorial Board name

Journal Peer review activities

Date you first reviewed for them….Journal full name (*do not abbreviate here*); we do not need to know each year that you reviewed a manuscript

1994-present Journal of Adolescent Medicine

1995-present Metabolism

Other peer review activities [non medico-legal]

2017 Abstract reviewer for the annual meeting of the Organization for Human Brain Mapping

Advisory Committees, Review Groups / Study Sections

2021-present Member, Healthy Brain and Child Development National Consortium Scanning Young Populations Working Group

2021-present Member, Healthy Brain and Child Development National Consortium MRI Working Group

Professional Societies

Note, when you include additional duties for the society, move “Member” to its own line; see examples

Date Society

Date Role, committee

1985-1990                    Member, Society for Pediatric Research (SPR)

1993-present                The Endocrine Society (ES)

                                    1993-present    Member (ES)

                                    1995-1996        Treasurer (ES)

                                    1997-2001        Member, Membership Committee (ES)

1993-present                Member, American Pediatric Society (APS)

**Session Chair**

International

5/21 Session chair, International Society for Autism Research, Annual Meeting, virtual

JHMI/regional None

National None

**Conference Organizer** None

**Consultantships** None

**RECOGNITION**

If there is no data to report for this entire section, list “None” or “N/A” to the right of this RECOGNITION section heading and remove the below subheadings within this section. If there *is* data to report, then *all* subheadings must be included. For each subheading, if there is no data to report, list “None” or “N/A”. Subheadings with responses of “None” or “N/A” may be grouped together, single spaced at the end of the section.

Awards, Honors

Date Title, description, sponsor, any explanatory notes

1991 “Pediatric Leaders for the 21st Century,” American Society of Pediatrics

1999 Johns Hopkins Young Investigators Award

2007 Teacher of the Year Award, Class of 2007, Johns Hopkins University School of Medicine

**Invited Talks** Must be sorted into JHMI/Regional, National, International

Such as grand rounds, keynote addresses, visiting professorships. *Do not duplicate entries already shown above.*

If you have several visiting professorships, feel free to separate them into their own subcategory

Date Title, sponsor, venue, any explanatory notes

JHMI/Regional

3/31/05 Speaker, JHU Pediatric Grand Rounds, “Chronic disease in children,” Baltimore, MD

4/4/10 Keynote Speaker, Johns Hopkins Presents, Chronic disease in children,” Rockville, MD

National

International

2/1/14 Speaker, 17th Annual Meeting, International Society of Pediatricians, “Chronic disease in

children,” Geneva, Switzerland

Visiting Professorships

1/15/09 University of Kansas School of Medicine – Kansas City, “Advances in Pediatric Nephrology” 2/1/11 University of Southern California – Los Angeles, “Chronic disease in children”

**OTHER PROFESSIONAL ACCOMPLISHMENTS** (*Optional)*

Posters (optional)

Date, title, sponsor, location, notes

4/4-6/02 **Prefect WA**, Jones SL, Smith TK. “Chronic Disease in Children,” American Society Pediatrics

Annual meeting, Bethesda, MD

Oral/Podium Presentations (optional) [abstracts presented orally and published as part of the meeting program]

Date, title, sponsor, location, publication notes; who gave the presentation if not you

4/4/02 **Prefect WA**, Jones SL, Smith TK. “Chronic Disease in Children.” American Society Pediatrics

Annual meeting, Bethesda, MD; Proc Am Soc Peds. 2002 Annual Mtg. 2002(8);11:144 *[Dr.*

*Smith gave the talk]*

Community Services (optional)

Humanitarian Activities (optional)

Philanthropic Activities (optional)

Other (optional)

**CONGRATULATIONS – GREAT JOB!!!!**

**PRIOR TO SUBMISSION, CHECK THE ABOVE TO:**

* **Remove instructional text shown in red font**
* **Remove sample responses shown in green font**
* **Remove the first page of instructions**

**CVs that do not adhere to the required format will delay the application process**