BIOGRAPHICAL SKETCH

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NAME: Neul, Jeffrey

eRA COMMONS USER NAME (credential, e.g., agency login): jlneul

POSITION TITLE: Director of the Vanderbilt Kennedy Center, Professor of Pediatrics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	START DATE MM/YYYY	END DATE MM/YYYY	FIELD OF STUDY
University of Illinois at Urbana-Champaign, Urbana-Champaign, IL	BS	08/1987	05/1991	Chemistry
University of Chicago, Chicago, IL	PHD	06/1993	06/1998	Developmental Biology
University of Chicago, Chicago, IL	MD	06/1991	06/2000	Medicine
Cold Spring Harbor Laboratory	Other training	1998	1998	Genetic-Epidemiological Studies of Complex Diseases
Baylor College of Medicine, Houston, TX	Resident	06/2000	06/2001	Pediatrics
Baylor College of Medicine, Houston, TX	Resident	07/2001	06/2004	Child Neurology
Baylor College of Medicine, Houston, TX	Postdoctoral Fellow	07/2004	06/2005	Developmental Neurosciences-lab of Huda Zoghbi
Harvard School of Public Health	Other training	2014	2014	Leadership Development for Physicians in Academic Health Centers

A. Personal Statement

I am the Director of the Vanderbilt Kennedy Center (VKC) at Vanderbilt University Medical Center, a center with a 50 plus year history of research, training, service, and advocacy for developmental disabilities. The mission of VKC is to improve the lives of people with developmental disabilities and their families. We approach developmental disabilities very broadly, with approaches ranging from basic biomedical, behavioral, educational, workforce training, community integration, and advocacy for policy change. I personally am a physician scientist interested in understanding the pathophysiology and developing therapies for childhood neurodevelopmental diseases (NDD), specifically for a rare genetic form of NDD, Rett syndrome. For the last decade, I have been involved in an NIH U54 funded natural history study of Rett syndrome, and I have been the PI for clinical trials in Rett syndrome. In addition to the clinical work outlined, I run an NIH funded basic science laboratory, with the goal of using animal and cellular models to understand the pathophysiology of Rett syndrome and to develop and test new therapies in these models. My research has also focused on characterization of new genetic causes of neurodevelopmental disorders and careful phenotyping of these disorders, and I am on the ClinGen Expert Curation Panel for Rett syndrome/Angelman and Related Disorders. This experience provided the expertise needed to contribute to this project.

1. Sajan SA, Jhangiani SN, Muzny DM, Gibbs RA, Lupski JR, Glaze DG, Kaufmann WE, Skinner SA, Annese F, Friez MJ, Lane J, Percy AK, Neul JL. Enrichment of mutations in chromatin regulators in people with Rett syndrome lacking mutations in MECP2. Genet Med. 2017 Jan;19(1):13-19. PubMed PMID: 27171548; PubMed Central PMCID: PMC5107176.
2. Neul JL, Glaze DG, Percy AK, Feyma T, Beisang A, Dinh T, Suter B, Anagnostou E, Snape M, Horrigan J, Jones NE. Improving Treatment Trial Outcomes for Rett Syndrome: The Development of

Rett-specific Anchors for the Clinical Global Impression Scale. J Child Neurol. 2015 Nov;30(13):1743-8. PubMed PMID: 25895911; PubMed Central PMCID: PMC4610825.

3. Neul JL, Kaufmann WE, Glaze DG, Christodoulou J, Clarke AJ, Bahi-Buisson N, Leonard H, Bailey ME, Schanen NC, Zappella M, Renieri A, Huppke P, Percy AK. Rett syndrome: revised diagnostic criteria and nomenclature. Ann Neurol. 2010 Dec;68(6):944-50. PubMed PMID: 21154482; PubMed Central PMCID: PMC3058521.
4. Neul JL, Fang P, Barrish J, Lane J, Caeg EB, Smith EO, Zoghbi H, Percy A, Glaze DG. Specific mutations in methyl-CpG-binding protein 2 confer different severity in Rett syndrome. Neurology. 2008 Apr 15;70(16):1313-21. PubMed PMID: 18337588; PubMed Central PMCID: PMC2677974.

B. Positions and Honors

Positions and Employment

2005 - 2011	Assistant Professor, Baylor College of Medicine, Houston, TX
2008 - 2012	Assistant Medical Director, Blue Bird Circle Rett Center, Baylor College of Medicine, Houston, TX
2008 - 2014	Cynthia and Anthony Petrello Endowed Scholar, Jan and Dan Duncan Neurological Research Institute, Texas Children's Hospital, Houston, TX
2011 - 2014	Associate Professor, Section of Neurology, Department of Pediatrics, Baylor College of Medicine, Houston, TX
2012 - 2014	Medical Co-Director, Blue Bird Circle Rett Center, Baylor College of Medicine, Houston, TX
2014 - 2017	Chief, Division of Child Neurology, Department of Neurosciences, University of California, San Diego, La Jolla, CA
2015 - 2017	Professor and Vice Chair of Developmental Neurosciences, Department of Neurosciences , University of California, San Diego, La Jolla, CA
2017 -	Director, Vanderbilt Kennedy Center, Vanderbilt University Medical Center, Nashville, TN
2017 -	Annette Schaffer Eskind Chair, Professor of Pediatrics, Vanderbilt University Medical Center, Nashville, TN

Other Experience and Professional Memberships

2001 -	Member, Child Neurology Society
2001 -	Member, Americal Academy of Neurology
2007 -	Member, Society of Neuroscience
2007 - 2011	Scientific Selection Committee Member, Child Neurology Society
2008 -	Executive Committee, Rett Search
2009 -	Medical Advisory Board, International Rett Syndrome Foundation
2009 - 2012	Awards Committee Member, Child Neurology Society
2010 -	Grant Reviewer, Food and Drug Administration Orphan Products Development
2011 - 2014	ad hoc reviewer, National Institutes of Health - Molecular Neurogenetics Study Section
2013 -	Member, American Society for Clinical Investigation
2013 -	Research Committee Member, Child Neurology Society
2014 -	Member, American Society for Human Genetics
2014 -	Standing Member, National Institutes of Health - Molecular Neurogenetics Study Section
2014 -	Standing Member, National Institutes of Health - Neurological Sciences Training Study Section

Honors

1990	Illinois General Assembly Scholarship, University of Illinois
1991	Magna Cum Laude, College of Liberal Arts and Sciences, University of Illinois
1991	Graduated with Highest Distinction, School of Chemical Sciences, University of Illinois
1991	Phi Beta Kappa, University of Illinois
1991	Medical Scientist Training Program Fellowship, University of Chicago
1999	Committee Thesis Award for Outstanding Performance in the Field of Developmental Biology,

	University of Chicago
2009	Philip R. Dodge Young Investigator Award, Child Neurology Society
2011	Circle of Angels Award for Outstanding Research In Rett Syndrome, International Rett Syndrome Foundation
2013	Elected as member , American Society for Clinical Investigation

C. Contribution to Science

1. **Clinical evaluation and clinical trials in neurodevelopmental diseases** Dr. Neul has been involved in an NIH-funded Natural History Study on Rett syndrome for over a decade, and is the administrative head and PI for the MECP2 Duplication Syndrome on the most recent award. Dr. Neul is also the PI on foundation and industry sponsored trials of a novel compounds in Rett syndrome. Dr. Neul led the international effort to develop new diagnostic criteria for Rett syndrome, and has done extensive work characterizing various clinical features, genotype-phenotype relationships, and developing disease specific outcome measures suitable of for clinical trials.

    a. Neul JL, Kaufmann WE, Glaze DG, Christodoulou J, Clarke AJ, Bahi-Buisson N, Leonard H, Bailey ME, Schanen NC, Zappella M, Renieri A, Huppke P, Percy AK. Rett syndrome: revised diagnostic criteria and nomenclature. Ann Neurol. 2010 Dec;68(6):944-50. PubMed PMID: 21154482; PubMed Central PMCID: PMC3058521.

    b. Neul JL, Lane JB, Lee HS, Geerts S, Barrish JO, Annese F, Baggett LM, Barnes K, Skinner SA, Motil KJ, Glaze DG, Kaufmann WE, Percy AK. Developmental delay in Rett syndrome: data from the natural history study. J Neurodev Disord. 2014;6(1):20. PubMed PMID: 25071871; PubMed Central PMCID: PMC4112822.

    c. Cuddapah VA, Pillai RB, Shekar KV, Lane JB, Motil KJ, Skinner SA, Tarquinio DC, Glaze DG, McGwin G, Kaufmann WE, Percy AK, Neul JL, Olsen ML. Methyl-CpG-binding protein 2 (MECP2) mutation type is associated with disease severity in Rett syndrome. J Med Genet. 2014 Mar;51(3):152-8. PubMed PMID: 24399845; PubMed Central PMCID: PMC4403764.

    d. Neul JL, Glaze DG, Percy AK, Feyma T, Beisang A, Dinh T, Suter B, Anagnostou E, Snape M, Horrigan J, Jones NE. Improving Treatment Trial Outcomes for Rett Syndrome: The Development of Rett-specific Anchors for the Clinical Global Impression Scale. J Child Neurol. 2015 Nov;30(13):1743-8. PubMed PMID: 25895911; PubMed Central PMCID: PMC4610825.

2. **Genetics of Neurodevelopmental Diseases**. Dr. Neul has been involved in the evaluation of the genotype-phenotype relationship in Rett syndrome and in the discovery of new genetic factors that cause Rett syndrome and Rett-related Neurodevelopmental Disorders. This work demonstrated a clear relationship between specific mutations in *MECP2* and clinical severity. Additionally, Dr. Neul identified that there are exceptional individuals with disease causing mutations in *MECP2* who do not clinically have Rett syndrome, suggesting the existence of genetic modifiers of disease.

    a. Sajan SA, Jhangiani SN, Muzny DM, Gibbs RA, Lupski JR, Glaze DG, Kaufmann WE, Skinner SA, Annese F, Friez MJ, Lane J, Percy AK, Neul JL. Enrichment of mutations in chromatin regulators in people with Rett syndrome lacking mutations in MECP2. Genet Med. 2017 Jan;19(1):13-19. PubMed PMID: 27171548; PubMed Central PMCID: PMC5107176.

    b. Suter B, Treadwell-Deering D, Zoghbi HY, Glaze DG, Neul JL. Brief report: MECP2 mutations in people without Rett syndrome. J Autism Dev Disord. 2014 Mar;44(3):703-11. PubMed PMID: 23921973; PubMed Central PMCID: PMC3880396.

    c. Cuddapah VA, Pillai RB, Shekar KV, Lane JB, Motil KJ, Skinner SA, Tarquinio DC, Glaze DG, McGwin G, Kaufmann WE, Percy AK, Neul JL, Olsen ML. Methyl-CpG-binding protein 2 (MECP2) mutation type is associated with disease severity in Rett syndrome. J Med Genet. 2014 Mar;51(3):152-8. PubMed PMID: 24399845; PubMed Central PMCID: PMC4403764.

    d. Neul JL, Fang P, Barrish J, Lane J, Caeg EB, Smith EO, Zoghbi H, Percy A, Glaze DG. Specific mutations in methyl-CpG-binding protein 2 confer different severity in Rett syndrome. Neurology. 2008 Apr 15;70(16):1313-21. PubMed PMID: 18337588; PubMed Central PMCID: PMC2677974.

3. **Preclinical testing of novel therapeutics in animal models of neurological disease.** The Neul lab has focused attention on the development and implementation of rigorous pre-clinical testing of potential therapies in mouse models of neurological diseases, especially those involving alteration in MeCP2 function. Dr. Neul was a major participant in an NIH-sponsored workshop focused on identifying issues involved in pre-clinical testing in mouse models of Rett syndrome, leading to an important paper outlining issues and describing best practices in conducting pre-clinical research in these disorders. The Neul lab has successfully implemented these methods in a series of papers exploring various treatment options in mouse models of Rett syndrome.

    a. Wang J, Wegener JE, Huang TW, Sripathy S, De Jesus-Cortes H, Xu P, Tran S, Knobbe W, Leko V, Britt J, Starwalt R, McDaniel L, Ward CS, Parra D, Newcomb B, Lao U, Nourigat C, Flowers DA, Cullen S, Jorstad NL, Yang Y, Glaskova L, Vigneau S, Kozlitina J, Yetman MJ, Jankowsky JL, Reichardt SD, Reichardt HM, Gärtner J, Bartolomei MS, Fang M, Loeb K, Keene CD, Bernstein I, Goodell M, Brat DJ, Huppke P, Neul JL, Bedalov A, Pieper AA. Corrigendum: Wild-type microglia do not reverse pathology in mouse models of Rett syndrome. Nature. 2015 Sep 24;525(7570):552. PubMed PMID: 26176914.
    b. Wang J, Wegener JE, Huang TW, Sripathy S, De Jesus-Cortes H, Xu P, Tran S, Knobbe W, Leko V, Britt J, Starwalt R, McDaniel L, Ward CS, Parra D, Newcomb B, Lao U, Nourigat C, Flowers DA, Cullen S, Jorstad NL, Yang Y, Glaskova L, Vingeau S, Kozlitina J, Yetman MJ, Jankowsky JL, Reichardt SD, Reichardt HM, Gärtner J, Bartolomei MS, Fang M, Loeb K, Keene CD, Bernstein I, Goodell M, Brat DJ, Huppke P, Neul JL, Bedalov A, Pieper AA. Wild-type microglia do not reverse pathology in mouse models of Rett syndrome. Nature. 2015 May 21;521(7552):E1-4. PubMed PMID: 25993969; PubMed Central PMCID: PMC4684952.
    c. Pitcher MR, Herrera JA, Buffington SA, Kochukov MY, Merritt JK, Fisher AR, Schanen NC, Costa-Mattioli M, Neul JL. Rett syndrome like phenotypes in the R255X Mecp2 mutant mouse are rescued by MECP2 transgene. Hum Mol Genet. 2015 May 1;24(9):2662-72. PubMed PMID: 25634563; PubMed Central PMCID: PMC4383870.
    d. Herrera JA, Ward CS, Pitcher MR, Percy AK, Skinner S, Kaufmann WE, Glaze DG, Wehrens XH, Neul JL. Treatment of cardiac arrhythmias in a mouse model of Rett syndrome with Na+-channel-blocking antiepileptic drugs. Dis Model Mech. 2015 Apr;8(4):363-71. PubMed PMID: 25713300; PubMed Central PMCID: PMC4381335.

4. **Systematic clinical phenotyping of neurodevelopmental disorders** Through the Rett Syndrome Natural History Study, Dr. Neul has performed a wide array of systematic clinical phenotyping of Rett syndrome. This work provides the framework upon which current clinical trials in Rett syndrome is based.

    a. Killian JT Jr, Lane JB, Lee HS, Pelham JH, Skinner SA, Kaufmann WE, Glaze DG, Neul JL, Percy AK. Caretaker Quality of Life in Rett Syndrome: Disorder Features and Psychological Predictors. Pediatr Neurol. 2016 May;58:67-74. PubMed PMID: 26995066; PubMed Central PMCID: PMC4899118.
    b. Tarquinio DC, Hou W, Neul JL, Kaufmann WE, Glaze DG, Motil KJ, Skinner SA, Lee HS, Percy AK. The Changing Face of Survival in Rett Syndrome and MECP2-Related Disorders. Pediatr Neurol. 2015 Nov;53(5):402-11. PubMed PMID: 26278631; PubMed Central PMCID: PMC4609589.
    c. Motil KJ, Barrish JO, Neul JL, Glaze DG. Low bone mineral mass is associated with decreased bone formation and diet in girls with Rett syndrome. J Pediatr Gastroenterol Nutr. 2014 Sep;59(3):386-92. PubMed PMID: 25144778; PubMed Central PMCID: PMC4144049.
    d. Neul JL, Lane JB, Lee HS, Geerts S, Barrish JO, Annese F, Baggett LM, Barnes K, Skinner SA, Motil KJ, Glaze DG, Kaufmann WE, Percy AK. Developmental delay in Rett syndrome: data from the natural history study. J Neurodev Disord. 2014;6(1):20. PubMed PMID: 25071871; PubMed Central PMCID: PMC4112822.

Complete List of Published Work in My Bibliography:
https://www.ncbi.nlm.nih.gov/myncbi/jeffrey.neul.1/bibliography/41746065/public/

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

2 U5461222-11, NIH/NICHD
Percy (PI)
09/17/14-07/31/19
Rett syndrome, MECP2 Duplication, and Rett-related Natural History for the ORDR Rare Disease Clinical Research Consortia (RDCRC) for Rare Disease Clinical Disease Network
The goal of this project is to understand the natural history of Rett syndrome, MECP2 Duplication, and Rett-related disorders and develop meaningful biomarkers and outcome measurements for clinical trials.
Role: Co-Investigator
Overlap: None

R01HD083181, NIH/NICHD
Neul, Jeffrey (PI)
09/01/16-06/30/21
NEUROBEHAVIORAL AND BIOCHEMICAL OUTCOME MEASURES IN RETT SYNDROME RODENT MODELS
Role: PI (MPI mechanism)
Overlap: None

Completed Research Support

U54 HD083092-01
ZOGHBI, HUDA Y (PI)
09/23/14-06/30/19
Baylor Intellectual and Developmental Disabilities Research Centers
Role: PI (Grant continues after Neul left Baylor)

R21 NS089366-02
Neul, Jeffrey L (PI)
02/01/15-01/31/17
The nature of astrocyte heterogeneity in RTT
Role: PI

R01 HD062553
Neul, Jeffrey L (PI)
07/01/10-05/31/17
Characterizing autonomic dysfunction in Rett syndrome and other MECP2 disorders
Role: PI