

BIOGRAPHICAL SKETCH

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NAME: **Ruth, Natasha McKerran**

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

POSITION TITLE: Associate 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)	Completion Date MM/YYYY	FIELD OF STUDY
Davidson College, Davidson, NC	B.A.	06/1994	Psychology
University of South Carolina, Columbia, SC	B. S.	06/1995	Biology
University of South Carolina, School of Medicine, Columbia, SC	M.D.	06/2000	Medicine
University of Cincinnati, Cincinnati, OH	M.S.	06/2006	Epidemiology and Biostatistics

A. Personal Statement

I am a pediatric rheumatologist and work as both a clinician and a scientist. I became a faculty member in the department of pediatrics at the Medical University of South Carolina in Charleston, SC in August of 2006 where I began the division of pediatric rheumatology. I was the first board certified pediatric rheumatologist in the state of South Carolina. Two years after starting the division, I successfully recruited one of my mentors from Cincinnati Children's Hospital, Dr. Murray Passo. This allowed me to devote the majority of the next three years to research looking at neuropsychiatric manifestations of pediatric lupus under the mentorship of Dr. Gary Gilkeson. I was part of the BIRCWH-K12 program (Building Interdisciplinary Research in Women's Health) looking at neurocognitive dysfunction in pediatric SLE where I studied the relationship between elevations in NMDA receptor antibodies and poor neurocognitive function. During this time, I traveled to Sierra Leone, West Africa with Dr. Gikeson to study the genetic and environmental factors important in the development of systemic lupus.

Currently, I am the Director of the Division of Pediatric Rheumatology at MUSC as well the Program Director for the pediatric rheumatology fellowship program. My research interest is in childhood-onset SLE, specifically lupus nephritis. I am the co-leader of the SLE: Nephritis group in CARRA (Childhood Arthritis Rheumatology Research Alliance) and was instrumental in starting CARRA's collaboration with the Mid-West Pediatric Nephrology Consortium. I am involved in collaborative research through CARRA where I am a site PI for the CARRA registry, and I participate in multi-centered research in JIA and Lupus. Our division at MUSC is also a member of PR-COIN, our national quality improvement network. My current research interest is in improving care delivery systems for pediatric patients with lupus.

B. Positions and Honors**Positions and Employment**

2000-2003 Resident in Pediatrics, Palmetto Health Richland Hospital, Columbia, SC

2003-2006 Fellow, Pediatric Rheumatology, Cincinnati Children's Hospital, Cincinnati, OH

2006-2008 Director, Pediatric Rheumatology Division, MUSC, Charleston, SC

2006-2013 Assistant Professor, Pediatric Rheumatology, MUSC, Charleston, SC
2006-2012 Assistant Professor, Pediatric Rheumatology, USC, Columbia, SC
2013- Associate Professor, Pediatric Rheumatology, MUSC, Charleston, SC
2014- Division Director, Pediatric Rheumatology, MUSC, Charleston, SC
2016- Fellowship Program Director, Pediatric Rheumatology, MUSC, Charleston, SC

Other Experience and Professional Memberships

2003- American College of Rheumatology
2000- American Academy of Pediatrics, Fellow
2000-2011 American Medical Association, Member
2006- Childhood Arthritis Rheumatology Research Alliance
2006- Pediatric Rheumatology Collaborative Study Group (PRCSG)

Invited Journal Reviewer: Arthritis Care and Research, Journal of Rheumatology, Lupus

Honors

2001 Annual Intern Student Teaching Award, Palmetto Health Richland Memorial Hospital
March-April 2001 Resident Teaching Award, Palmetto Health Richland Memorial Hospital
March-April 2002 Resident Teaching Award, Palmetto Health Richland Memorial Hospital
2003 Developmental Pediatrics Award, Palmetto Health Richland Memorial Hospital
2001 Annual Intern Student Teaching Award, Palmetto Health Richland Memorial Hospital
March-April 2001 Resident Teaching Award, Palmetto Health Richland Memorial Hospital
March-April 2002 Resident Teaching Award, Palmetto Health Richland Memorial Hospital
2008 Subspecialty Annual Teaching Award, Department of Pediatrics, MUSC
2009 Mentor of the Year Award, Department of Pediatrics, MUSC
2010 Faculty Excellence Award Nominee, MUSC, College of Medicine
2010 Elite Educator Assembly, Recognized by Pediatric Residents as a Master Educator, Department of Pediatrics, MUSC
2010 Outstanding Elective Rotation, Clinical Education Coordinator for Pediatric Residents, Recognized by the Department of Pediatrics, MUSC
2010 Distinguished Young Alumni Award, University of South Carolina School of Medicine, Columbia, SC
2011 Physician of the Month, MUSC
2014-2015 MUSC Faculty Excellence Educator of the Block Award, MUSC
2015 Castle Connolly Top Doctors
2016 Castle Connolly Top Doctors
2016 Outstanding Elective Rotation, Clinical Education Coordinator for Pediatric Residents, Recognized by the Department of Pediatrics, MUSC
2017 Outstanding Elective Rotation, Clinical Education Coordinator for Pediatric Residents, Recognized by the Department of Pediatrics, MUSC
2017 Castle Connolly Top Doctors
2017 Castle Connolly Exceptional Women in Medicine
2018 Castle Connolly Top Doctors

C. Contributions to Science

1. Many of my publications center around pediatric systemic lupus erythematosus. My early publications addressed the utilization of formal neurocognitive testing as well as a new automated technique, the Pediatric ANAM, in assessing neuropsychiatric lupus in children. My interest in lupus then extended to include more recent publications in lupus nephritis. In my role as the Division Director of pediatric rheumatology at MUSC, this interest has become more enhanced as I work in close collaboration with my adult colleagues in lupus research. I have spent time traveling with one of my mentors, Dr. Gary Gilkeson, to Sierra Leon, West Africa where we collected samples in order to better elucidate the genetic and environmental contributions involved in the development of lupus. In my role as the co-leader for the CARRA SLE: Nephritis group, I promoted further research in pediatric lupus nephritis and was part of the research team that published the CTP guidelines for proliferative lupus nephritis. My recent publications looked at practice patterns in approach to kidney biopsies.

This was the first publication that included a collaborative effort with pediatric nephrologists and rheumatologists. I also worked with colleagues in Toronto at Sick Kids in the development of a smart phone tool for patients with lupus.

- a) Brunner HI, Ruth NM, German A, Nelson S, Passo MH, Roebuck-Spencer T, Ying J, Ris D. Initial validation of the Pediatric Automated Neuropsychological Assessment Metrics for childhood-onset systemic lupus erythematosus. *Arthritis Rheum.* 2007 Oct 15;57(7):1174-82. PubMed PMID: 17907235.
- b) Mina R, von Scheven E, Ardoin SP, Eberhard BA, Punaro M, Ilowite N, Hsu J, Klein-Gitelman M, Moorthy LN, Muscal E, Radhakrishna SM, Wagner-Weiner L, Adams M, Blier P, Buckley L, Chalom E, Chédeville G, Eichenfield A, Fish N, Henrickson M, Hersh AO, Hollister R, Jones O, Jung L, Levy D, Lopez-Benitez J, McCurdy D, Miettunen PM, Quintero-del Rio AI, Rothman D, Rullo O, Ruth N, Schanberg LE, Silverman E, Singer NG, Soep J, Syed R, Vogler LB, Yalcindag A, Yildirim-Toruner C, Wallace CA, Brunner HI; Carra SLE Subcommittee. Consensus treatment plans for induction therapy of newly diagnosed proliferative lupus nephritis in juvenile systemic lupus erythematosus. *Arthritis Care Res (Hoboken).* 2012 Mar;64(3):375-83. doi: 10.1002/acr.21558. PubMed PMID: 22162255; PubMed Central PMCID: PMC3457803.
- c) Vega-Fernandez P, Vanderburgh S, Ruth NM, Levy DM, Zelko FA, Muscal E, Klein-Gitelman MS, Huber A, Wiley K, Thomas EC, Tucker LB, Roebuck-Spencer T, Ying J, Brunner H. A33: cognitive performance scores for the pediatric automated neuropsychological assessment metrics in childhood-onset systemic lupus erythematosus. *Arthritis Rheumatol.* 2014 Mar;66 Suppl 11:S51-2. doi: 10.1002/art.38449. PubMed PMID: 24677962.
- d) Herschman J, Kasenberg T, Levy D, Ruth N, Taberner C, Kaufman M. Development of a smartphone app for adolescents with lupus: a collaborative meeting-based methodology inclusive of a wide range of stakeholders. *Rev Panam Salud Publica.* 2014;35(5/6):467-72
- e) Wenderfer SE, Lane JC, Shatat IF, von Scheven E, Ruth NM. Practice patterns and approach to kidney biopsy in lupus: a collaboration of the Midwest Pediatric Nephrology Consortium and the Childhood Arthritis and Rheumatology Research Alliance. *Pediatr Rheumatol Online J.* 2015 Jun 19;13:26.

2. Additionally, I have worked as collaborator in multiple research projects through CARRA, our national research network. Diseases studied included drug trials in systemic JIA looking at the role of riloncept as well as the development of an algorithm for corticosteroid management in systemic JIA. I also had an early publication in drug safety.

- a) Ilowite NT, Sandborg CI, Feldman BM, Grom A, Schanberg LE, Giannini EH, Wallace CA, Schneider R, Kenney K, Gottlieb B, Hashkes PJ, Imundo L, Kimura Y, Lang B, Miller M, Milojevic D, O'Neil KM, Punaro M, Ruth N, Singer NG, Vehe RK, Verbsky J, Woodward A, Zemel L. Algorithm development for corticosteroid management in systemic juvenile idiopathic arthritis trial using consensus methodology. *Pediatr Rheumatol Online J.* 2012 Aug 29;10(1):31. doi: 10.1186/1546-0096-10-31. PubMed PMID: 22931206; PubMed Central PMCID: PMC3520770.
- b) Kimura Y, Weiss JE, Haroldson KL, Lee T, Punaro M, Oliveira S, Rabinovich E, Riebschleger M, Antón J, Blier PR, Gerloni V, Hazen MM, Kessler E, Onel K, Passo MH, Rennebohm RM, Wallace CA, Woo P, Wulffraat N; Childhood Arthritis Rheumatology Research Alliance Carra Net Investigators. Pulmonary hypertension and other potentially fatal pulmonary complications in systemic juvenile idiopathic arthritis. *Arthritis Care Res (Hoboken).* 2013 May;65(5):745-52. doi: 10.1002/acr.21889. PubMed PMID: 23139240.
- c) Ringold S, Beukelman T, Nigrovic PA, Kimura Y; CARRA Registry Site Principal Investigators. Race, ethnicity, and disease outcomes in juvenile idiopathic arthritis: a cross-sectional analysis of the Childhood Arthritis and Rheumatology Research Alliance (CARRA) Registry. *J Rheumatol.* 2013 Jun;40(6):936-42. doi: 10.3899/jrheum.121147. Epub 2013 Apr 15. PubMed PMID: 23588937.
- d) Ilowite NT, Prather K, Likhnygina Y, Schanberg LE, Elder M, Milojevic D, Verbsky JW, Spalding SJ, Kimura Y, Imundo LF, Punaro MG, Sherry DD, Tarvin SE, Zemel LS, Birmingham JD, Gottlieb BS, Miller ML, O'Neil K, Ruth NM, Wallace CA, Singer NG, Sandborg CI. Randomized, double-blind, placebo-controlled trial of the efficacy and safety of riloncept in the treatment of systemic juvenile idiopathic arthritis. *Arthritis Rheumatol.* 2014 Sep;66(9):2570-9. doi: 10.1002/art.38699. PubMed PMID: 24839206.

- e) Ringold S, Hendrickson A, Abramson L, Beukelman T, Blier PR, Bohnsack J, Chalom EC, Gewanter HL, Gottlieb B, Hollister R, Hsu J, Hudgins A, Ilowite NT, Klein-Gitelman M, Lindsley C, Lopez Benitez JM, Lovell DJ, Mason T, Milojevic D, Moorthy LN, Nanda K, Onel K, Prahald S, Rabinovich CE, Ray L, Rouster-Stevens K, Ruth N, Shishov M, Spalding S, Syed R, Stoll M, Vehe RK, Weiss JE, White AJ, Wallace CA, Sobel RE. Novel method to collect medication adverse events in juvenile arthritis: results from the childhood arthritis and rheumatology research alliance enhanced drug safety surveillance project. *Arthritis Care Res (Hoboken)*. 2015 Apr;67(4):529-37.
- f) HLA-DRB*11 and variants of the MHC class II locus are strong risk factors for systemic Juvenile idiopathic arthritis, Ombrello MJ, Remmers EF, Tachmazidou I, Grom A, Foell D, Haas JP, Martini A, Gattorno M, Ozen S, Prahald S, Zeff AS, Bohnsack JF, Mellins ED, Ilowite NT, Russo R, Len C, Hilarior MO, Oliveira S, Yeung RS, Rosenberg A, Wedderburn LR, Anton J, Schwarz T, Hinks A, Bilginer Y, Park J, Cobb J, Satorius CL, Han B, Baskin E, Signa S, Duerr RH, Achkar JP, Kamboh MI, Kaufman KM, Kottyan LC, Pinto D, Scherer SW, Alarcon-Riquelme ME, Docampo E, Estivill X, Gus A; British Society of Pediatric and Adolescent Rheumatology (BSPAR) Study Group; Childhood Arthritis Prospective Study (CAPS) Group; Randomized Placebo Phase Study of Riloncept in sJIA (RAPPORT) Investigators; Sparks-Childhood Arthritis Response Medication Study (CHARMS) Group; Biologically Based Predictors in JIA (BBOP) Group, de Bakker PI, Raychaudhuri S, Langefeld CD, Thompson S, Zeggini E, Thomson W, Kastner KL, Woo P; International Childhood Arthritis Genetics (INCHARGE) Consortium. *Proc Natl Acad Sci U S A*. 2015 Dec 29;112(52):15970-5.
- g) Race, Income and Disease Outcomes in Juvenile Dermatomyositis, Phillippi K, Hoeltzel M, Byun Robinson A, Kim S; Childhood Arthritis and Rheumatology Research Alliance (CARRA) Legacy Registry Investigators. *J Pediatr*. 2017 May;184:38-44.e1.
- h) The new Childhood Arthritis and Rheumatology Research Alliance (CARRA) registry: design, rationale, and characteristics of patients enrolled in the first 12 months, Beukelman T, Kimura Y, Ilowite NT, Mieszkalski K, Natter MD, Burrell G, Best B, Jones J, Schanberg LE; CARRA Registry Investigators. *Pediatr Rheumatol Online J*. 2017 Apr 17;15(1):30.

3. As a clinician, I have also published editorials, case reports, series, textbook chapters and review articles.

Book Chapters

- a) Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients and the Field Guide for Neonatal and Pediatric Transport, Rheumatologic Emergencies, in press.
- b) Glomerulonephritis, edited by Jonathan J. Hogan, Leal Herlitz and Edgar V Lerma, Lupus Nephritis/Anti-phospholipid Syndrome, in press.

Editorials

- a) Ruth, Natasha M., Gilkeson Gary S. A Sobering Reality in Sierra Leone, *The Rheumatologist*. 2010 March; 4(3): 1
- b) Gilkeson G, James J, Kamen D, Knackstedt T, Maggi D, Meyer A, Ruth N. The United States to Africa lupus prevalence gradient revisited. *Lupus*. 2011Oct;20(10):1095-103. doi: 10.1177/0961203311404915. PubMed PMID: 21917913; PubMedCentral PMCID: PMC3535487.

Case Reports and Case Series

- a) Rebecca C. Brady, MD; Natasha M. Ruth, MD; Eugene A. Minevich, MD; Neil D. Johnson, MBBS; MD; Murray H. Passo, MD, Severe Back and Pelvic Pain in a 14-Year-Old Boy, *Infectious Diseases in Clinical Practice*, Volume 21, Number 6, November 2013
- b) Childhood-Onset Systemic Lupus Erythematosus Complicated by Posterior Reversible Encephalopathy Syndrome in The Context of Kidney Dialysis and Plasma Exchange in Pediatric Lupus. Natasha M. Ruth, Timothy Amrhein, Murray Passo, Gary Gilkeson, *J Pediatr Neurol* 2016; 14(03): 105-109
- c) Frosted Branch Angiitis in Methimazole-Induced Anti-Neutrophil Cytoplasmic Antibody-Positive Vasculitis. Koike KJ, Blice JP, Kylstra JA, Ralston JS, Self SE, Ruth NM, Del Priore LV. *Retin Cases Brief Rep*. 2016 Oct 5.

Review Papers

- a) Lovell DJ, Ruth NM. Pediatric clinical research. *Curr Opin Rheumatol*. 2005 May;17(3):265-70. Review. PubMed PMID: 15838234.
- b) Ruth NM, Passo MH. Juvenile idiopathic arthritis: management and therapeutic options. *Ther Adv Musculoskelet Dis*. 2012 Apr;4(2):99-110. doi: 10.1177/1759720X11413630. PubMed PMID: 22870498; PubMed Central PMCID: PMC3383518.

- c) Advances in the Care of Children with Lupus Nephritis. Wenderfer SE, Ruth NM, Brunner HI. *Pediatr Res*. 2016 Nov 17.

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

Ongoing Research Support

CARRAnet: CARRA Registry
Role on Project: Site Principal Investigator 2010-present
NCT02418442

Completed Research Support

Randomized Placebo Phase Study of Riloncept 2008-2012
in the Treatment of Systemic Juvenile Idiopathic Arthritis
(RAPPORT)
Role on Project: Site Principal Investigator
NIH (NIAMS) N01-AR-7-0015 (PI-Norm Ilowite, MD)

CARRA Enhanced Drug Safety Surveillance Project in JIA 2008-2012
Role on Project: Site Principal Investigator
Pfizer

SINCERE: JIA Registry Study 2009-2011
Role on Project: Site Principal Investigator
Pfizer

NIH Loan Repayment Program (LRP) 2004-2006
Childhood Onset Lupus: Neurocognitive Function
Role on Project: Principal Investigator

Pediatric Rheumatology NIH/NIAMS T32 Training Grant, 2003-2004
Cincinnati Children's Hospital, AR07594-11

Medical University of South Carolina (BIRCWH) 2010-2013
Building Interdisciplinary Careers in Women's Health
Faculty Career Development K12 Program
Mental Health/Addiction or Aging/Cognitive Decline
Role on Project: Principal Investigator
"The association of anti-NMDA receptor antibodies and Neurocognitive
Dysfunction in pediatric patients with lupus and in the offspring of adult
patients with Lupus"

MyLupusApp 2012-2015
Role on Project: Site Principal Investigator
Collaboration between Sick Kids in Toronto, Canada and
MUSC, Charleston, SC, USA
The Lupus Foundation

Pediatric ANAM: Multicenter 2012-2015
Role on Project: Site Principal Investigator
Unfunded