

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

July 20, 2023

I. EDUCATIONAL AND PROFESSIONAL HISTORY

A. Institutions Attended

University of Iowa College of Pharmacy, Iowa City, Iowa
1990-1995
Pharmacy, B.S. with Highest Distinction, 1995

University of Iowa Carver College of Medicine, Iowa City, Iowa
1995-1999
Medicine, M.D., 1999

Postgraduate Medical Education

University of Iowa Children's Hospital, Iowa City, Iowa
1999-2002
Pediatric Residency

University of Iowa Children's Hospital, Iowa City, Iowa
2002-2005
Neonatology Fellowship

Licensure/Certification

Iowa Medical License	exp. 2025	36165
Neonatal-Perinatal Medicine	exp. 2027	4350

B. Professional and Academic Positions

Associate in Pediatrics
University of Iowa Carver College of Medicine
2005-2006

Assistant Professor of Pediatrics
University of Iowa Carver College of Medicine
2006-2011

Associate Professor of Pediatrics (with tenure)
University of Iowa Carver College of Medicine
2011-2018

Director, Physician Scientist Training Pathway (PSTP)
University of Iowa Department of Pediatrics
2013-2015

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

Director, Neonatal Outreach, Division of Neonatology
University of Iowa Department of Pediatrics
2014-2016

Director, Iowa Medical Student Research Program (IMSRP)
University of Iowa Carver College of Medicine
2014 -present

Professor of Pediatrics (with tenure)
University of Iowa Carver College of Medicine
2018 -present

C. Honors, Awards, Recognitions, Outstanding Achievements

- 1991 Phi Eta Sigma Freshman Honor Society, University of Iowa
- 1994 Omicron Delta Kappa Honor Society, University of Iowa
- 1996 Iowa Medical Student Summer Research Fellowship
- 1998 Alpha Omega Alpha, University of Iowa
- 2002 Teacher of the Year in Pediatrics Residency Class
- 2003 NIH Pediatric Research Loan Repayment Program (LRP) Award
- 2003 NIH Young Investigator Travel Award
- 2005 NIH Pediatric Research LRP Competitive Renewal
- 2005 Postdoctoral Fellow Research Award, Carver College of Medicine Research Week, University of Iowa
- 2006 Pediatric Academic Societies' Young Investigator's Travel Award
- 2007 François M. Abboud Cardiovascular Research Center, member
- 2007 NIH Pediatric Research LRP Second Competitive Renewal
- 2008 Fraternal Order of Eagles Diabetes Research Center, member
- 2011 Obesity Research and Education Initiative, member
- 2015 PAS Annual Meeting, Moderator, Fetal Origins of Adult Disease
- 2017 PAS Annual Meeting, Moderator, Neonatal Cardiac Physiology
- 2022 Medical Students with Disabilities and Chronic Illnesses, University of Iowa, mentor
- 2023 Institute for Healthcare Improvement, Pursuing Equity Learning Network, team leader for Stead Family Department of Pediatrics

II. TEACHING

A. Teaching assignments

- 2005–2012 Case-Based, Interactive Lecture during Pediatric Resident Core Curriculum Series
 - 2005 and 2006: Neonatal Procedures
 - 2007, 2008, 2009: Evaluation of the Ill Newborn
 - 2010, 2016: Fluid & Electrolyte Management in Neonatology
 - 2011, 2012: Research During Residency and Beyond
- 2005 – Clinical teaching of residents, students and nurses/neonatal

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

nurse practitioners in the Special Care Nurseries – 10 wk / yr

- 2008–2010 Facilitator, Case Based Learning I, Carver College of Medicine – fall semester
- 2010–2011 Facilitator, Case Based Learning II, Carver College of Medicine – spring semester
- 2015 – **Lead Instructor and Small Group Facilitator**, “Medical Student Responsible Conduct of Research”, 8 hour summer lecture series with didactic and case-based sessions each year; annual presentations on Mentorship and Misconduct
- 2015 – **Course Director and Primary Instructor, Med:8005:0600**, “Medical Student Research Fellowships”, facilitates summer as well as year-long medical student research opportunities
- 2015 – **Originator and Lead Instructor, Med:8074:0600**, “Research Skills Seminar”, 1 credit hour fall elective course for medical students, annual enrolment > 30 students
- 2022 – **Originator and Lead Instructor**, “Methods for Enhancing Reproducibility”, interactive 10-hour summer series with faculty-led seminars and faculty-guided journal clubs for summer medical students

B. Students supervised (for longer than a one month elective)

Post-Doctoral Residents and Fellows

- 2007 – 2010 **Gwen Erkonen**, Pediatric Critical Care
Grants Received
2008-2010: Children’s Miracle Network Trainee Grant
Awards Received
2008: Pediatric Academic Societies’ Travel Award
2010: Pediatric Academic Societies’ Travel Award
Current Position
Attending Physician, Pediatric Advanced Care Team,
Nicklaus Children's Hospital
- 2008 – **Sarah Haskell**, Pediatric Critical Care
Grants Received
2009-2011: T32 HL007121 (PI: Abboud)
2010-2011: Children’s Miracle Network Trainee Grant
2011-2015: K12 HD027748 (PI: Hirsch)
2018-2021: K08 HL141528

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

2020-2025: R01 HL146363

Awards Received

2010: Richard D. Rowe Award, Society for Pediatric Research for outstanding cardiovascular presentation

2011: Pediatric Academic Societies' Travel Award

Current Position

Associate Professor, University of Iowa

Division Director, Pediatric Critical Care

President, Midwest Society of Pediatric Research

2010 – 2011 **Gary Kummet**, Neonatology

Grants Received

2011-2012: T32 HL007121 (PI: Abboud)

Current Position

Neonatologist, Mercy Medical Center, Des Moines, IA

2011 – 2014 **Lauritz Meyer**, Neonatology

Grants Received

2013-2014: Children's Miracle Network Trainee Grant

Awards Received

2013: Mead Johnson Perinatal and Developmental Medicine Travel Award

2013: Metcoff Award, Midwest Society for Pediatric Research for outstanding presentation by a fellow

Current Position

Neonatologist, Sanford Health, Sioux Falls, SD

2012 – 2013 **Suneeti Gupta**, Pediatrics

Current Position

Neonatologist, Athens, GA

2011 – 2013 **Ugochi Ugo**, Pediatrics

Current Position

Assistant Professor, University of Tennessee

2015 – 2018 **Baiba Steinbrekera**, Neonatology

Grants Received

2017-2018: Children's Miracle Network Trainee Grant

Awards Received

2017: Stead Family Department of Pediatrics Clinical Research Award

Current Position

Assistant Professor, Univ of SD, Sioux Falls, SD

2018 – 2022 **Trassanee Chatmethakul**, Neonatology

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

Current Position
Neonatology Fellow, University of Iowa

Medical Students

2010 – 2012 **Ben Dexter**, Carver College of Medicine

Grants Received

2010: CCOM Summer Research Stipend

2011: CCOM Summer Research Stipend

Awards Received

2011: Melvin Marcus Clinical Research Award

Current Position

Pediatrician, Mankato, MN

2011 - 2013 **Holly Engelstad**, Carver College of Medicine

Awards Received

2012: Pediatrics Research Day Best Abstract Award

Current Position

Assistant Professor, Vanderbilt University

2014 **Kate Pitz**, Carver College of Medicine

Grants Received

2014: CCOM Summer Research Stipend

Current Position

OB/Gyn Resident, University of Missouri

2014 **Olivia Rice**, Carver College of Medicine

Grants Received

2014: CCOM Summer Research Stipend

Current Position

Orthopaedics Resident, Carolinas Medical Center

2015 **Madeline Knott**, Carver College of Medicine

Grants Received

2015: CCOM Summer Research Stipend

Honors Received

Graduation with Research Distinction

Current Position

Family Physician, Soddy-Daisy, TN

2015 **Payton Strawser**, Carver College of Medicine

Grants Received

2015: CCOM Summer Research Stipend

Current Position

Orthopaedic Surgery Resident, UNLV

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

Graduate Student

2017 – 2021 **Réka Anna Vass**, Clinical Medical Sciences, Univ of Pécs
Research towards PhD conducted while a Visiting
Scholar at the University of Iowa

Grants Received

2019: New National Excellence Scholarship

2019: János László Doctoral Scholarship

Current Position

Ob/Gyn Resident, University of Pécs, Hungary

Undergraduate Students

2006 – 2008 **Lindsay Dallas**, University of Iowa, Biomedical Engineering

Grants Received

2008: Strong Children's Research Center Summer
Fellowship, University of Rochester, Rochester, NY

Current Position

Pediatrician, Blank Children's Hospital, Des Moines

2008 – 2011 **Gregory Hermann**, University of Iowa, Public Health

Current Position

Radiation-Oncologist, OSF HealthCare

2010 – 2012 **Catherine Zhang**, University of Iowa, Integrative Physiology

Grants Received

2010: American Heart Association Midwest Affiliate,
Undergraduate Student Research Fellowship

Current Position

Gyn-Onc Fellow, University of Wisconsin

2010 – 2014 **Charles Ni**, University of Iowa, Pharmacy

Grants Received

2010: ARRA Supplement, NIH Summer Research
Opportunities for High School and Undergraduate
Students (K08 HD050359-04S1; PI: Roghair)

Current Position

Clinical Pharmacist, Heme/Onc, University of Iowa

2009 – 2015 **Vivian Zhou**, Washington University, Neurosciences

Grants Received

2010: ARRA Supplement, NIH Summer Research
Opportunities for High School and Undergraduate
Students (K08 HD050359-04S1; PI: Roghair)

2013: American Heart Association Midwest Affiliate,
Undergraduate Student Research Fellowship

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COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

Otolaryngology Resident, University of Iowa

- 2011– 2013 **Alise Miller**, Luther College, Biology
Current Position
Principal Financial Group, Des Moines, Iowa
- 2012– 2014 **Kaisen Yao**, Washington University, Biology
Grants Received
2013: Society for Vascular Surgery, Student
Research Fellowship
Current Position
Orthopaedic Surgery Resident, Lenox Hill Hospital
- 2011– 2015 **Jinny Guo**, University of Iowa, Pharmacy
Current Position
Pharmacy Resident, VAMC, Richmond, VA
- 2015 – 2017 **Anthony Zhang**, University of Iowa, Engineering
Current Position
Medical Student, University of Iowa
- 2017 – 2020 **Lauren Vasilakos**, University of Iowa, Performing Arts
Current Position
Medical Student, University of Minnesota
- 2017 – 2019 **Edvin Rosic**
Current Position
Medical Student, University of Iowa
- 2018 – 2019 **Daniel Dagle**, Iowa State Univ, Mechanical Engineering
Current Position
Graduate student, University of Iowa
- 2018 – 2019 **Erica Hsu**, Dennison University, Biology
Current Position
M1, CCOM
- 2021 – **Jordan Ewald**
Grants Received
2021: Premed Student Summer Research Internship
Current Position
Biomedical Engineering Student, University of Iowa

High School Students

2007 – 2009 **Elise Hsu**, Iowa City West High

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

Grants Received

2009: ARRA Supplement, NIH Summer Research Opportunities for High School and Undergraduate Students (K08 HD050359-03S1; PI: Roghair)

Current Position

Medical Student, NYU

C. Other contributions to institutional programs

- 2005 – Weekly neonatal clinical conference; biannual divisional research presentations
- 2006 – 2012 Coordinator, Department of Pediatrics, Division of Neonatology, Journal Club
- 2008 – 2012 Coordinator, Department of Pediatrics, Grand Rounds-Research Seminar Series

III. **SCHOLARSHIP**

Publications

Peer-reviewed papers

1. **Roghair RD**, Lamb FS, Bedell KA, Smith OM, Scholz TD, and Segar JL. Late gestation betamethasone enhances coronary artery responsiveness to angiotensin II in fetal sheep. *Am J Physiol Regul Integr Comp Physiol* 2004; 286:R80-R88.
2. **Roghair RD**, Lamb FS, Miller FJ, Scholz TD, and Segar JL. Early gestation dexamethasone programs enhanced postnatal ovine coronary artery vascular reactivity. *Am J Physiol Regul Integr Comp Physiol* 2005; 288:R46-R53.
3. **Roghair RD**, Segar JL, Sharma RV, Zimmerman MC, Jadadeesha DK, Segar EM, Scholz TD, and FS Lamb. Newborn lamb coronary artery reactivity is programmed by early gestation dexamethasone prior to the onset of systemic hypertension. *Am J Physiol Regul Integr Comp Physiol* 2005; 289:R1169-76.
4. Segar JL, **Roghair RD**, Segar EM, Scholz TD, and FS Lamb. Early gestation dexamethasone alters baroreflex and vascular responses in newborn lambs prior to hypertension. *Am J Physiol Regul Integr Comp Physiol* 2006; 291:R481-R488.
5. **Roghair RD**, Aldape G. Naturally-occurring perinatal growth restriction in mice programs cardiovascular and endocrine function in a sex- and strain-dependent manner. *Pediatr Res* 2007; 62:399-404.
6. **Roghair RD**, Segar JL, Kilpatrick RA, Segar EM, Scholz TD, Lamb

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

FS. Murine aortic reactivity is programmed equally by maternal low protein diet or late gestation dexamethasone. *J Matern Fetal Neonatal Med* 2007;20:833-41.

7. **Roghair RD**, Miller Jr. FJ, Scholz TD, Lamb FS, Segar JL. Endothelial superoxide production is altered in sheep programmed by early gestation dexamethasone exposure. *Neonatology* 2008; 93:19-27.
8. **Roghair RD**, Miller Jr. FJ, Scholz TD, Lamb FS, Segar JL. Coronary constriction to angiotensin II is enhanced by endothelial superoxide production in sheep programmed by dexamethasone. *Pediatr Res* 2008;63:370-4.
9. Von Bergen NH, Koppenhafer SL, Spitz DR, Volk KA, Patel SS, **Roghair RD**, Lamb FS, Segar JL, Scholz TD. Fetal programming alters reactive oxygen species production in sheep cardiac mitochondria. *Clin Sci (Lond)* 2009;116:659-68.
10. **Roghair RD**, Segar JL, Volk KA, Chappleau MW, Dallas LM, Sorenson AR, Scholz TD, Lamb FS. Vascular nitric oxide and superoxide anion contribute to sex-specific programmed cardiovascular physiology in mice. *Am J Physiol Regul Integr Comp Physiol* 2009; 296:R651-62.
11. Segar EM, Norris AW, Yao JR, Hu S, Koppenhafer SL, **Roghair RD**, Segar JL, Scholz TD. Programming of growth, insulin resistance and vascular dysfunction in offspring of late gestation diabetic rats. *Clin Sci (Lond)* 2009;117:129-38.
12. Hermann GM, Miller RL, Erkonen GE, Dallas LM, Hsu E, Zhu V, **Roghair RD**. Neonatal catch-up growth increases diabetes susceptibility but improves behavioral and cardiovascular outcomes of low birth weight male mice. *Pediatr Res* 2009; 66:53-8.
13. Volk KA, **Roghair RD**, Jung F, Scholz TD, Lamb FS, Segar JL. Coronary endothelial function and vascular smooth muscle proliferation are programmed by early gestation dexamethasone exposure in sheep. *Am J Physiol Regul Integr Comp Physiol* 2010; 298:R1607-14.
14. Hermann GM, Dallas LM, Haskell SE, **Roghair RD**. Neonatal macrosomia is an independent risk factor for adult metabolic syndrome. *Neonatology* 2010; 98:238-244.
15. Erkonen GE, Hermann GM, Miller RL, Thedens DL, Nopoulos PC, Wemmie JA, **Roghair RD**. Neonatal leptin administration alters regional brain volumes and blocks neonatal growth restriction-induced behavioral and cardiovascular dysfunction in male mice. *Pediatr Res* 2011; 69:406-412.
16. **Roghair RD**, Wemmie JA, Volk KA, Scholz TD, Lamb FS, Segar JL.

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

Maternal antioxidant blocks programmed cardiovascular and behavioral stress responses in adult mice. Clin Sci (Lond) 2011; 121:427-36.

17. Kummet GJ, Haskell SE, Hermann GM, Ni C, Volk KA, Younes AK, Miller AK, **Roghair RD**. Neonatal SSRI exposure programs a hypermetabolic state in adult mice. J Nutr Metab 2012:431574.
18. Hermann GM, Cushman TR, Miller RL, **Roghair RD**. Maternal antioxidant improves the neurodevelopmental outcomes of low birth weight mice. Vitam Trace Elem, Vitam Trace Elem 2012; S1:001. doi:10.4172/2167-0390.S1-001
19. Katkhuda R, Peterson ES, **Roghair RD**, Norris AW, Scholz TD, Segar JL. Sex-specific programming of hypertension in offspring of late gestation diabetic rats. Pediatr Res 2012; 72:352-61. (contribution: study design, data interpretation and manuscript preparation)
20. **Roghair RD**, Volk KA, Lamb FS, Segar JL. Impact of maternal dexamethasone on coronary PGE2 production and prostaglandin-dependent coronary reactivity. Am J Physiol Regul Integr Comp Physiol 2012; 303:R513-9.
21. Haskell SE, Hermann GM, Reinking BE, Volk KA, Peotta VA, Zhu V, **Roghair RD**. Sertraline exposure leads to small left heart syndrome in adult mice. Pediatr Res 2013; 73:286-93.
22. Haskell SE, Peotta VA, Reinking BE, Hermann GM, **Roghair RD**. Impact of neonatal sertraline exposure on the post-myocardial infarction outcomes of adult male mice. J Cardiovasc Pharmacol. 2013; 62:479-84.
23. Engelstad HJ, **Roghair RD**, Calarge CA, Colaizy TT, Stuart S, Haskell SE. Perinatal outcomes of pregnancies complicated by maternal depression with or without SSRI therapy. Neonatology 2013; 105:149-154. (contribution: study design, data interpretation and manuscript preparation)
24. Guo JJ, Stoltz DA, Zhu V, Volk KA, Segar JL, McCray Jr. PB, **Roghair RD**. Genotype-specific alterations in vascular smooth muscle cell function in cystic fibrosis piglets. J Cystic Fibrosis 2014; 13:251-9.
25. Dexter BC, Rahmouni K, Cushman T, Hermann GM, Ni C, Nopoulos PC, Thedens DL, **Roghair RD**. Neonatal leptin deficiency reduces frontal cortex volumes and programs adult hyperactivity in mice. Behav Brain Res 2014; 263:115-21.
26. Peotta VA, Bhandary P, Ogu U, Volk KA, **Roghair RD**. Reduced blood pressure of CFTR-F508del carriers correlates with diminished arterial reactivity rather than circulating blood volume in mice. PLoS One 2014; 9:e96756.

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

27. Meyer LR, Zhu V, Miller A, **Roghair RD**. Growth restriction, leptin, and the programming of adult behavior in mice. *Behav Brain Res* 2014; 275C:131-135
28. Shankaran S, Lupton AR, Pappas A, McDonald SA, Das A, Tyson JE, Poindexter BB, Schibler K, Bell EF, Heyne RJ, Pedroza C, Bara R, Van Meurs KP, Grisby C, Huitema CM, Garg M, Ehrenkranz RA, Shepherd EG, Chalak LF, Hamrick SE, Khan AM, Reynolds AM, Laughon MM, Truog WE, Dysart KC, Carlo WA, Walsh MC, Watterberg KL, Higgins RD; Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network. Effect of depth and duration of cooling on deaths in the NICU among neonates with hypoxic ischemic encephalopathy: a randomized clinical trial. *JAMA* 2014; 312:2629-39. (collaborator role on network study)
29. Mueller CA, Eme J, Burggren WW, **Roghair RD**, Rundle SD. Challenges and opportunities in developmental integrative physiology. *Comp Biochem Physiol A Mol Integr Physiol* 2015; 184:113-24. Review. (contribution: conceptual design and manuscript preparation)
30. Haskell SE, Peotta V, Reinking BE, Zhang C, Zhu V, Kenkel EJ, **Roghair RD**. Oral oestrogen reverses ovariectomy-induced morning surge hypertension in growth-restricted mice. *Clin Sci (Lond)*. 2016; 130:613-23.
31. Peotta V, Rahmouni K, Segar JL, Morgan DA, Pitz KM, Rice OM, **Roghair RD**. Neonatal growth restriction-related leptin deficiency enhances leptin-triggered sympathetic activation and central angiotensin II receptor-dependent stress-evoked hypertension. *Pediatr Res* 2016; 80:244-51.
32. Steinbrekera B, **Roghair RD**. Modeling the impact of growth and leptin deficits on the neuronal regulation of blood pressure. *J Endocrinol* 2016; 231:R47-60.
33. Meyer LR, Dexter B, Lo C, Kenkel E, Hirai T, **Roghair RD**, Haskell SE. Perinatal SSRI exposure permanently alters cerebral serotonin receptor mRNA in mice but does not impact adult behaviors; *J Matern Fetal Neonatal Med* 2018; 31:1393-1401. (contribution: study design, data interpretation and manuscript preparation)
34. Haskell SE, Lo C, Kent ME, Eggleston TM, Volk KA, Reinking BE, **Roghair RD**. Cardiac outcomes after perinatal sertraline exposure in mice; *J Cardiovasc Pharmacol* 2017; 70:119-127.
35. Knott MH, Knott MH, Haskell SE, Strawser PE, Rice OM, Bonthius NT, Movva VC, Reinking BE, **Roghair RD**. Neonatal growth restriction

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

- slows cardiomyocyte development and reduces adult heart size. *Anat Rec (Hoboken)*. 2018; 301:1398-1404.
36. Chatmethakul T, **Roghair RD**. Risk of hypertension following perinatal adversity: IUGR and prematurity. *J Endocrinol*. 2019; 242:T21-T32.
37. Ansah DA, Reinking BE, Colaizy TT, **Roghair RD**, Haskell SE. A prospective study evaluating the effects of SSRI exposure on cardiac size and function in newborns. *Neonatology*. 2019; 115:320-327. (contribution: study design, data interpretation and manuscript preparation)
38. Steinbrekera B, Colaizy TT, Vasilakos LK, Johnson KJ, Santillan DA, Haskell SE, **Roghair RD**. Origins of neonatal leptin deficiency in preterm infants. *Pediatr Res*. 2019; 85:1016-1023.
39. Vass RA, **Roghair RD**, Bell EF, Colaizy TT, Johnson KJ, Schmelzel ML, Walker JR, Ertl T. Pituitary glycoprotein hormones in human milk before and after pasteurization or refrigeration. *Nutrients*. 2020; 12:687. (contribution: study design, data interpretation, manuscript preparation and submission as corresponding author)
40. Gaddam RR, Jacobsen VP, Kim YR, Gabani M, Jacobs JS, Dhuri K, Kumar S, Kassan M, Li Q, Bahal R, **Roghair R**, Irani K, Vikram A. Microbiota-governed microRNA-204 impairs endothelial function and blood pressure decline during inactivity in db/db mice. *Sci Rep*. 2020; 10:10065. (contribution: study design, data interpretation and manuscript preparation)
41. Vass RA, Bell EF, Colaizy TT, Schmelzel ML, Johnson KJ, Walker JR, Ertl T, **Roghair RD**. Hormone levels in preterm and donor human milk before and after Holder pasteurization. *Pediatr Res*. 2020; 88:612-617.
42. Laptook AR, Shankaran S, Barnes P, Rollins N, Do BT, Parikh NA, Hamrick S, Hintz SR, Tyson JE, Bell EF, Ambalavanan N, Goldberg RN, Pappas A, Huitema C, Pedroza C, Chaudhary AS, Hensman AM, Das A, Wyckoff M, Khan A, Walsh MC, Watterberg KL, Faix R, Truog W, Guillet R, Sokol GM, Poindexter BB, Higgins RD; Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network. Limitations of conventional magnetic resonance imaging as a predictor of death or disability following neonatal hypoxic-ischemic encephalopathy in the late hypothermia trial. *J Pediatr*. 2021; 230:106-111. (collaborator role on network study)
43. Vass RA, Kiss G, Bell EF, **Roghair RD**, Miseta A, Bódis J, Funke S, Ertl T. Breast milk for term and preterm infants-own mother's milk or

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

- donor milk? *Nutrients* 2021; 13:424. (contribution: study design, manuscript preparation and revision)
44. Chalak LF, Pappas A, Tan S, Das A, Sánchez PJ, Laptook AR, Van Meurs KP, Shankaran S, Bell EF, Davis AS, Heyne RJ, Pedroza C, Poindexter BB, Schibler K, Tyson JE, Ball MB, Bara R, Grisby C, Sokol GM, D'Angio CT, Hamrick SEG, Dysart KC, Cotten CM, Truog WE, Watterberg KL, Timan CJ, Garg M, Carlo WA, Higgins RD; Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network. Association of increased seizures during rewarming with abnormal neurodevelopmental outcomes at 2-year follow-up: a nested multisite cohort study. *JAMA Neurol.* 2021; 78:1484-1493. (collaborator role on network study)
45. Dagle JM, Rysavy MA, Hunter SK, Colaizy TT, Elgin TG, Giesinger RE, McElroy SJ, Harmon HM, Klein JM, McNamara PJ, Rabe GK, Bell EF, Thomas BA, Bischoff AR, Rios DR, Lindower JB, Bermick JR, Lee SS, Wong SW, **Roghair, RD**, Morgan-Harris AT, Niwas R, Arikat S, Boly TJ, Segar JL. Cardiorespiratory management of infants born at 22 weeks' gestation: the Iowa approach. *Semin Perinatol* 2022; 46:151545. (contribution: conception and revision)
46. Vasilakos LK, Steinbrekera B, Santillan DA, Santillan MK, Brandt DS, Dagle D, **Roghair RD**. Umbilical cord blood leptin and IL-6 in the presence of maternal diabetes or chorioamnionitis. *Front. Endocrinol* 2022; 13:836541; <https://doi.org/10.3389/fendo.2022.836541>
47. Kent ME, Hu B, Eggleston TM, Squires RS, Zimmerman KA, Weiss RM, **Roghair RD**, Lin F, Cornell RA, Haskell SE. Hypersensitivity of zebrafish *htr2b* mutant embryos to sertraline indicates a role for serotonin signaling in cardiac development. *J Cardiovasc Pharmacol* 2022; 80:261-9. (contribution: conception, data interpretation and manuscript revision)
48. Chatmethakul T, Schmelzel ML, Johnson KJ, Walker JR, Santillan DA, Colaizy TT, **Roghair RD**. Postnatal leptin levels correlate with breast milk leptin content in infants born before 32 weeks gestation. *Nutrients* 2022; 14:5224
49. Vass RA, Bell EF, **Roghair RD**, Kiss G, Funke S, Bokor S, Molnár D, Miseta A, Bódis J, Kovács K, Ertl T. Insulin, testosterone, and albumin in term and preterm breast milk, donor milk, and infant formula. *Nutrients* 2023; 15:1476.
50. Roghair RD, Colaizy TT, Steinbrekera B, Vass RA, Hsu E, Dagle D, Chatmethakul T. Neonatal Leptin Levels Predict the Early Childhood Developmental Assessment Scores of Preterm Infants. *Nutrients.* 2023; 15:1967.

Robert D. Roghair, M.D.

B. Areas of Research Interest and Current Projects

<https://roghair.lab.uiowa.edu/research>

The Roghair lab investigates the developmental origins of adult cardiometabolic disease across a number of model systems. This work originated with the realization that an adverse perinatal environment increases the risk of adult hypertension and obesity.

Prematurity: As a neonatologist, Dr. Roghair is driven to help bring a brighter future to premature infants. Premature infants are at an increased risk of hypertension, diabetes and obesity, and the risks are greatest in those born at the earliest gestations. With survival rates exceeding 90% for infants born as early as 23 weeks gestation, we are addressing critical knowledge gaps including longitudinal growth and body composition analysis, evidence-based nutritional recommendations and strategies to improve long-term cardiometabolic health. Our proposals leverage key clinical data, critical basic science discoveries and an interdisciplinary team of professionals to investigate quality improvement strategies and innovative therapeutic applications that could transform neonatal management with a positive impact on long-term cardiometabolic health. The figure on my website shows the profound leptin deficiency that develops following preterm delivery with postnatal levels far below the reference levels obtained from umbilical cord blood at the same gestation.

Growth Restriction: Mouse models of natural growth restriction and diet-based perturbations of the perinatal environment are currently being studied as they relate to cardiovascular, behavioral and metabolic outcomes. The second Figure on our website demonstrates a normalization of adult learning when neonatal growth restriction-related leptin deficiency is prevented with neonatal leptin supplementation.

SSRI Exposure: A significant percentage of pregnant women receive antidepressants during pregnancy. Although short-term side effects are manageable, there is emerging evidence intrauterine SSRI exposure may program adult cardiovascular and behavioral outcomes. Utilizing complementary mouse models and epidemiological studies, we are defining the molecular underpinnings of this “post-SSRI syndrome”.

Cystic Fibrosis: Our proximity to the cystic fibrosis research groups at the University of Iowa led to our observation that the most common cystic fibrosis-causing mutation (CFTR-deltaF508) significantly impacts vascular tone. We are now aggressively assessing the effect of CFTR on arterial function in a number of species, including mice, pigs and humans that carry a copy of the CFTR-deltaF508 mutation.

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

C. Grants Received

“Research Training Program in Pediatric Cardiology”
NIH Ruth L. Kirschstein National Research Service Award (NRSA),
T32 HL07413
6/30/02 – 6/29/04
Larry T. Mahoney, M.D. (PI)
100% effort (fellow on training grant)

“Corticosteroids in the Programming of Coronary Artery Disease”
Advancing Newborn Medicine Fellowship Grant Program (Forest
Pharmaceuticals, Inc.)
2003-2004
Robert D. Roghair, M.D. (PI)
0% effort (fellow on training grant, no salary support)

“Physicians Training Program in Neonatal Biology”
NIH Ruth L. Kirschstein National Research Service Award (NRSA),
T32 HD041922
7/1/04 – 6/30/05
John A. Widness, M.D. (PI)
100% effort (fellow on training grant)

“Molecular and Cellular Research to Advance Childhood Health”
NIH Child Health Research Center Career Development Award
K12 HD027748
7/1/05 - 6/30/06
Michael Artman, M.D. (PI)
100% effort (CHRC scholar)

“Characterization of a murine model of fetal programming”
Children’s Miracle Network Research Grant
1/1/06 – 12/31/06
Robert D. Roghair, M.D. (PI)
0% effort (no salary support allowed)

“Pathways of fetal programming of coronary dysfunction”
NIH/NICHD
K08 HD050359
\$116,575
8/1/06-7/31/11
Robert D. Roghair, M.D. (PI)
80% effort (9.6 months); reduced to 50% effort on 8/1/10 due to R01
This study investigated the contribution of prostanoids and reactive
oxygen species in coronary artery dysfunction programmed by early

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Robert D. Roghair, M.D.

gestation dexamethasone administration in sheep.

“Pathways of fetal programming of coronary dysfunction”

NIH/NICHD

K08 HD050359-S1

8/1/09-10/31/10

Robert D. Roghair, M.D. (PI)

This administrative supplement from the American Recovery and Reinvestment Act supported summer research experiences for undergraduate and high school students.

“Developmental Origins of Central Blood Pressure Dysregulation”

Children’s Miracle Network Research Grant

1/1/09 – 6/30/10

Robert D. Roghair, M.D. (PI)

0% effort (no salary support allowed)

This grant investigated the role of neonatal leptin deficiency in the programming of stress-induced hypertension in mice.

“Effect of Perinatal SSRI Exposure on Adult Heart Rate Regulation”

American Heart Association, Midwest Affiliate

Undergraduate Student Research Fellowship

6/1/10 – 8/31/10

Ran Zhang (PI)

0% effort (Role: mentor and sponsor)

“Neonatal Growth and the Neurodevelopmental Origins of Hypertension”

NIH/NHLBI

R01 HL102659

\$250,000

8/1/10-5/31/16

Robert D. Roghair, M.D. (PI)

35% effort (4.2 calendar months)

This grant investigated the role of neonatal leptin deficiency in the programming of central angiotensin II-mediated hypertension.

“Molecular and Cellular Research to Advance Childhood Health”

NIH/NICHD

K12 HD027748

1/1/12-12/31/14

Hirsch (PI)

0% effort (Role: mentor)

This institutional training grant provides support to junior faculty members within the Department of Pediatrics.

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

“Impact of the CFTR- Δ F508 Mutation on Perinatal Cardiovascular Physiology”

Institute for Clinical and Translational Science Pilot Grant

7/1/12 – 6/30/13

Robert D. Roghair, M.D. (PI)

0% effort (no salary support allowed)

This grant investigated the effect of the Δ F508 mutation on uterine and umbilical artery flow and umbilical smooth muscle cell calcium handling.

“Pregnancy as a Risk Factor for Hyperglycemia-Induced Vasculopathy”

Society for Vascular Surgery Foundation Student Research Fellowship

5/1/13 – 4/30/14

Kaisen Yao (PI)

0% effort (Role: mentor and sponsor)

“Leptin and the Programming of Sex-Specific Cardiovascular Disease”

American Heart Association, Midwest Affiliate

Undergraduate Student Research Fellowship

6/1/13 – 8/31/13

Vivian Zhu (PI)

0% effort (Role: mentor and sponsor)

“Short-term Training for Students in the Health Professions”

NIH/NHLBI

T35 HL007485

\$242,000

5/1/15-4/30/21 (NCE)

Robert D. Roghair, M.D. (PI)

0% effort

Funds 12 week summer research experiences for 32 rising M2 students.

“Leptin Deficiency of Prematurity”

Children’s Miracle Network Research Grant

7/1/17 – 6/30/18

Baiba Steinbrekera, M.D. (PI)

0% effort (Role: mentor and sponsor)

“Gut-microbiota sensitive vascular microRNA-204 (mir-204) promotes diabetes-associated non-dipping hypertension”

UI Center for Hypertension Research Pilot Project

\$50,000

7/1/17 – 6/30/18

Roghair RD and Vikram A (co-PI)

0% effort

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Robert D. Roghair, M.D.

“Maternal and neonatal determinants of critically important hormone levels”

UI Premed Student Summer Research Internship

\$4000

6/1/21 – 7/31/21

0% effort (Role: mentor and sponsor)

“Medical Student Summer Research Program”

NIH/NHLBI

T35 HL166206

\$143,398

3/1/23-2/29/28

Robert D. Roghair, M.D. (PI)

0% effort

Funds 3 month-long summer research experiences for 16 rising M2 students engaged in Heart, Lung, Blood or Sleep-related research.

“Sedentary behavior, physical activity, and 24-hour behavior in pregnancy and offspring health: The Pregnancy 24/7 Offspring Study”

NIH/NHLBI

R01 HL164662

\$702,700

4/17/23-2/29/28

Whitaker, Kara and Barone Gibbs, Bethany (MPI)

5% effort or 0.6 calendar months (Role: collaborator)

The overall goal is to examine the associations of sedentary behavior and moderate-to-vigorous physical activity across pregnancy with offspring obesity risk and cardiovascular disease risk through 24 months.

“Iowa Medical Student Summer Research Program in trans-NIDDK Research”

NIH/NIDDK

T35 DK135446

\$102,689

5/1/23-4/30/28

Robert D. Roghair, M.D. (PI)

0% effort

Funds 3 month-long summer research experiences for 12 rising M2 students engaged on trans-NIDDK research.

D. Invited Lectures and Presentations

Roghair RD, Lamb FS, Scholz TD, Miller FJ, and Segar, JL. “Early gestation dexamethasone programs enhanced coronary reactivity”. Brody Research Colloquium on Brain, Body Fluid Balance and Blood Pressure. University of Iowa Cardiovascular Center. February 2003.

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

Roghair RD, Lamb FS, Scholz TD, Miller FJ, and Segar, JL. "Programming of coronary artery dysfunction by early gestation dexamethasone exposure". 63rd Perinatal and Developmental Medicine Symposium, Marco Island, Florida. November 2003.

Roghair RD, Lamb FS, Miller FJ, Scholz TD, and Segar, JL. "Prenatal programming of coronary artery disease". Department of Pediatrics Combined Research Seminar. University of Iowa Carver College of Medicine. June 2004.

Roghair RD, Lamb FS, Miller FJ, Scholz TD, and Segar, JL. "Programmed coronary artery dysfunction". Child Health Research Centers Annual Retreat. Dear Valley, Utah. September 2005.

Roghair RD. "Fetal Programming of Cardiovascular Disease: Role of Reactive Oxygen Species" Cardiovascular Center Seminar. University of Iowa. January 2007.

Roghair RD, "Sex Differences in Fetal Programming of Metabolic and Cardiovascular Diseases" Organization for the Study of Sex Differences Annual Meeting. Toronto, Canada. June 2009

Roghair RD, "Vascular nitric oxide and superoxide anion contribute to sex-specific programmed cardiovascular physiology in mice" Aspen Perinatal Biology Conference. Aspen, CO. August 2010.

Roghair RD, "Vascular nitric oxide and superoxide anion contribute to sex-specific programmed cardiovascular physiology in mice" Environmental Health Sciences Research Seminar. Iowa City, IA. April 2012.

Roghair RD, "Neurodevelopmental Origins of Hypertension" Frontiers in Pediatric Research, Iowa City, IA. January 2014.

Roghair RD, "Evaluation of the ill newborn" Grand Rounds, Northeast Iowa Medical Education Foundation, Waterloo, IA. August 2014.

Roghair RD, "Sex, stress, leptin and the programming of hypertension" Neonatology Grand Rounds. University of Colorado, Denver, CO. September 2014.

Roghair RD, "Cardiac arrest: long-term implications of a heart left two sizes too small" Perinatal Research Center Conference. University of Colorado, Denver, CO. September 2014.

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

Roghair RD, “Mitigating the Risks Associated with Accelerated or Deficient Perinatal Growth” APS Intersociety Meeting: Comparative Approaches to Grand Challenges in Physiology, San Diego, CA. October 2014.

Roghair RD, “Neurodevelopmental Origins of Hypertension” University of Illinois-Chicago, Chicago, IL. October 2014.

Roghair RD, “Developmental Origins of Health and Disease” University of Iowa Maternal-Fetal Medicine Conference, November 2014.

Roghair RD, “Neurodevelopmental Origins of Hypertension” University of Iowa Diabetes Research Center Seminar, February 2015.

Roghair RD, “Developmental Origins of Adult Cardiovascular Disease” University of Iowa Summer Undergraduate MSTP Research Seminar, June 2015.

Roghair RD, “Fluid and Electrolyte Management in Preterm & Term Infants”, University of Iowa Department of Pediatrics Resident Core Lecture, February 2016

Roghair RD, “Cardiovascular Outcomes Following Intrauterine Undernutrition or Preterm Delivery” Aspen Perinatal Biology Conference. Snowmass, CO. August 2016.

Roghair RD, “Translational Cardiovascular Investigations in Sheep and Transgenic Pigs” Michigan State University, Lansing, MI, March 2017.

IV. SERVICE

A. Committees

2008- Pediatrics Research Committee, member
2009- Carver College of Medicine, intramural grant reviewer
2009- Pediatrics Residency Recruitment, member
2013-15 Physician Scientist Training Program, Pediatrics, director
2014- Medical Student Research Council, CCOM, director
2016 Kristin Clafin, PhD Thesis Committee, Pharmacology, member
2021- Promotion Advisory Committee, Department of Pediatrics
2022- Diversity, Equity and Inclusion Committee, Department of Pediatrics, liaison for the Division of Neonatology
2022- Diversability Employee Resource Group, UIHC, member
2022- JEDI Working Group for Neonatology, leader
2023- Society of Pediatric Research JEDI Task Force, member
2023- Pediatric Academic Society Annual Meeting, DEI Committee, representing the Society of Pediatric Research

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

B. Professional affiliations

- 2005 - Member, American Academy of Pediatrics
- 2006 - Member, Midwest Society for Pediatric Research
- 2006 - Member, American Physiological Society
- 2007- Member, Society for Pediatric Research
- 2013- Member, American Heart Association
- 2021- Member, American Pediatric Society

C. Clinical Assignments

University of Iowa Hospitals and Clinics, Iowa City, Iowa
Staff the neonatal intensive care units 2 to 3 months a year

Covenant Medical Center, Waterloo, Iowa
Genesis Medical Center, Davenport, Iowa
Mercy Medical Center, Cedar Rapids, Iowa
Provide NICU coverage at each location, as needed

D. External Peer Reviews

1. NIH Study Sections

- 2011 Scientific Review Group 2012/01 ZES1 LWJ-J (DI) convened to review NIEHS R21 applications in response to the FOA, *"Dietary Influence on the Human Health Effects of Environmental Exposures"*
- 2015 Pregnancy and Neonatology Study Section [PN]
- 2017 Pregnancy and Neonatology Study Section [PN]
- 2017 Integrated Review Group ZRG1 F06-A 20 convened to review submissions to the Endocrinology, Metabolism, Nutrition & Reproductive Sciences (EMNR) Fellowship Panel
- 2018 Pregnancy and Neonatology Study Section [PN]
- 2018 CSR Anonymization Study (EMNR IRG)
- 2022 Scientific Review Group 2022/08 ZHD1 DSR-K (91) convened to review NICHD Loan Repayment Program applications
- 2023 Scientific Review Group 2023/08 ZHD1 DSR-K (90) convened to review NICHD Loan Repayment Program applications

2. Journals

American Journal of Physiology - Endocrinology and Metabolism
American Journal of Physiology - Heart and Circulatory Physiology
American Journal of Physiology - Regul, Integr and Comp Physiol
Antioxidants and Redox Signaling
Applied Microbiology
Autonomic Neurosci Basic and Clinical

COLLEGE OF MEDICINE CURRICULUM VITAE

Robert D. Roghair, M.D.

BMC Genomics
BMC Physiology
Cardiology
Children
Circulation
Circulation Research
Comparative Biochemistry and Physiology
Current Hypertension Reviews
Diabetes
Early Human Development
Experimental Physiology
Expert Review of Endocrinology and Metabolism
Foods
Frontiers in Endocrinology – Pediatric Endocrinology
Frontiers in Neurology
Frontiers in Pediatrics - Neonatology
Frontiers in Physiology - Developmental & Metabolic Physiology
2021-Present: Associate Editor
2022-23: Guest Editor: Model Organisms in Physiology
2022-23: Guest Editor: Bioenergetic Profile in Pediatrics
Healthcare
Hormone and Metabolic Research
Hormones and Behavior
Hypertension
International Journal of Environmental Research and Public Health
Jornal de Pediatria
Journal of American Heart Association
Journal of Applied Physiology
Journal of Cystic Fibrosis
Journal of Developmental Origins of Health and Disease
Journal of Endocrinology
Journal of Maternal Fetal and Neonatal Medicine
Journal of Neonatal-Perinatal Medicine
Journal of Pediatric Biochemistry
Journal of Pediatric Genetics
Journal of Pediatric Neurology
Journal of Physiology
Journal of the Renin Angiotensin Aldosterone System
Life Sciences
Molecular and Cellular Biochemistry
Molecular and Cellular Endocrinology
Nutrients
2021-Present: Section Editor for Pediatric Nutrition
2022: Guest Editor: Complementary Feedings
2023: Guest Editor: Benefits of Breastfeeding

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Robert D. Roghair, M.D.

Nutrition Reviews
Pediatric Reports
Pediatric Research
Pediatrics
Physiological Genomics
PLOS One
Reproductive Sciences
Veterinary Sciences
Women's Health
Yale Journal of Biology and Medicine