KRISTEN E. BOYLE, PHD

CURRICULUM VITAE

Associate Professor
University of Colorado School of Medicine
Department of Pediatrics, Section of Nutrition

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RESEARCH EXPERTISE & GOALS

My research focuses on understanding how fetal exposures predispose infants to metabolic disease later in life. I aim to develop precision approaches for obesity prevention by identifying gestational exposures most impactful and testing their modifiability through pregnancy interventions, thereby informing evidence-based prenatal clinical care.

- Expertise in metabolism, mitochondrial physiology, epigenetics, endocrinology, exercise physiology, and nutrition
- 18 years investigating metabolic phenotypes in primary human stem cells
- Pioneered the use of human umbilical cord mesenchymal stem cells to investigate molecular and metabolic phenotypes predictive of metabolic disease
- 14 years of continuous NIH funding

EDUCATION TRAINING & IMPLEMENTATION

I am a passionate mentor for the next generation of scientists and educators, through career development and guiding their work in my lab.

- Participated in mentoring and leadership training, fostered skills of communication, goal setting, and accountability
- Mentored 2 faculty members, 6 postdoctoral fellows, 6 graduate/medical students, and 14 high school, undergraduate, and graduate level research interns
- Proud reviewer for internal grant review programs geared toward honing the grant writing skills of early career scientists
- Leadership in local and national organizations, developed early career educational components including oral sessions, career development-focused seminars, and panel discussions

CONTENTS

EDUCATION

1996-2001 *University of Massachusetts, Amherst, MA*
Bachelor of Science in Exercise Science and Nutrition, *cum laude*
Minor: English
Interdisciplinary Honors Program

2002-2005 *Ohio University, Athens, OH*
Master of Science in Exercise Physiology
Thesis: Ghrelin reflects changes in body size, not energy availability

2005-2009 *East Carolina University, Greenville, NC*
Doctor of Philosophy in Bioenergetics
Dissertation: Metabolic inflexibility in skeletal muscle with obesity

2009-2012 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Postdoctoral Fellowship
Project: Skeletal muscle mitochondrial capacity in pregnant women with obesity and diabetes

ACADEMIC POSITIONS

2013-2019 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Assistant Professor
School of Medicine, Department of Pediatrics, Section of Nutrition

2018-Present *University of Colorado Anschutz Medical Campus, Aurora, CO*
Graduate Faculty Appointment
- Cell Biology, Stem Cells, and Development Program
- Integrated Physiology
- Biomedical Sciences Program

2019-Present *University of Colorado Anschutz Medical Campus, Aurora, CO*
Associate Professor
School of Medicine, Department of Pediatrics, Section of Nutrition

2023-Present *Colorado Nutrition Obesity Research Center (NORC), Aurora, CO*
Associate Director of the Pilot and Feasibility Program

HONORS, AWARDS, & SPECIAL RECOGNITION

1996-1998 State of Connecticut Academic Scholarship

1996-2001 Commonwealth of Massachusetts Academic Scholarship

2001 Commonwealth Scholar, University of Massachusetts, Amherst

2003-2004 Department of Biological Sciences Travel Grant, Ohio University

2011-2013 National Institutes of Health Loan Repayment Program Recipient

2012 Seahorse Bioscience Travel Award Recipient

2013, 2016 University of Colorado Women's Health Research Day Poster Award ***Awarded to top 5 abstract presentations of ~30*

2014-2016	National Institutes of Health Loan Repayment Program Recipient
2015	Young Investigator Travel Grant Award Recipient, American Diabetes Association ***Awarded to junior scientist presenters of top abstracts*
2015	President's Oral Session Abstract Selection, American Diabetes Association ***Top 8 abstracts of over 4,000*
2017	Nominated and elected for Perinatal Research Society Membership
2021	William Hansel Visiting Scientist Lecture, Pennington Biomedical Research Center, Baton Rouge, LA
2023	Nominated and elected for Perinatal Research Society Basic Science Council

PROFESSIONAL MEMBERSHIP

2003-2005	American College of Sports Medicine (ACSM)
2009-Present	American Society for Nutrition (ASN)
2013-Present	The Obesity Society (TOS)
2013-Present	American Diabetes Association (ADA)
2014-2015	The American Heart Association (AHA)
2017-Present	Perinatal Research Society (PRS)

SERVICE

2006-2007 *Graduate Student Organization, East Carolina University*
Vice President
Assisted in organizing graduate students for self-advocacy programs, fund raisers.

2013-2015 *Pediatric Nutrition Seminar Series, University of Colorado Anschutz*
Co-Chair/Chair
Assisted in coordinating speakers and speaking locations for lecture series sponsored by the Section of Nutrition in the Department of Pediatrics at the University of Colorado.

2013-Present *Ludeman Family Center for Women's Health Research, University of Colorado Anschutz*
Junior Faculty Affiliate
I participate in fundraising and community awareness events, representing the center. I present my research at the Annual Board Meeting and to affiliated lay audiences as opportunities arise. I have attended and participated in meetings with local members of the United States Congress to advocate for and advance the mission of the center.

2014-2019 *Department of Pediatrics Junior Faculty Interest Group, University of Colorado Anschutz*
President: 2017-2019
Member: 2014-2017
We plan and participate in quarterly events geared toward junior faculty training and development (e.g., promotions, grant management, wellness). We advocate for policy change at the department level for issues important to junior faculty (e.g., faculty recognition, paid family leave, faculty equity). We share responsibility for representation at Academic Affairs meetings and revision of Department of Pediatrics Faculty Handbook.

2015-Present *Gates Center for Regenerative Medicine, University of Colorado Anschutz*
Member

2019-2021 *Women's Reproductive Health Research K12 Career Development Award*
Member: Internal Advisory Committee

2020-Present *Department of Pediatrics, Section of Nutrition, University of Colorado Anschutz*
Member: Awards Committee

2021-2022 *American Society for Nutrition*
Chair-Elect: Maternal, Perinatal and Pediatric Nutrition Research Interest Section

2021-2023 *Colorado Nutrition Obesity Research Center*
Rotating Member: Executive Committee

2021-Present American Diabetes Association/European Association for the Study of Diabetes: Precision Medicine Diabetes Initiative
Member: Precision Prognostics for Gestational Diabetes Working Group

2022-2023 *American Society for Nutrition*
Chair: Maternal, Perinatal and Pediatric Nutrition Research Interest Section

2022-Present *American Society for Nutrition*
Member: Membership Committee

2023-Present *American Society for Nutrition*
Past Chair: Maternal, Perinatal and Pediatric Nutrition Research Interest Section

2023-Present *Perinatal Research Society*
Basic Science Council Member (elected position)

EDUCATION TRAINING & IMPLEMENTATION

I am passionate about mentoring the next generation of scientists and educators through career development and through guiding their work in my lab. The following sections highlight my work in this area. To facilitate my mentoring endeavors, I have participated in several intensive mentoring and leadership training programs to foster skills of communication, goal setting, and accountability. I teach courses through the graduate school at CU Anschutz and I have mentored 2 faculty members, 7 postdoctoral fellows, 5 graduate or medical students, and 14 high school, undergraduate, and graduate level researchers. I have also served on many graduate and postdoctoral thesis committees. I take pride in participating in a variety of internal grant review programs at CU Anschutz so that I can help early career scientists hone their grant writing skills. I have held several leadership positions at the local and national levels. In these roles, I have developed early career educational components including oral sessions for annual meetings, networking events, career development-focused seminars, and panel discussions.

ACADEMIC CERTIFICATIONS & CAREER DEVELOPMENT

2011-2012 *Co-Mentor Training*, Colorado Clinical and Translational Sciences Institute (4 x 5 hr sessions). Participated as mentee with post-doctoral mentor.

2012-2014 *Responsible Conduct of Research Training*, University of Colorado School of Medicine (9 x 1 hr sessions)

2013-Present *Health Information Privacy and Security Training*, Collaborative Institution Training Initiative (CITI) Program (online training/certification)

2013-Present	Junior Faculty Training Modules, University of Colorado Center for Women's Health Research (1-3 x 1 hr sessions per year)
2014-2015	*Women's Leadership Training*, Women in Medicine and Science, University of Colorado School of Medicine (4 x 5-8 hr sessions, 50 women selected/year)
2015	*Examining a Developmental Approach to Childhood Obesity: The Fetal and Early Childhood Years Workshop*, Institute of Medicine and National Research Council of the National Academies, Washington DC (2 x 8 hr sessions)
2016	*Nutrigenetics, Nutrigenomics, and Precision Medicine Short Course*, University of Carolina Nutrition and Obesity Research Center, Kannapolis, NC (4 x 8 hr sessions)
2023-2024	*Co-Mentor Training*, Colorado Clinical and Translational Sciences Institute (4 x 5 hr sessions). Participated as mentor with post-doctoral mentee.
2024	*Upstander/Bystander Training,* University of Colorado Office of Research Education and Office of Diversity, Equity, and Inclusion (1 hr lecture and discussion)

REVIEW & REFEREE

Grant Proposal Review

2015-Present	*Reviewer*, Colorado Clinical & Translational Sciences Institute Pre-K Review Program: Internal review and study section of NIH K award or similar grant mechanisms (3 cycles per year)
2017-Present	*Ad Hoc Reviewer*, Colorado Clinical & Translational Sciences Institute K to R Transition Program: Internal review and study section of NIH R01 or similar grant mechanisms
2017-2018	*Reviewer*, American Association for the Advancement of Sciences (AAAS) Research Competitiveness Program: Supports and coordinates peer-review of proposals to U.S. and International grant organizations (1-2 cycles per year)
2018-2020	*Reviewer*, Dr. Lorna Moore Launch Award, University of Colorado Anschutz Medical Campus
2018	*Reviewer*, Colorado Clinical & Translational Sciences Institute Child Maternal Health Pilot Award Program
2019	*Reviewer*, Center for Women's Health Research Junior Faculty Seed Grant Program, University of Colorado Anschutz Medical Campus
2019-Present	*Reviewer*, University of Colorado Graduate School NRSA Mock Review Program, Internal review and study section of NIH F award or similar grant mechanisms
2020-Present	*Member,* Colorado CTSI Pilot Award Program Review Committee
2020-Present	*Member,* NIH NIDDK Special Emphasis Panel
2021	*Ad hoc reviewer*, NIH NHLBI SBIR Special Emphasis Panel
2021	*Ad hoc reviewer*, NIH NIDDK NMDH Study Section

2021	*Stage I reviewer*, NIH Director's New Innovator Award Program
2022-Present	*Reviewer*, Ludeman Center for Women's Health Research Junior Faculty Seed Grant Program, University of Colorado Anschutz Medical Campus
2022	*Reviewer,* Research Institute Research Scholar Award Program, Children's Hospital Colorado, Anschutz Medical Campus
2023	*Ad hoc reviewer*, NIH NIEHS K99 Special Emphasis Panel
2023	*Ad hoc reviewer*, NIH NIEHS K Award Special Emphasis Panel
2024	*Reviewer,* USDA National Program 107, Panel 8 – Animal Studies

Internship Application Review

2017-Present	*Reviewer*, Children's Hospital Colorado Child Health Research Internship: Review of >30 applications for 8-week summer research internship (1 cycle per year)

Abstract Review

2019-Present	*Reviewer*, American Society for Nutrition Annual Conference

Manuscript Review

Verified Peer Review Record at *Publons:* publons.com/a/1337364/

Ad-hoc Reviewer for:

Adipocyte
American Journal of Obstetrics & Gynecology
American Journal of Physiology
Applied Physiology, Nutrition, and Metabolism
Archives of Physiology and Biochemistry
Biotechniques
Cell Biology International
Cell Reports
Childhood Obesity
Diabetes
Diabetologia
Epigenomics
European Journal of Nutrition
Experimental Physiology
International Journal of Obesity
International Journal of Sports Medicine
Journal of Applied Physiology
Journal of Clinical Investigation
Journal of Diabetes and its Complications
Journal of Molecular Endocrinology
Molecular Nutrition and Food Research
Metabolites
Pediatric Research
Reproduction
Scientific Reports
Stem Cells
The FASEB Journal
Obesity

INVITED LECTURES

International

1. Maternal Obesity and Offspring Adiposity: Clues from Umbilical Cord Mesenchymal Stem Cells. Obesity and Adipose Tissue Biology, Keystone Symposia, Banff, Alberta, Canada, February 2019.

2. Epigenetic Mechanisms for Altered Infant Metabolism with Maternal Obesity: Insights from Umbilical Cord Stem Cells. Perinatal Society of Australia & New Zealand Virtual Congress 2021. Sydney, Australia, March 2021.

National

1. Maternal obesity and the fetal programming of disordered metabolism. The National Conference on Women's Health Research: Sex Differences Across the Lifespan, Colorado Springs, CO, September 2016.

2. Programming of Adiposity and Metabolism. Pediatric Academic Societies Meeting. San Francisco, CA, May 2017.

3. Umbilical Cord Mesenchymal Stem Cells: Programmed Risk? Aspen/Snowmass Perinatal Biology Meeting, Aspen, CO, August 2019.

4. Programmed epigenetic risk: Can stress exposures in utero predispose infants to obesity and metabolic disease? American Society for Biochemistry and Molecular Biology (ASBMB) Meeting, Philadelphia, PA, April 2022.

5. Maternal, Perinatal, and Pediatric Research Interest Section Business Meeting. American Society for Nutrition Annual Meeting. Nutrition Live Online, June 2022.

6. Fetal Exposure to PFAS is associated with altered gene expression and triglyceride stores: Explorations in infant umbilical cord mesenchymal stem cells. NIH ECHO Discovery Presentation. September 2022.
7. Epigenetic markers for obesity risk in the fetus: Can we future proof against weight gain? Pennington Biomedical Research Center Scientific Symposium: Precision Prevention, Diagnostics and Treatment of Obesity: Pipedream or Reality? Baton Rouge, LA. April 2024.

Regional

1. Skeletal Muscle Lipid Oxidation: Substrate Selection and Obesity, Metabolism Interest Group, University of Colorado Anschutz Medical Campus, March 2009.

2. Pediatric Obesity: From the Womb. Denver Dietetic Association, Denver, CO. February 2010.

3. Maternal Programming of Fetal Stem Cells: How Obesity in Pregnancy Imparts Disease Risk in the Next Generation. University of Missouri Nutrition and Exercise Physiology Seminar Series, Columbia, MO. March 2015.

4. Maternal Obesity Alters Fat Metabolism and DNA Methylation in Stem Cells from Human Infants. Building Better Babies Symposium. Aurora, CO, May 2017.

5. Maternal Obesity and the Epigenetic Regulation of Offspring Adiposity. Animal Reproduction & Biotechnology Laboratory Seminar Series. Colorado State University, Fort Collins, CO, November 2018.

6. Umbilical Cord Derived Mesenchymal Stem Cells Characterize Phenotypes of Infants Born to Mothers with Obesity. SCORE Seminar Series, University of Colorado Boulder, Boulder, CO. December 2019.

7. Maternal Obesity and Offspring Adiposity: Identifying Mechanisms for Obesity Risk Using Umbilical Cord Derived Mesenchymal Stem Cells. Center for Children's Healthy Lifestyles & Nutrition Seminar Series, University of Kansas Medical Center. March 2020.

8. Maternal obesity and offspring adiposity: How stress exposures in utero predispose infants to obesity and metabolic disease. William Hansel Visiting Scientist Seminar Series, Pennington Biomedical Research Center, Baton Rouge, LA, September 2021.

9. Gestational obesity & offspring adiposity: How stress exposures in utero predispose infants to obesity and metabolic disease. East Carolina University Research Seminar, March 2022.

10. Infant Mesenchymal Stem Cells Inform Precision Approaches for Obesity Prevention. Center for Children's Healthy Lifestyles and Nutrition, the University of Kansas Medical Center, October 2023.

11. Making Visual Presentations: Branding, Accessibility, & Presenting Information. Talk Like Ted Lecture Series, University of Oklahoma Health Sciences Center, February 2024.

12. *Title TBD*. Colorado Diabetes Research Center, Diabetes Day Symposium. March 2024.

Local

1. Lipid Oxidation in Obesity: A Case for Metabolic Inflexibility. Diabetes and Obesity Research Seminar, East Carolina University, Greenville, NC. November 2007.

2. Measurement of Mitochondrial Function. Metabolism Interest Group Seminar, University of Colorado Anschutz Medical Campus, April 2010.

3. Metabolic Substrate Switching: Stories from Obese, Insulin Resistant, Skeletal Muscle Mitochondria. Metabolism and Diabetes Interest Group Seminar, University of Colorado Anschutz Medical Campus, September 2011.

4. Lipid Metabolism in Human Skeletal Muscle: Measuring Mitochondrial Function Using the Seahorse Metabolic Analyzer. Mucosal Inflammation Program, University of Colorado Anschutz Medical Campus, October 2012.

5. Maternal Programming of Fetal Stem Cells. Perinatal Research Conference, University of Colorado Anschutz Medical Campus, January 2013.

6. Maternal Programming of Fetal Stem Cells: How Obesity in Pregnancy Imparts Disease Risk in the Next Generation. Center for Women's Health Research Advisory Board Meeting, University of Colorado Anschutz Medical Campus, May 2013.

7. Maternal Obesity and Fetal Mesenchymal Stem Cell Differentiation. Pediatric Heart Lung Center, University of Colorado Anschutz Medical Campus, November 2014.

8. Maternal Programming of Fetal Stem Cells: How Obesity in Pregnancy Imparts Disease Risk in the Next Generation. Endocrine Research Conference, University of Colorado Anschutz Medical Campus, February 2015.

9. Maternal Programming of Fetal Stem Cells: How Obesity in Pregnancy Imparts Disease Risk in the Next Generation. LEAD Seminar Series, University of Colorado Anschutz Medical Campus, May 2015.

10. Mesenchymal Stem Cells: Clues for Understanding How Obesity in Pregnancy Impacts Offspring Adiposity. Pediatric Nutrition Seminar, University of Colorado Anschutz Medical Campus, June 2015.

11. Are Infants of Obese Mothers Programmed for Excess Adiposity and Metabolic Dysfunction?: A Mechanistic Approach. Endocrine Research Conference, University of Colorado Anschutz Medical Campus, September 2015.

12. Maternal Obesity and the Fetal Programming of Disordered Metabolism. Reproductive Sciences Seminar, University of Colorado Anschutz Medical Campus, October 2016.

13. Maternal Obesity Programs Deficits in Offspring Fatty Acid Oxidation. Perinatal-Neonatal Research Conference, University of Colorado Anschutz Medical Campus, November 2016.

14. Maternal Obesity and the Epigenetic Programming of Offspring Adiposity. Mucosal Inflammation Program, University of Colorado Anschutz Medical Campus, April 2017.

15. Maternal Obesity and Offspring Adipogenesis: Umbilical cord Mesenchymal Stem Cells. Maternal Fetal Medicine Research Series, University of Colorado Anschutz Medical Campus, November 2017.

16. Maternal Obesity and Offspring Adiposity. Basic & Translational Pediatric Research Seminar Series, University of Colorado Anschutz Medical Campus, January 2018.

17. Maternal Obesity and Offspring Fat Metabolism: Epigenetic Clues to Increased Obesity Risk. The Gates Center for Regenerative Medicine Seminar Series, University of Colorado Anschutz Medical Campus, March 2018.

18. Unravelling the Developmental Origins of Excess Adiposity: Umbilical Cord Mesenchymal Stem Cells. Cell Biology, Stem Cells, and Development Membership Seminar, University of Colorado Anschutz Medical Campus, May 2018.

19. Maternal Obesity and the Epigenetic Regulation of Offspring Adiposity. Perinatal-Neonatal Research Conference. University of Colorado Anschutz Medical Campus, November 2018.

20. Maternal Obesity and the Epigenetic Regulation of Offspring Adiposity. Integrated Physiology Seminar Series. University of Colorado Anschutz Medical Campus, December 2018.

21. MSC Metabolomics: Data Analysis for Deep Phenotyping. Exercise and Metabolism Meeting. University of Colorado Anschutz Medical Campus, January 2019.

22. Maternal Obesity: Pathways Leading to Offspring Obesity Risk. Barbara Davis Center Diabetes Day. University of Colorado Anschutz Medical Campus, March 2019.

23. What Makes a Phenotype: Maternal Obesity Induces Phenotypic Differences in Offspring MSCs. Department of Pediatrics Basic & Translational Research Seminar. University of Colorado Anschutz Medical Campus, March 2019.

24. Maternal Obesity and the Epigenetic Regulation of Offspring Obesity/Diabetes Risk. University of Colorado AMC Cells, Stem Cells, & Development Graduate Program Retreat. Breckenridge, CO. October 2019.

25. Mechanisms for Metabolic Disease Risk in Infants Born to Mothers with Obesity. University of Colorado Pediatric Nutrition Seminar Series, Anschutz Medical Campus, Aurora, CO. February 2020.

26. Determining Infant Risk for Developing Obesity and Diabetes. University of Colorado Center for Women's Health Research Community Engagement, Anschutz Medical Campus, Aurora, CO. July 2020.

27. Gestational Metabolic Stress and the Epigenetic Regulation of Myocyte Metabolism. University of Colorado Endocrine Research Conference, Anschutz Medical Campus, Aurora, CO. April 2022.

28. Gestational Metabolic Stress and the Epigenetic Regulation of Myogenic Metabolism. Endocrine Research Conference. Anschutz Medical Campus, April 2022.

29. Infant Mesenchymal Stem Cells Link Gestational Stress to Child Metabolic Health Outcomes. Children's Hospital Colorado Child Health Research Internship Friday Chalk Talk, July 2022.

30. Exploring Adipogenesis in Human Progenitor Cells. Perinatal Research Center Seminar. Anschutz Medical Campus, November 2022.

31. Visual Presentations: Branding and Data Presentation in Powerpoint. Perinatal Research Center Fellow Presentation. Anschutz Medical Campus, November 2022.

32. Cell Cycle Exit & Lineage Specification in Human Infant Mesenchymal Stem Cells, Reproductive Sciences Seminar. Anschutz Medical Campus, January 2023.

Conference Abstracts – Oral Presentations

International

1. **Boyle KE**, Zheng D, Anderson EJ, Neufer PD, and Houmard JA. Mitochondrial function is impaired in cultured myotubes from obese humans. International Biochemistry of Exercise Conference, University of Guelph, Ontario, Canada, June 2009.

2. **Boyle KE**, Patinkin ZW, Shapiro ALB, Vanderlinden L, Kechris K, Dabelea D, & Friedman JE. DNA hypermethylation of metabolic genes corresponds to lower fatty acid oxidation in mesenchymal stem cells from infants of obese mothers: The Healthy Start BabyBUMP Project. *2016 Obesity and Adipose Tissue Biology, Keystone Symposia, Banff, Alberta, Canada.*

3. Waldrop SW, Niemiec S, Wood C, Gyllenhammer LE, Jansson T, Friedman JE, Borengasser SJ, Yang IV, Kechris K, Dabelea D, and **Boyle KE**. Infant cord blood DNA methylation is associated with maternal triglycerides and child adiposity through 4-6 years of age. Society for Reproductive Investigation Annual Meeting 2023, Brisbane Australia.

National

1. **Boyle KE**, Thuma JR, and Loucks AB. Short-term effects of low energy availability on ghrelin reflect effects on body size, not leptin or insulin. 2003 American College of Sports Medicine 50th Annual Meeting, San Francisco, CA.

2. **Boyle KE**, Hwang H, DeVente JM, Barbour L, Hernandez T, Bowen B, Zhengping Y, Mandarino LJ, and Friedman JE. Quantitative Proteomic Profile in Skeletal Muscle from Women with Gestational Diabetes Reveals Potential for Reduced Mitochondrial Function, 2010 American Diabetes Association 70th Scientific Sessions, Orlando, FL.

3. **Boyle KE**, Heerwagen MJ, and Friedman JE. Transgenic mice enriched for omega-3 fatty acids show improved skeletal muscle mitochondrial fuel switching in response to high-fat diet. August

2011, FASEB Summer Research Conference: Nutrient Control of Metabolism and Cell Signaling, Steamboat Springs, CO.

4. **Boyle KE**, Patinkin Z, Shapiro ALB, Dabelea D, Friedman JE. Human mesenchymal stem cells from offspring of obese mothers have increased adipogenesis and evidence for insulin resistance: The Healthy Start Study. *2015 American Diabetes Association 75th Scientific Sessions, Boston, MA.* ***President's Oral Sessions.***

5. **Boyle KE**, Patinkin ZW, Shapiro ALB, Baker PR II, Dabelea D, Friedman JE. Disrupted GSK-3β/β-catenin signaling induces greater adipogenesis in mesenchymal stem cells derived from babies of obese women: The Healthy Start BabyBUMP Project. *2015 The Obesity Society ObesityWeek 2015, Los Angeles, CA.*

6. **Boyle KE**, Patinkin ZW, Shapiro ALB, Yang I, Davidson B, Vanderlinden L, Kechris K, Dabelea D, & Friedman JE. DNA Hypermethylation Corresponds to Differences in Metabolism and Cellular Differentiation in Mesenchymal Stem Cells from Infants Born to Obese Mothers: The Healthy Start BabyBUMP Project. *2016 American Diabetes Association 76th Scientific Sessions, New Orleans, LA.*

7. Keleher M, Shubhangi S, Brown A, Duensing A, Dabelea D, and **Boyle KE**. Maternal Obesity Linked to Hypertrophy in Adipogenic Infant MSCs: The Healthy Start ECHO Cohort 2019 The Obesity Society ObesityWeek 2019, Las Vegas, NV.

MEDIA

1. Endocrine News, "Obesity's Impact on mRNA in Skeletal Muscle". January 2011.

2. TIME Magazine, "How Obese Moms May Wire Kids for Obesity". June 9, 2015.

3. The Denver Post, "Obese Moms Program Offspring for Obesity and Metabolic Disease". June 12, 2015.

4. CBS, Channel 4: "Diabetes Study Tracks New Moms, Children: Colorado Researchers Look at what Causes Obesity". This interview focused on our research identifying greater adipogenesis in mesenchymal stem cells from infants of obese versus normal weight mothers. 2015.

5. Medpage Today: "Some Babies Get a Bad Start on Obesity Risk From Mom". November 2021.

DIDACTIC TEACHING

Course Development

Full Courses

2003-2005 — *Ohio University, Athens, OH*
BIOS 3450: Human Physiology Laboratory (2.0 credit hours)
25-30 undergraduate students. Developed and implemented course structure including lecture, lab practicum, and exams. Assessed and administered all grades.

2003-2005 — *Ohio University, Athens, OH*
BIOS 4150: Exercise Physiology Laboratory (2.0 credit hours)
25-30 undergraduate students. Developed and implemented course structure including lecture, lab practicum, and exams. Assessed and administered all grades.

2006 — *East Carolina University, Greenville, NC*
EXSS 3805: Physiology of Exercise (3.0 credit hours)

60-70 undergraduate students. Developed and implemented course structure including lecture, syllabus, and exams. Assessed and administered all grades.

2013-2016 *University of Colorado Anschutz Medical Campus, Aurora, CO*
IDPT 7823/7809: Biomedical Sciences Core Course III: Systems Biology of Energetics
Lecture Topic: Regulation of Cellular Metabolism. 50-60 graduate students. Lecture topics included anabolic and catabolic metabolism and the control of these systems by substrate availability, energetic demand, and oxygen availability. Methodology for measuring metabolism in cells and tissues. Includes selection and instruction for guided readings, quiz and exam preparation/grading (1 x 2 hour lecture/year, research article discussion).

2017 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Journal Club Core Director: Pediatrics, Nutrition Section
Lecture Topic: Adipose Tissue Expansion and Metabolic Health. 10-15 students, post-docs, and faculty members. Selected topic and developed lecture, led discussion (2 x 1 hr lectures).

2020-2022 *University of Colorado Anschutz Medical Campus, Aurora, CO*
CSDV 7606: Critical Analysis of Research in Cell Biology, Stem Cells and Development
Lecture Topic: Cell/Environment Interplay (1 block of 4). 6-8 graduate students. First-year graduate students will learn to critically evaluate scientific literature in preparation for writing and critiquing research grant proposals. Each session concludes with written mini-proposals and peer critiques.

Guest Lectures

2003 *Ohio University, Athens, OH*
BIOS 4500/5500: Principles of Endocrinology
25-30 undergraduate and graduate students. Developed and taught lecture on topics including growth hormone and IGF function, hypothalamic-pituitary-IGF axis, normal and abnormal growth patterns, pathology and treatment

2010-2012 *Metro State University, Denver, CO*
NUT 3400: Nutrition and Weight Management
30-35 undergraduate students. Developed and taught lecture on topics including obesity in pregnancy, gestational diabetes and epigenetic modification (2 x 1 hr lectures/semester).

2011 *Colorado School of Public Health MPH Program, Aurora, CO*
CBHS 6623: Nutrition in Global Community
20-25 graduate students. Developed and taught lecture on topics including obesity in pregnancy, gestational diabetes and epigenetic modification.

2015 *Colorado State University, Fort Collins, CO*
FSHN 750: Nutrition Pathophysiology
25-30 graduate students. Developed and taught lecture on topics including mechanisms of metabolic fetal programming and epigenetics.

2015, 2019 *University of Colorado Graduate School, Aurora, CO*
RSPC 7801: Molecular Mechanisms of Reproductive Endocrinology and Metabolism
10 graduate students. Developed and taught lecture on topics including lipid metabolism in reproduction and fetal programming.

CAREER DEVELOPMENT LEADERSHIP

2014 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Assisted: Respite/Wellness Seminar (1 hr seminar)
25-30 junior faculty members. Hosted by the Department of Pediatrics Junior Faculty Interest Group. Developed format, invited expert speaker.

2016 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Assisted: Bi-Annual Zoo Retreat (half-day retreat)
40-50 junior faculty members. Hosted by the Department of Pediatrics Junior Faculty Interest Group. Developed format, invited speakers, hosted event. Topics included promotion readiness, lab and personnel management, work-life balance, and time management.

2017 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Co-Lead: How to Network (1 hr panel discussion)
25-30 junior faculty members. Hosted by the Department of Pediatrics Junior Faculty Interest Group. Developed format, invited expert panel members, facilitated discussion.

2018 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Co-Lead: Annual Pediatric Nutrition Faculty Retreat (full-day retreat)
25 faculty members. Hosted by the Department of Pediatrics, Section of Nutrition. Developed format, invited speakers, facilitated catering, hosted event. The theme was "Team Science", with outside speakers, panel discussion, and team building events focused on this topic. Fellows and faculty presented research.

2018 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Co-Lead: Research Finance 101 (1 hr seminar)
30-40 junior faculty members. A joint event hosted by the Department of Pediatrics Junior Faculty and PhD Faculty Interest Groups. Developed format, invited speakers, hosted event. Topics included budgeting for grants, managing finances post-award, and a panel discussion with local research, grants management, and center director experts.

2018 *University of Colorado Anschutz Medical Campus, Aurora, CO*
Co-Lead: Bi-Annual Zoo Retreat (half-day retreat)
40-50 junior faculty members. Hosted by the Department of Pediatrics Junior Faculty Interest Group. Developed format, invited speakers, hosted event. Topics Included promotion and tenure, wellness, and lab management.

2021 *American Society for Nutrition Annual Meeting, Virtual*
Co-Lead: Grant Writing Training Academy (1.5 hr discussion)
65-75 ASN members attended virtually, 80% early career researchers. Hosted by the Maternal, Perinatal and Pediatric Research Interest Section. Developed format, invited speakers, hosted event. This was a panel discussion and interview of three recent recipients of NIH Training Awards (F32, K01).

2022 *American Society for Nutrition Annual Meeting, Virtual*
Co-Lead: Nature through Nurture: Prenatal and Postnatal Contributors to Childhood Obesity Development (1.5 hr Seminar and discussion)
80-95 ASN members attended virtually. Hosted by the Maternal, Perinatal and Pediatric Research Interest Section. Developed format, invited speakers, hosted event. This was scientific presentation and panel discussion from three experts in the developmental predisposition for obesity.

2023 *American Society for Nutrition Annual Meeting, Boston, MA*
Lead: Speed Networking: Making Connections in the field of Maternal, Perinatal, and Pediatric Nutrition (1.5 hr Seminar and small group networking)
60 ASN members attended in-person. Hosted by the Maternal, Perinatal and Pediatric Research Interest Section. Developed format, invited experts, hosted event. This was guided networking session to facilitate interaction and discussion among early career and established experts in the area of pregnancy and pediatric nutrition. Topics included the double burden of malnutrition, nutrition and mental health in pregnancy, prenatal influences on childhood obesity risk.

TRAINING & MENTORING

Faculty

2022-Present **Lauren Gyllenhammer, PhD, University of California, Irvine**
Lauren is an Assistant Professor at University of California Irvine who is funded on a K99/R00. Lauren studies maternal stress during pregnancy and the impact on offspring body composition. I have been mentoring Lauren as she transitions into her faculty position using the umbilical cord stem cell model we use in our lab.

Role: Co-Mentor: Cell Culture & Metabolism Mentor

Project: Synergistic effect of maternal insulin-resistance and cortisol in pregnancy on fetal programming of child mitochondrial function and obesity risk.

Mentee Accomplishments:
- Co-first authorship on 1 original research articles with my group,1 co-authorship with my group, and 2 first author manuscripts currently in preparation with my group.
- Received an NIH ECHO Opportunities and Infrastructure Fund project grant (08/2021)

2018-Present **Vincent Zaegel, PhD, University of Colorado School of Medicine**
Vincent is Senior Researcher in my lab at CU Anschutz. Vincent began as a research technician and has recently been promoted to a faculty-level position. Vincent studies the regulation of mitochondrial function using various molecular biology techniques. I have been mentoring Vincent on the developmental origins of metabolic disease through several ongoing projects in our lab using the umbilical cord stem cell model.

Role: Primary Mentor

Project: The role of succinate dehydrogenase in regulating intrinsic differences in infant mesenchymal stem cell electron transport and H_2O_2 emission.

Mentee Accomplishments:
- Co-authorship on 1 original research articles with 3 more currently in preparation.
- Currently drafting first-author manuscript focused on the role of *SDHC* in infant mesenchymal stem cell metabolism.

Postdoctoral Fellows

2018-2021 **Madeline Keleher, PhD University of Colorado School of Medicine**
Madeline was a postdoctoral fellow in my laboratory. I mentored her in the use of our primary umbilical cord stem cell model, experimental design for *in vitro* mechanistic investigation, project development, manuscript writing, and grantsmanship.

Role: Primary Mentor

Education: Madeline earned her PhD in Biology from Washington University in St. Louis (2017) investigating offspring epigenetic effects of maternal obesity in a mouse model.

Project: Maternal obesity impacts infant stem cell adipogenesis and insulin sensitivity.

Mentee Accomplishments:
- Applied to NIH F32 08/2018
- Published 2 first author manuscripts
- Took 9-mo leave to pursue teaching interests
- Currently a medical writer at Oxford Pharmagenesis

2017-2019 **Nicholas Broskey, PhD, Pennington Biomedical Research Center**
Nick is a post-doctoral fellow at the Pennington Biomedical Research Center under the primary mentorship of Leanne Redman, PhD. I have been mentoring Nick on career development and mesenchymal stem cell differentiation and metabolism by phone and in person since 2017. Nick will visit my lab in fall 2018 to learn hands-on techniques unique to my lab. For this role I am listed as a collaborator on Nick's recent American Diabetes Association Pathway Accelerator grant application (highly competitive, high risk/high reward), which will fast-track his transition to junior faculty.

Role: Co-Mentor: Cell Culture & Metabolism Mentor

Project: Intergenerational inheritance of Type 2 diabetes: How exercise in pregnancy affects infant metabolism in mothers at risk for developing diabetes

Mentee Accomplishments:
- Received a Louisiana NORC Pilot award to complete his post-doctoral research project in 11/2017
- Currently an Assistant Professor at East Carolina University
- ESI R01 Application scored 24th percentile, likely to be funded.

2021-2023 **Carmen Ortega-Santos, PhD University of Colorado School of Medicine**
Carmen is a postdoctoral fellow at the University of Colorado under the primary mentorship of Audrey Bergouignan, PhD. I will mentor Carmen on mechanistic and *in vitro* metabolic investigations using primary stem cells obtained from the human participants in their ongoing clinical research projects.

Role: Co-Mentor: Cell Culture & Metabolism Mentor

Project: Impact of sedentary behavior and physical activity on metabolic flexibility in pre-diabetic population.

Mentee Accomplishments:
- Supported by NIH T32 Fellowship in the Department of Endocrinology Metabolism and Diabetes
- Is currently an Assistant Professor at George Washington University

2021-Present **Manoel Lixandrão, PhD University of Colorado School of Medicine**
Manoel is a postdoctoral fellow in my laboratory. I mentor him in the use of our primary umbilical cord stem cell model, experimental design for *in vitro* mechanistic investigation, project development, manuscript writing, and grantsmanship.

Role: Primary Mentor

Project: The effects of epigenetics on glucose and oxidative metabolic plasticity across the lifespan.

- 1 co-authored manuscript accepted to *Obesity*
- 2 first-author manuscripts in preparation

- 2 National abstracts submitted, 1 poster presentation, 1 selected for oral presentation and awarded as a top-scoring abstract for competition.

2022-2023 **Stephanie Waldrop, MD, University of Colorado School of Medicine**
Stephanie is a physician and postdoctoral fellow, on the T32 fellowship in the Section of Nutrition. I am mentoring her through data interpretation and manuscript writing for a large-scale epigenomics study with my group.

Role: Co-Mentor

Project: Cord blood DNA methylation of immune and lipid metabolism genes is associated with maternal triglycerides and child adiposity.

- 1 first-author manuscript accepted with my group
- 1 National & 1 International abstract submitted/presented with my group.

2023-Present **Anthony Wang, MD, PhD, University of Colorado School of Medicine**
Anthony is a physician and postdoctoral fellow on the T32 fellowship in the Section of Nutrition. I am mentoring him through career development as he completes his T32 project aimed at investigating genetic and epigenetic pathways contributing to liver fat content in children from the Healthy Start Study.

Role: Co-Primary Mentor

Project: Perinatal exposures and offspring hepatic fat accumulation.

Graduate & Medical Students

2012-2015 **Allison Shapiro, PhD, Colorado School of Public Health**
Allison was a PhD student in Epidemiology at the Colorado School of Public Health under the primary mentorship of Dana Dabelea, MD, PhD. I mentored Allison basic cell culture techniques, primary mesenchymal stem cell differentiation and metabolism.

Role: Cell Culture & Metabolism Mentor

Project: Investigating the mediating role of Sirtuin 1 and PPAR-γ in the relationship between maternal dietary niacin intake and infant adiposity.

Mentee Accomplishments:
- First author on 1 original research article, co-authorship on 3 original research articles
- First author on 2 abstracts, co-authorship on over 10 abstracts
- Received PhD degree in December 2015
- Currently an Assistant Professor in the University of Colorado Department of Pediatrics, Endocrinology Section.

2014-2016 **Zachary Patinkin, MD, MPH, Colorado School of Public Health**
Zachary worked in my lab while pursuing a Master's degree in Public Health. I mentored Zachary in laboratory techniques, including sterile cell culture techniques, protein assessments, and metabolism. I also mentored Zachary on hypothesis generation, experimental design, manuscript drafting, and publication of results.

Role: Primary Research Mentor/Supervisor

Project: Human Mesenchymal Stem Cells and the Epigenetic Programming of Obesity

Mentee Accomplishments:
- Co-authorship on 6 original research articles.
- Co-authorship on over 10 abstracts

- Graduated Netter School of Medicine at Quinnipiac University, 2019

2018-2021 **Nathan De Jong, PhD Colorado State University**
Nathan was a PhD student at the University of Colorado under the primary mentorship of Audrey Bergouignan, PhD. I mentored Nathan on mechanistic and *in vitro* metabolic investigations using primary stem cells obtained from the human subjects in his clinical research project.

Role: Co-Mentor: Basic Science Research Mentor

Project: Metabolic effects of breaking up sedentary time

Mentee Accomplishments:
- Has received a TL1 Pre-Doctoral Fellowship from the Colorado Clinical and Translational Sciences Program
- Successfully defended his dissertation Dec 2021
- Postdoctoral fellowship at Florida State University

2020-2022 **Alec Chaves, PhD East Carolina University**
Alec was a PhD student at the University of Colorado under the primary mentorship of Joseph Houmard, PhD. I mentored Alec on the use of human, umbilical cord mesenchymal stem cells. This involved help with troubleshooting the set-up of the stem cell cultures at ECU, assistance with study design and data interpretation, and manuscript editing.

*Role: Co-Mentor: U*mbilical cord MSC Research Mentor

Project: Metabolic effects of breaking up sedentary time

Mentee Accomplishments:
- Published 1 first-author manuscript with my group
- Successfully defended his dissertation 2022
- Postdoctoral fellowship at Duke University

2022-Present **Suzanna Kafer, University of Colorado Graduate School**
Suzanna is a PhD Candidate at the University of Colorado in the Integrated Physiology Program. I am Suzzi's primary mentor and her research focuses on mechanistic and *in vitro* metabolic investigations testing the role of maternal biological stress on infant mitochondrial outcomes using umbilical cord-derived stem cells derived from human infants.

Role: Primary Mentor

Project: Maternal stress and offspring mitochondrial metabolism

Mentee Accomplishments:
- Suzzi passed her comprehensive exam in October, 2023
- Suzzi is currently drafting a manuscript focused on perfluoroalkyl and polyfluoroalkyl substances exposures during gestation and the effects on infant stem cell outcomes.

2023-Present **Kavya John, Paul L. Foster School of Medicine at Texas Tech University**
Kavya is an M.D Candidate at the Paul L. Foster School of Medicine. I mentored Kavya in Summer 2023 for her Child Health Research Internship at Children's Hospital Colorado. Kavya is continuing her project remotely, for which she will earn co-first authorship. I am also Kavya's mentor for her Scholar Academic Research Project at her home institution, based on her summer research project.

Role: Primary Mentor

Project: Perfluoroalkyl and polyfluoroalkyl substances exposures during gestation and the effects on infant stem cell outcomes

Mentee Accomplishments:

- Kavya presented her internship results to her internship program, and completed a written document and presentation on these results for her home institution.
- Kavya is currently drafting a manuscript focused on perfluoroalkyl and polyfluoroalkyl substances exposures during gestation and the effects on infant stem cell outcomes.

High School Student Interns (Primary Mentor)

Student	*Current Institution*	*Year*
Phoebe Barr	n/a	2016 Summer
Allison Brookhart	Univ. California Los Angeles	2022 Summer
Shreya Shubhangi	Stanford University	2018 - 2019

Undergraduate Student Interns (Primary Mentor)

Student	*Current/Degree Institution*	*Year*
John Davy	Univ. Virginia School of Medicine, 2018	2012 Summer
Reily Quist	Univ. Colorado School of Medicine, 2022	2015 - 2017
Medrine Kahanga	Earlham College	2022 Summer
Taylor LaValley	Miami University	2023 Summer
Vrushali Patel	University of Colorado Boulder	2023-Present

Graduate Student Interns (Primary Mentor)

Student	*Home Institution*	*Year*
Asya Brown	Regis University	2018 - 2019
Lillian Svete	Univ. Colorado School of Medicine, 2021	2018 - 2019
Lauren Blea	Regis University	2019 - 2020
Samantha Landgrave	Univ. Colorado Graduate School	2020
Katie McDermott	Regis University	2021 - 2022
Nica Selin	Regis University	2022 - 2023

Graduate Student Thesis Committee Member

Student (deg.)	*Advisor*	*Years*
Esteban Lucero (PhD)	Huntington Potter, PhD	2016 - 2021
Diane Gumina (PhD)	Emily Su, MD	2019 - 2022
Rosemary McDonald (PhD)	Raj Kumar, PhD	2019 - 2023
Arely Diaz (PhD)	Tânia Reis, PhD	2020 - Present
Karli Swenson, (PhD)	Emily Bates, PhD	2020 - 2023
Darcy Kahn (PhD)	Bryan Bergman, PhD	2021 - 2022
Nicholas Hulett (PhD)	Jane Reusch	2021 - Present
Francesca Cendali (PhD)	Angelo D'Alessandro, PhD	2023 - Present
Grissy Simé Mora (PhD)	Josiane Broussard, PhD	2023 - Present

Postdoctoral Fellow Committee Member

Fellow	*Advisor*	*Years*
Jerad Dumolt, PhD	Theresa Powell, PhD, Thomas Jansson, MD, PhD	2021 - Present
Colleen McKenna, PhD	Bryan Bergman, PhD	2022 - Present
Tyler Cook, PhD	Darleen Sandoval, PhD	2023 - Present
Molly McGuckin, PhD	Stephanie Wesolowski, PhD	2023 - Present

RESEARCH EXPERTISE & GOALS

I have a robust foundation in obesity research, with 18 years dedicated to identifying and understanding metabolic phenotypes in primary human stem cells. The following sections highlight my work in this area. My research expertise spans mitochondrial physiology, epigenetics, metabolism, endocrinology, exercise physiology, and nutrition. I have had continuous funding from the NIH since beginning my postdoctoral fellowship 14 years ago. My current research program aims to understand how fetal exposures predispose infants to metabolic disease later in life. In pursuit of this goal, my lab pioneered the use of mesenchymal stem cells collected from umbilical cord tissue of newborn infants to investigate molecular and metabolic phenotypes predictive of future disease risk. Such tools have allowed us to identify children most at risk for excess adiposity in childhood with greater precision than other common measures collected at birth. As we move toward precision approaches for obesity prevention, infant stem cells will help to identify gestational exposures most impactful, and their modifiability through pregnancy interventions, thereby informing evidence-based prenatal clinical care.

GRANT SUPPORT

Active *(3 as Principal Investigator, 3 as Co-Investigator)*

2018-2024

NIH R01 DK 117168
Role: Principal Investigator

Epigenetic programming of infant mesenchymal stem cells: mechanisms for obesity and diabetes risk in humans

The goal of this project is to determine the epigenetic mechanisms for perturbations in lipid metabolism of umbilical cord-derived mesenchymal stem cells from infant of obese versus normal weight mothers.

$1,677,087 total

2021-2026

NIH R01 HD 102726
Role: Co-Investigator

Principal Investigators: Lynn A. Barbour, MD; Teri L. Hernandez, PhD, RN

Triglycerides as a Predictor of Newborn Subcutaneous and Liver Fat: Contributors to Fetal Fat Accretion in Obese Pregnancies

The goal of this project is to determine the predictive power of maternal triglycerides in fetal subcutaneous and liver fat. Pregnant women with overweight or obesity will be included and placental transport of lipids, cord blood lipidomics, and infant adiposity and infant-derived stem cell adipogenesis will be measured.

$3,255,123 total

2022-2024

Diabetes Research Center, Anschutz Medical Campus
Role: Co-Investigator

Principal Investigator: Emily Bates

Determining the effect of in utero CBD exposure on eating behaviors, obesity, and insulin resistance.

Cannabidiol consumption is increasing nationally among the general population and among pregnant women specifically, which could increase child obesity and later life diabetes risk. Yet very little is known about the offspring health risks of prenatal cannabidiol use. The goal of this pilot project is to determine whether and how prenatal cannabidiol exposure increases offspring obesity and metabolic disease in mice.

$100,000 total

2022-2027 **NIH R01 HD 107176**
Role: Co-Principal Investigator
Principal Investigators: Kristen Boyle, PhD; Sonja Entringer, PhD; Pathik Wadhwa, PhD
Stress and Human Stem/Progenitor Cells: Biobehavioral Mechanisms

The goal of this project is to test hypotheses related to the role of maternal stress in fetal programming of the integrity of telomere and mitochondrial function in human progenitor/stem cells, and its clinical relevance for newborn phenotypes.

$3,300,212 total

2022-2027 **NIH R01 NIMHD 017387**
Role: Co-Principal Investigator
Principal Investigators: Kristen Boyle, PhD; Sonja Entringer, PhD; Pathik Wadhwa, PhD
Biological Embedding of Social Disadvantage in Human Stem Cells: Implications for Health Disparities

The goal of this project is to test the impact of maternal exposure to social disadvantage during pregnancy on offspring mesenchymal progenitor/stem cells, newborn body composition, and glucose-insulin regulation.

$3,092,789 total

2024-2028 **NIH R01 NIDDK**
Role: Co-Investigator
Principal Investigator: Nicholas Broskey, PhD
Effect of Maternal Exercise in Women with Obesity on Offspring Mesenchymal Stem Cell Metabolism

The goal of this proposal is to leverage our recently funded randomized controlled trial to determine if aerobic or resistance exercise during pregnancy in women with pre-existing obesity, affect infant mesenchymal stem cell metabolism in a manner that represents a reduction in risk for obesity in the infant.

$2,546,260 total

Completed *(7 as Principal Investigator, 2 as Co-Investigator, 2 training fellowships)*

Extramural

2016-2023 **NIH, 1UG3OD023248-01**
Role: Co-Investigator
Environmental Influences on Child Health Outcomes
Principal Investigator: Dana Dabelea, MD, PhD
The Early Life Exposome and Childhood Health – The Colorado Healthy Start 3 Cohort Study. The goal of this project is to estimate the early life "exposome", across a wide range of exposures (social, metabolic, chemical, physical), and conduct integrative analyses of early life exposure related to child health outcomes that are informed by molecular biomarkers ('omics) and pathways.

2018-2021 **American Diabetes Association CORE #1-18-ICTS-016**
Role: Principal Investigator
Umbilical cord-derived stem cell metabolism: Understanding mechanisms for childhood obesity risk

The goal of this project is to comprehensively interrogate umbilical cord-derived mesenchymal stem cell response to metabolic stress, such as glucose starvation or excess fat exposure, to determine the role of stem cell metabolic outcomes as predictors of child metabolic health outcomes.

$545,321 direct costs ($600,000 total)

2015-2019 **NIH K01 DK106347**
Role: Principal Investigator

Human Mesenchymal Stem Cells and the Epigenetic Programming of Obesity.

This is a mentored research scientist career development award. The goal of this project is to identify epigenetic signatures related to differences in mesenchymal stem cell differentiation and metabolism based on mother's obesity status, that may give insight into the developmental programming of neonatal adiposity.

$368,227 direct costs ($397,687 total)

2016-2018 **P30GM118430-RedmanPF-01**
Role: Co-Investigator

IMAGINE COBRE Pilot
Investigation of the mechanisms for transmission of impaired glucose metabolism in infants exposed to diabetes in utero

Principal Investigator: Leanne M. Redman, PhD

The goal of this project is to test the hypothesis that *in utero* exposure to maternal substrate oxidation and placental lipotoxicity, characteristics of diabetic pregnancy, programs a metabolically inflexible phenotype in the offspring as measured by infant substrate oxidation and metabolism in umbilical cord derived mesenchymal stem cells from the infants.

$14,857 direct costs (sub-award)

2011-2012 **NIH F32 DK 089743**
Role: Principal Investigator

Cellular Mechanisms for Insulin Resistance in Human Gestational Diabetes Mellitus

The F32 award provides support for promising postdoctoral scholars who have the potential to become productive, independent investigators within the broad scope of biomedical, behavioral, or clinical research. The goal of this project is to investigate the role of skeletal muscle metabolism on the etiology of insulin resistance in women with gestational diabetes mellitus.

$97,264 direct costs (no indirect costs)

2013-2014 **The Obesity Society Early Career Research Grant**
Role: Principal Investigator

The Effect of Maternal Obesity on Skeletal Muscle Cell Differentiation

The goal of this project is to explore molecular pathways whereby fetal exposure to maternal obesity contribute to adiposity at birth and longitudinally at 5 months of life by measuring epigenetic modification of fetal mesenchymal stem cells.

$25,000 direct costs, no indirect costs

Intramural

2009-2010 **NIH T32 DK 007658**
Role: Postdoctoral Fellow

Principal Investigator: Nancy F. Krebs, MD

The primary goal of this training program in Nutrition is to train the next generation of physician scientists and basic researchers who are committed to the prevention of disease and health promotion through careers in human nutrition.

No Direct Costs

2013-2015 **NIH K12 HD 057022**
Role: Research Scholar
Principal Investigator: Judith G. Regensteiner, PhD
The Colorado Building Interdisciplinary Research Careers in Women's Health Program (BIRCWH)

The BIRCWH Award is a mentored career development award that connects junior faculty to senior faculty with shared interest in women's health and sex difference research with the goal of creating a pathway to independent research funding for the junior faculty in the field of women's health research. Application Title: Maternal Programming of Fetal Stem Cells.

No Direct Costs

2014-2015 **BERD Seed Program Grant**
Role: Principal Investigator
The Colorado Clinical & Translational Sciences Institute (UL1 TR001082)
Mesenchymal Stem Cells and the Epigenetic Programming of Neonatal Adiposity

This program offers one time funds to offset the cost of biostatistical consulting for junior faculty at the University of Colorado.

$1,000 direct costs, no indirect costs

2014-2015 **Center for Women's Health Research, Research Development Award**
Role: Principal Investigator
Mesenchymal Stem Cells and the Epigenetic Programming of Neonatal Adiposity

This grant is awarded to exceptional junior faculty members for the conduct of research focused in areas that will help improve the diagnosis, treatment, or management of cardiovascular disease and/or diabetes in women. The goal of this project is to identify differences in mesenchymal stem cell adipogenesis, based on mother's obesity status, that potentially contribute to the developmental programming of neonatal adiposity.

$25,000 direct costs, no indirect costs

2021-2022 **Colorado CTSI**
Role: Co-Principal Investigator

Principal Investigators: Kristen Boyle, PhD; Josianne Broussard, PhD

Impact of weight loss on the intrinsic circadian clock in human skeletal muscle

The goal of this pilot project is to determine whether circadian rhythm impairment is related to insulin sensitivity, and whether circadian rhythms can be improved with interventions such as weight loss and/or exercise.

$60,000 total

Pending *(4 as Principal Investigator, 1 as Co-Investigator)*

Extramural

Submitted Oct. 2023 **NIH U01 NIDDK**
Role: Co-Investigator

Principal Investigator: Kechris, Lange, Yang, Perng

Subtyping COre for Research on the Etiology of Type 2 Diabetes (SCORE-T2D)

The goal of this proposal is to develop a Biostatistics Research Center that is focused on subtyping type 2 diabetes. I will provide expertise in expertise in integration of 'omics data into molecular and mechanistic studies of obesity and type 2 diabetes.

Submitted Oct. 2023

NIH R01 NIDDK
Role: Co-Principal Investigator

Principal Investigators: Emily Bates, PhD; Kristen Boyle, PhD

Determining how in utero CBD exposure affects offspring insulin resistance.

Many women take cannabidiol (CBD) during pregnancy to help with nausea, and they believe it to be safe for them and their baby, yet little is known about the long-term consequences of gestational CBD exposure. The goal of this study goal is to determine how glucose tolerance, insulin resistance, and peripheral tissue metabolism are affected by fetal CBD exposure.

Submitted Jul. 2023

NIH R01 NIDDK
Role: Principal Investigator

Principal Investigator: Kristen E. Boyle, PhD

Adipocyte Hypertrophy in Infant Mesenchymal Stem Cells, Inflammatory and Metabolic Consequences.

The *goal* of this project is to determine molecular pathways and potential immune and metabolic consequences of proliferation and hypertrophy in infant MSC adipogenesis. We propose three aims to address our central hypothesis that early cell cycle exit in MSC adipogenesis reduces cell number; adipocyte hypertrophy ensues, but disruption to inflammatory and metabolic systems are themselves intrinsic, not dependent on hypertrophy.

Submitted Jul. 2023

NIH R01 NIEHS
Role: Co-Principal Investigator

Principal Investigators: Anne Starling, PhD; Kristen E. Boyle, PhD

Prenatal PFAS exposure and child risk for obesity and metabolic disruption.

The goal of this project is to determine whether maternal exposure to persistent organic pollutants is associated with child adiposity and metabolic health outcomes. In addition, this project will determine whether DNA methylation outcomes are mechanistically linked to phenotypic adiposity outcomes using primary umbilical cord-derived mesenchymal stem cells.

Submitted Jul. 2023

NIH R01 NIDDK
Role: Co-Principal Investigator

Principal Investigators: Kristen Boyle, PhD; Suzanne Phelan, PhD; Leanne M. Redman, PhD

Effect of the Maternal Milieu on Offspring Metabolic Phenotype

This project is ancillary to a newly funded randomized controlled feeding study that will maintain maternal weight during pregnancy in women with obesity. The goal of this ancillary project is to determine what factors in the maternal milieu predict infant obesity-related outcomes, including epigenetic and metabolic molecular phenotypes. Results from this study will determine whether maternal lifestyle intervention, exclusively in women with obesity, will improve offspring obesity risk.

PUBLICATIONS

- 48 peer-reviewed publications, 28 since last promotion, 16 as first-author or senior author
- >3,000 citations, with >1,900 in Thompson Reuters-indexed journals
- *h*-index: 16 (Google Scholar = 17)
- underline indicates mentee

Peer-Reviewed

1. Berggren JR, **Boyle KE**, Chapman WH, Houmard JA. Skeletal muscle lipid oxidation and obesity: influence of weight loss and exercise. *Am J Physiol Endocrinol Metab*, *294*(*4*):*E726-32*, 2008. PMID: 18252891.

2. Hittel DS, Berggren JR, Shearer J, **Boyle KE**, and Houmard JA. Increased secretion and expression of myostatin in skeletal muscle from extremely obese women. *Diabetes*, *58(1):30-8*, 2009. PMID: 18835929.

3. Anderson EJ, Conniff ME, **Boyle KE**, Woodlief TL, Kane DA, Price III JW, Ravinovitch PS, Szeto HH, Houmard JA, Cortright RN, Wasserman DH, and Neufer PD. Mitochondrial H_2O_2 emission and cellular redox state link excess fat intake to insulin resistance. *J Clin Invest*, 119(3):573-581, 2009. PMID: 19188683. ***Web of Science: Top Cited in the Field*.

4. Howe HR III, Heidal K, Choi MD, Kraus RM, **Boyle KE**, and Hickner RC. Increased adipose tissue lipolysis after a 2-week high-fat diet in sedentary overweight/obese men. *Metabolism*, 60(7):976-81, 2011. PMID: 21040937.

5. **Boyle KE** and Friedman JE. Maternal obesity and oxidative stress in the fetus: Mechanisms underlying early life shifts in skeletal muscle metabolism. *Fetal Matern Med Rev* 22:219–246, 2011. *Review*.

6. **Boyle KE**[#], Canham JP, Consitt LA, Zheng D, Koves TR, Gavin TP, Holbert D, Neufer PD, Muoio DM, and Houmard JA. A high fat diet elicits differential responses in genes coordinating lipid oxidative metabolism in the skeletal muscle of lean and obese humans. *J Clin Endocrinol Metab*, 96(3):775-81, 2011. PMID: 21190973. [#]corresponding author.

7. **Boyle KE**[#], Zheng D, Anderson EJ, Neufer PD, and Houmard JA. Mitochondrial lipid oxidation is impaired in cultured myotubes from obese humans. *Int J Obes* (Lond.) 36:1025-31, 2012. PMID: 22024640. [#]corresponding author.

8. **Boyle KE**[#], Newsom SA, Janssen RC, Lappas M, and Friedman JE. Skeletal muscle MnSOD, mitochondrial complex II, and SIRT3 enzyme activities are decreased in maternal obesity during human pregnancy and gestational diabetes mellitus. *J Clin Endocrinol Metab*. 98(10):E1601, 2013. PMID: 23956348. [#]corresponding author.

9. Newsom SA, **Boyle KE**, and Friedman JE. Sirtuin 3: A major control point for obesity-related metabolic diseases? *Drug Discov Today Dis Mech* 10:e35-e40, 2013. *Review*. PMID: 23997790.

10. **Boyle KE[#]**, Hwang H, DeVente JM, Barbour L, Hernandez T, Mandarino LJ, Lappas M and Friedman JE. Gestational diabetes is characterized by reduced mitochondrial protein expression and altered calcium signaling proteins in skeletal muscle. *PLoS One*. 9(9):e106872, 2014. PMID: 25216282. [#]corresponding author. ***Top 25% most cited PLOS ONE articles*.

11. Schlaepfer IR, Glode LM, Hitz CA, Pac CT, **Boyle KE**, Maroni P, Deep G, Agarwal R, Lucia SM, Cramer SD, Serkova NJ, and Eckel RH. Inhibition of lipid oxidation increases glucose metabolism and enhances 2-deoxy-2-[18F]-fluoro-D-glucose uptake in prostate cancer mouse xenografts. *Mol Imaging Biol*. 17(4):529-38, 2015. PMID: 25561013.

12. Baker P*, **Boyle KE*[#]**, Muoio DM, Houmard JA, Friedman JE. Metabolomic analysis reveals altered skeletal muscle amino acid and fatty acid handling in obese humans. *Obesity* 23(5):981-8, 2015. PMID: 25864501. *equal author contribution, [#]corresponding author.

13. **Boyle KE[#]**, Patinkin ZW, Shapiro ALB, Baker PR II, Dabelea D, Friedman JE. Mesenchymal Stem Cells from Infants Born to Obese Mothers Exhibit Greater Potential for Adipogenesis: The Healthy Start BabyBUMP Project. *Diabetes*. 65(3):647-59, 2016. PMID: 26631736. [#]corresponding author. ***Featured in Nature Reviews Endocrinology. **F1000 Recommended Exceptional New Finding*.

14. Shapiro ALB, **Boyle KE**, Dabelea D, Patinkin ZW, De la Houssaye B, Ringham BM, Glueck D, Barbour LA, Norris J, Friedman JE. Nicotinamide promotes adipogenesis in umbilical cord-derived mesenchymal stem cells and corresponds to neonatal adiposity: The Healthy Start BabyBUMP Project. *PLoS One*. 11(7):e0159575, 2016. PMID: 27414406.

15. **Boyle KE**, Friedman JE, Underkofler C, Houmard JA, and Rasouli N. Fenofibrate increases skeletal muscle fatty acid oxidation in obese, insulin resistant humans. *Horm Metab Res*. Jan;49(1):50-57, 2017. PMID: 28103623.

16. Cavalli G, Justice JN, **Boyle KE**, D'Alessandro A, Eisenmesser EZ, Herrera JJ, Hansen KC, Nemkov T, Stienstra R, Garlanda C, Mantovani A, Seals DR, Dagna L, Joosten LA, Ballak DB, Dinarello CA. Interleukin 37 reverses the metabolic cost of inflammation, increases oxidative respiration, and improves exercise tolerance. *Proc Natl Acad Sci USA.* 114(9):2313-2318, 2017. PMID: 28193888.

17. **Boyle KE[#],** Patinkin ZW, Shapiro ALB, Bader C, Vanderlinden, L Kechris K, Janssen RC, Ford RJ, Smith BK, Steinberg GR, Davidson EJ, Yang IV, Dabelea D, Friedman JE. Maternal obesity alters fatty acid oxidation, AMPK activity, and associated DNA methylation in mesenchymal stem cells from human infants. *Mol Metab,* 6(11):1503-1516, 2017. PMID: 29107296 [#]corresponding author.

18. Baker PR II, Patinkin ZW, Shapiro ALB, De La Houssaye, B, Woontner M, **Boyle KE**, Vanderlinden L, Dabelea D, and Friedman JE. Maternal Obesity and Increased Neonatal Adiposity Correspond with Altered Infant Mesenchymal Stem Cell. *JCI Insight*, 2(21), 2017. PMID: 29093265.

19. Reusch JEB, Kumar TR, Regensteiner JG, Zeitler PS, and Conference Participants (31 other authors, including Boyle KE). Identifying the Critical Gaps in Research on Sex Differences in Metabolism Across the Life Span. *Endocrinology*, 159(1):9-19, 2018. *Review*. PMID:29300998.

20. Bruce KD, Gorkhali S, Given K, Coates AM, **Boyle KE**, Macklin WB, Eckel RH. Lipoprotein Lipase is a feature of alternatively-activated microglia and may facilitate lipid uptake in the CNS during demyelination. *Front Mol Neurosci*. 2018 Mar15;11-57, 2018. PMID: 29599706.

21. **Boyle KE**, Magill-Collins MJ, Newsom SA, Janssen RC, Friedman, JE. Maternal Fat-1 Transgene Protects Offspring from Excess Weight Gain, Oxidative Stress, and Reduced Fatty Acid Oxidation in Response to High-Fat Diet. *Nutrients*, 2020 Mar 14;12(3):767. PMID: 32183350.

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Book Chapters

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3. Redman LR, Laughlin GA, **Boyle KE**, and Loucks AB. 24-h mean ghrelin concentrations are normal in amenorrheic athletes. The Endocrine Society's 86th Annual Meeting, New Orleans, June 2004. Abstract #: P2-254, pg. 367.

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5. **Boyle KE**, Canham JP, Consitt LA, Zheng D, Gavin TP, and Houmard JA. Evidence for metabolic inflexibility in response to dietary lipid with obesity. APS Intersociety Meeting: The Integrative Biology of Exercise V, Hilton Head, September 2008. Abstract #: 22.15. Poster Presentation.

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7. **Boyle KE**, Zheng D, Anderson EJ, Neufer PD, and Houmard JA. Mitochondrial function is impaired in cultured myotubes from obese humans. International Biochemistry of Exercise Conference, University of Guelph, Ontario, Canada, June 2009. Abstract #: 14. Oral Presentation.

8. Anderson EJ, **Boyle KE**, Houmard JA, and Neufer PD. Obesity is associated with reduced glutathione content, increased mitochondrial H_2O_2 emitting potential and a more oxidized redox environment in human skeletal muscle. 2008 American Diabetes Association's 68th Scientific Sessions, San Francisco, CA.

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10. Kwak H-B, Lin C-T, Kane DA, Lee N-S, **Boyle, KE**, Houmard JA, Cortright RN, Neufer PD. Simvastatin Increases Mitochondrial Oxidative Stress and Reduces Mitochondrial Ca2+ Retention Capacity in Human Skeletal Myotubes, 2010 American College of Sports Medicine 57th Annual Meeting, Baltimore, MD.

11. **Boyle KE**, Hwang H, DeVente JM, Barbour L, Hernandez T, Bowen B, Zhengping Y, Mandarino LJ, and Friedman JE. Quantitative Proteomic Profile in Skeletal Muscle from Women with Gestational Diabetes Reveals Potential for Reduced Mitochondrial Function, 2010 American Diabetes Association 70th Scientific Sessions, Orlando, FL. Oral Presentation.

12. **Boyle KE**, Heerwagen MJ, and Friedman JE. Transgenic mice enriched for omega-3 fatty acids show improved skeletal muscle mitochondrial fuel switching in response to high-fat diet. August 2011, FASEB Summer Research Conference: Nutrient Control of Metabolism and Cell Signaling, Steamboat Springs, CO. Oral Presentation.

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14. **Boyle KE**, Houmard JA, Friedman JE, and Rasouli N. Fenofibrate increases lipid oxidation in human skeletal muscle, Poster Presentation at 2012 American Diabetes Association 72nd Scientific Sessions, Philadelphia, PA. Poster Presentation.

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16. Baker PR II, **Boyle KE**, Buti AL, Dabelea D, Barbour LA, Friedman JE. Stem Cells from Offspring of Mothers Demonstrate Evidence for Developmental Programming in Obesity. 2014 American Society of Human Genetics, San Diego, CA.

17. Baker PR II, **Boyle KE**, Shapiro ALB, Patinkin ZW, Dabelea D, and Friedman JE. Maternal Obesity Influences Amino Acid Metabolism in Offspring Umbilical Derived Stem Cells. 2015 Keystone Symposia: Diabetes and Metabolic Dysfunction, Santa Fe, NM.

18. Baker PR II, **Boyle KE**, Shapiro ALB, Patinkin ZW, Dabelea D, and Friedman JE. Maternal Obesity and Newborn Adiposity Correlate with Amino acid and Acylcarnitine Metabolism in Mesenchymal Stem Cells. 2015 Society for Inherited Metabolic Disease, Salt Lake City, UT.

19. **Boyle KE**, Patinkin Z, Shapiro ALB, Dabelea D, Friedman JE. Human mesenchymal stem cells from offspring of obese mothers have increased adipogenesis and evidence for insulin resistance: The Healthy Start Study. *2015 American Diabetes Association 75th Scientific Sessions, Boston, MA.* Oral Presentation at President's Oral Session.

20. Shapiro ALB, **Boyle KE**, Dabelea D, Patinkin Z, Glueck D, Barbour LA, Norris J, Friedman JE. Nicotinamide promotes adipogenesis in umbilical cord-derived mesenchymal stem cells and corresponds to neonatal adiposity: The Healthy Start study. *2015 American Diabetes Association 75th Scientific Sessions, Boston, MA*.

21. **Boyle KE**, Patinkin ZW, Shapiro ALB, Baker PR II, Dabelea D, Friedman JE. Disrupted GSK-3β/β-catenin signaling induces greater adipogenesis in mesenchymal stem cells derived from babies of obese women: The Healthy Start BabyBUMP Project. *2015 The Obesity Society ObesityWeek 2015, Los Angeles, CA.* Late Breaking Oral Presentation.

22. **Boyle KE**, Patinkin ZW, Shapiro ALB, Vanderlinden L, Kechris K, Dabelea D, & Friedman JE. DNA hypermethylation of metabolic genes corresponds to lower fatty acid oxidation in mesenchymal stem cells from infants of obese mothers: The Healthy Start BabyBUMP Project. *2016 Obesity and Adipose Tissue Biology, Keystone Symposia, Banff, Alberta, CA.* Oral presentation.

23. Baker PR II, Patinkin ZW, Shapiro ALB, De La Houssaye, B, Woontner M, **Boyle KE**, Dabelea D, and Friedman JE. Dysregulated Lipid Metabolism in Adipocyte Differentiated Umbilical Derived Mesenchymal Stem Cells Predicts Increased Infant Adiposity at 5 Months of Age. *2016 American Diabetes Association 76th Scientific Sessions, New Orleans, LA.*

24. **Boyle KE**, Patinkin ZW, Shapiro ALB, Yang I, Davidson B, Vanderlinden L, Kechris K, Dabelea D, & Friedman JE. DNA Hypermethylation Corresponds to Differences in Metabolism and Cellular Differentiation in Mesenchymal Stem Cells from Infants Born to Obese Mothers: The Healthy Start BabyBUMP Project. *2016 American Diabetes Association 76th Scientific Sessions, New Orleans, LA.* Oral Poster Presentation.

25. **Boyle KE**, Patinkin ZW, Shapiro ALB, Yang I, Davidson B, Vanderlinden L, Kechris K, Dabelea D, & Friedman JE. Reduced fatty acid oxidation in mesenchymal stem cells from infants of obese mothers corresponds to DNA hypermethylation of genes

regulating fatty acid metabolism: The Healthy Start BabyBUMP Project. *2016 Perinatal Biology Symposium, Aspen, CO. Poster Presentation.*

26. Cavalli, G, Ballak D, Justice JJ, **Boyle KE**, D'Alessandro A, Joosten LA, Dagna L, C. A. Dinarello CA. Interleukin 37 reverses the metabolic cost of inflammation, increases oxidative respiration, and improves exercise tolerance. *2017 European League Against Rheumatism (EULAR) Congress, Madrid, Spain.*

27. Patinkin ZW, Bader C, Dabelea D, **Boyle KE**. Oxidative Stress Linked to Lower Mitochondrial Fat Oxidation in Human Mesenchymal Stem Cells from High Adiposity Infants Born to Mothers with Obesity: The Healthy Start BabyBUMP Project. *2017 American Diabetes Association 77th Scientific Sessions, San Diego, CA. Late Breaking Poster Presentation.*

28. Keleher M, Friedman JE, Dabelea D, and **Boyle KE**. Maternal glucose and insulin are associated with AMPK and GSK3β proteins in human umbilical cord derived mesenchymal stem cells: The Healthy Start ECHO Cohort *2019 American Diabetes Association 79th Scientific Sessions, San Francisco, CA*

29. Keleher M, Shubhangi S, Brown A, Duensing A, Dabelea D, and **Boyle KE**. Maternal Obesity Linked to Hypertrophy in Adipogenic Infant MSCs: The Healthy Start ECHO Cohort, *ObesityWeek 2019, Las Vegas, NV. Oral Presentation*.

30. Chaves AB, Johnson JA, Zheng D, Dabelea D, Houmard JA, and **Boyle KE**. Infant Mesenchymal Stem Cell Insulin Sensitivity Is Associated with Maternal Plasma-Free Fatty Acids, Independent of Obesity Status: The Healthy Start Study. American Diabetes Association 80th Scientific Sessions, 2020. Poster#: 1328.

31. Duensing AM, Dabelea D, **Boyle KE**. Infant MSC Metabolism Correlates With Maternal Glucose and Offspring Adiposity: Healthy Start Study. The Obesity Society, ObesityWeek 2020.

32. Flanagan EW, Most J, Altazan AD, **Boyle KE**, Redman LR. A role for the pregravid maternal milieu in the intergenerational transmission of obesity. American Society for Nutrition, Live Online 2021.

33. Starling AP, Glueck DH, Allshouse WB, **Boyle KE**, Bloemsma LD, Hamman RF, Adgate JL, Dabelea D. Prenatal exposure to per- and polyfluoroalkyl substances and child adiposity at age 5 years: a multipollutant analysis. International Society for Environmental Epidemiology Meeting 2021.

34. Erickson ML, Dobias D, Dabelea D, Broussard JL, **Boyle KE.** Circadian Clock Gene Amplitude is Linked to Fat Stores in Mesenchymal Stem Cells from Human Infants. Society for Research on Biological Rhythms, Biennial Conference 2022.

35. Huff KK, Roell K, Bulka CM, **Boyle KE**, Breton CV, Burt AA, Dabelea D, Kahn LG, Karagas MR, Ladd-Acosta C, Marsit CJ, Niemiec S, Volk HE, O'Shea TM, Fry RC on behalf of program collaborators for Environmental influences on Child Health Outcomes (ECHO). Evaluation of associations between pre-pregnancy maternal body mass index, gestational diabetes, and epigenetic gestational aging in the placenta. Society for Pediatric and Perinatal Epidemiologic Research (SPER) June 2022, Chicago

36. Huff KK, Roell K, Bulka CM, **Boyle KE**, Breton CV, Burt AA, Dabelea D, Kahn LG, Karagas MR, Ladd-Acosta C, Marsit CJ, Niemiec S, Volk HE, O'Shea TM, Fry RC. Maternal pre-pregnancy obesity and gestational diabetes: associations with epigenetic

gestational aging in the placenta, American Diabetes Association 82nd Scientific Sessions, 2022.

37. Gyllenhammer LE, Keleher MR, Wood C, Yang IV, Friedman JE, Janssen J, Dabelea D, Kechris K, **Boyle KE**. The Umbilical Cord Mesenchymal Stem Cell Transcriptome is Associated With Childhood Adiposity Gain. Selected for Lightening Talk at: The Obesity Society ObesityWeek 2022, San Diego, CA.

38. Waldrop SW, Wood C, Niemiec S, Yang IV, Kechris K, Borengasser SJ, Dabelea D, and **Boyle KE**. Triglyceride and Insulin in Late Gestation Associate with Cord Blood DNA Methylation of Genes Regulating Adipogenesis, Nutrient Metabolism, and Immune Function and with Later Offspring Adiposity at 5 Months of Age. Presented at: The Obesity Society ObesityWeek 2022, San Diego, CA.

39. Gyllenhammer LE, Zaegel V, Duensing, AM, Lixandrao ME, Dabelea D, Berbman BC, **Boyle KE**. Lipidomics in Infant Mesenchymal Stem Cells: Fetal Determinants and Predictors of Child Adiposity. Presented at: ObesityWeek 2023. Dallas TX.

40. Lixandrao ME, Duensing AM, Dabelea D, **Boyle KE**. Lipidomics in human umbilical cord-derived MSC are associated with gestational fatty-free acids and triacylglycerols and child adiposity: The Healthy Start Study. **Oral Presentation at ASN Nutrition 2023. **Selected as finalist for top Postdoc Abstract.**

Abstracts (Non-Competitive)

1. **Boyle KE**, Heerwagen MJ, and Friedman, JE. Maternal Inflammation Programs Offspring Skeletal Muscle Metabolism, Regardless of Postnatal Diet. Annual BIRCWH Scholars Meeting, Washington D.C., October 2013. *Poster Presentation*.

2. **Boyle KE**, Hwang H, DeVente JM, Barbour L, Hernandez T, Mandarino LJ, Lappas M and Friedman JE. Proteomic analysis reveals reduced mitochondrial protein expression and altered calcium signaling proteins in human skeletal muscle during gestational diabetes Center for Women's Health Research Women's Health Research Day 2013. *Poster Presentation, Poster Award.*

3. **Boyle KE**, Patinkin ZW, Shapiro ALB, Vanderlinden L, Kechris K, Dabelea D, & Friedman JE. Maternal obesity programs reduced fatty acid oxidation and DNA hypermethylation of metabolic genes in infant umbilical cord derived mesenchymal stem cells: The Healthy Starty BabyBUMP Project. 2016 University of Colorado School of Medicine Department of Pediatrics Research Day. *Poster Presentation*.

4. Buti AL, **Boyle KE**, Dabelea D, Gleuck D, Barbour LA, Norris J, and Friedman JE. Nicotinamide and its effect on adipogenesis in human umbilical cord-derived mesenchymal stem cells: The Healthy Start Study. Translational Science Conference, Washington D.C., 2014.

5. **Boyle KE**, Patinkin ZW, Shapiro ALB, Vanderlinden L, Kechris K, Dabelea D, & Friedman JE. Maternal obesity programs reduced fatty acid oxidation and DNA hypermethylation of metabolic genes in infant umbilical cord derived mesenchymal stem cells: The Healthy Start BabyBUMP Project. *2016 University of Colorado School of Medicine Department of Pediatrics Research Day, Aurora, CO. Poster Presentation.*

6. Quist RE, Patinkin ZW, and **Boyle KE**. Mesenchymal Stem Cells of Infants Born to Mothers with Obesity may Provide Clues to Future Obesity Risk: The Healthy Start

BabyBUMP Project. 2016 University of Colorado 19th Annual Research and Creative Activities Symposium.

7. **Boyle KE**, Patinkin ZW, Shapiro ALB, Yang I, Davidson B, Vanderlinden L, Kechris K, Dabelea D, & Friedman JE. Reduced fatty acid oxidation in mesenchymal stem cells from infants of obese mothers corresponds to DNA hypermethylation of genes regulating fatty acid metabolism: The Healthy Start BabyBUMP Project. *2016 Center for Women's Health Research Day, Aurora, CO. Poster Presentation, Poster Award.*

8. Salzmann-Sullivan M, Su L-J, Jihye Kim, **Boyle K**, Lam E, Flaig T, and Schlaepfer IR. CPT1A and AR blockade result in differential regulation of genetic and metabolic pathways in castration resistant prostate cancer cells. *2018 University of Colorado Department of Medicine Research Day.*

9. Shubhangi S, Keleher M, Duensing A, Dabelea D, and **Boyle KE**. Adipogenic Differentiating Mesenchymal Stem Cells from Infants of Obese Mothers Have Greater Lipid Content and Cell Size in 3-Dimensional Culture, *Aspen Snowmass Perinatal Biology Symposium 2019, Snowmass CO. Poster Presentation*.

10. Lixandrao ME, Duensing AM, Dabelea D, **Boyle KE**. Lipid metabolism of infant mesenchymal stem cells predicts child adiposity in a sex-specific manner: The Healthy Start Study. Presented at: Center for Women's Health Research Day, 2023.