Melissa Ann Luse

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SUMMARY

- Highly motivated and goal oriented molecular physiologist with seven years of research experience
- Specific research interests and skills focused on the intersection of metabolism and cardiovascular biology
- Principle investigator on two independent grants funding entire doctoral project
- Excellent communication and oral presentation skills

EDUCATION

PhD in Biomedical Science (Molecular Physiology and Biological Physics) **July 2019 – May 2024E**
University of Virginia School of Medicine Charlottesville, VA

- Awarded the 2023 Outstanding Graduate Student designation by the *American Physiology Society*
- Applied and awarded the $62K *American Heart Association* fellowship grant to study the role adipose blood vessels play in cardiovascular disease
- Awarded the $50K *National Institute of Health* Cardiovascular Training grant
- GPA: 4.0

B.S. in Neurobiology and Physiology **August 2015 – May 2019**
University of Maryland College Park, MD

- Honors biology program, GPA: 3.4
- Undergraduate Research Assistant 2017-2019, focused on understanding how opsin proteins in the eye regulate vision

LABORATORY SKILLS

Molecular Biology
- PCR, qPCR, Western blots, ELISA
- Immunoprecipitation, Biotin pull down
- Cellular membrane fractionation
- Plasmid and siRNA transfections

Tissue Culture
- Primary human endothelial cell culture: adipose
  coronary and aortic artery, umbilical vein
- Primary human vascular smooth muscle cells and adipose stem cells
- Cell lines: HEK293T, HeLa
- Transwell co-culture

Ex Vivo
- Pressure myography on intact blood vessels
- *En face* preparation of blood vessels

In Vivo
- Gross and microdissections, cardiac puncture, perfusion
- Insulin and glucose tolerance tests, survival surgery, EchoMRI

Rodent work
- Mouse genetics (Cre-Lox), injections, colony management

Microscopy
- Confocal microscopy
- Immunohistochemistry: cells, tissue sections, whole tissue staining and clearing

Computational
- scRNAseq and bulk RNAseq experimental design, execution, and downstream analysis
- Rstudio

ACADEMIC AND PROFESSIONAL EXPERIENCE

Predoctoral Researcher **July 2019 – Present**
University of Virginia Charlottesville, VA

- Create data driven award winning presentations for various global conferences to communicate research results to audiences both inside and outside the scientific field
- Manage multiple concurrent experimental workstreams to answer fundamental questions in regards to vascular metabolism and cardiovascular disease
- Developed new methods to analyze adipose vasculature using scRNAseq, tissue culture, and microscopy
- Author of one "first author" paper (three additional in-progress), one "first author" review (one additional in review) focused on communicating scientific findings and expertise to the field
- Mentor for three undergraduate students, five graduate rotation students, and two visiting physicians with the goal of producing independent scientific researchers

Research and Consulting Intern **January 2019 – May 2019**
Gryphon Scientific Takoma Park, MD

- Researched and compiled in-depth client reports to identify scientific strategies to solve various business,

production, or marketing issues for a public health consulting firm
- Coordinated with colleagues to produce a market research study on fabric resins and the impact on public health for a client interested in marketing a silk-based alternative

Research Intern Nonclinical R&D **June 2018 – August 2018**
Boehringer Ingelheim Ridgefield, CT
- Participated on a team researching new methods to stabilize monoclonal antibodies for a pharmaceutical company
- Designed and produced a detailed database categorizing various stabilizing formulations to enhance the departments data availability
- Analyzed data to determine if existing stabilizer formulations could be utilized for new products

LEADERSHIP EXPERIENCE

Director **January 2021 – Present**
Cardiovascular Research Center Career Development Charlottesville, VA
- Lead a team at the University of Virginia to create and organize a yearly seminar series focused on career development

Academic Relations Chair **May 2021 – Present**
Graduate Biosciences Society Charlottesville, VA
- Organize and host scientific academic symposiums featuring UVA faculty and high-profile guest speakers

PRESENTATIONS

- **Endothelial Cell Interest Group**, University of Virginia, Charlottesville, VA **May 2023**
  "Caveolin-1 the metabolic enigma"
- **Oral Presentation**, American Physiology Summit, Long Beach, CA **April 2023**
  "Cav1 facilitates lipid uptake into endothelium by stabilizing Cd36 at the plasma membrane"
- **Oral Presentation**, Fat Disorders Resource Society, Atlanta, GA **April 2023**
  "Adipose Heterocellular contact can regulate lipid handling"
- **Oral and Poster Presentation**, Endothelial Cell Phenotype (GRC), Barcelona, Spain **June 2022**
  "Adipose Heterocellular contact can regulate lipid handling"
- **Oral and Poster Presentation**, Experimental biology, Philadelphia, PA **April 2022**
  "Genetic deletion of endothelial Caveolin-1 is protective against metabolic disease"
- **PhD Candidacy Exam**, University of Virginia, Charlottesville, VA **June 2021**
  "Capillary Endothelial cell-adipocyte gap junctions mediate adipose function"
- **Oral Presentation,** Physiology Department, University of Virginia, Charlottesville, VA **October 2020**
  "Adipose Endothelium"

PUBLICATIONS

1. **Luse MA**, LS Dunaway, S Nyshadlam, A Carvalho, MW Sedovy, CA Ruddiman, R Tessema, K Hirschi, SR Johnstone, BE Isakson. Endothelial-adipocyte Cx43-mediated gap junctions can regulate adiposity. *In Preparation*
2. **Luse MA,** W Schug, LS Dunaway, S Loeb, A Carvalho, R Tessema, S Nyshadham, C Pavelic, TCS Keller IV, A Kosmach, AK Best, TM Sveeggen, K Levental, R Mitchell, I Levental, RD Minshall, N Leitinger, L Columbus, P Bagher, M Cortese-Krott, BE Isakson. Dynamic nitrosation-palmitoylation of CD36 regulates plasma lipids. *Circulation, In Review*; *medRxiv Processing*
3. Wolpe AG, **MA Luse**, C Baryjames, JB Wolpe, SR Johnstone, HR Askew-Page, Y-l Chen, V Sabapathy, B Wakefield, E Cifuentes-Pagano, MV Artamonov, AV Somlyo, AC Straub, R Sharma, F Beier, EJ Barrett, PJ Pagano, SK Sonkusare, S Redemann, L Columbus, S Penuela, BE Isakson. Pannexin-3 stabilizes the transcription factor Bcl6 in a channel-independent manner to protect against vascular oxidative stress. *Science Signaling*. Jan 30; 17(821):eadg2622. doi: 10.1126/scisignal.adg2622, 2024.
4. Dunaway L*, **MA Luse*,** S Nyshadham, G Bulut, G Alencar, N Chavkin, M Cortese-Krott, K Hirschi, BE Isakson. Obesogenic diet disrupts tissue specific mitochondrial gene signatures in the artery and capillary endothelium. *Physiological Genomics*, Feb 1;56(2):113-127, 2024.

5. **Luse MA**, MG Jackson, ZJ Juśkiewic, BE Isakson. Physiological function of caveolae in endothelium. *Current Opin Physiol.* Oct:35:100701. doi: 10.1016/j.cophys.2023.100701, 2023.
6. Ruddiman CA, R Peckham, **MA Luse**, Y-L Chen, M Kuppusamy, B Corliss, PJ Hall, C-J Lin, SM Peirce, SK Sonkusare, RP Mecham, JE Wagenseil, BE Isakson. Polarized localization of phosphatidylserine in endothelium regulates Kir2.1. *JCI Insight*, May 8 8(9); doi: 10.1172/jci.insight.165715, 2023
7. Ragland TJ, EM Heiston, A Ballantyne, NR Stewart, S LaSalvia, **MA L**use, BE Isakson, U Erdbrügger, SK Malin. Extracellular vesicles and insulin-mediated vascular function in metabolic syndrome. *Physiol Rep* 11 (1):e15530, 2023
8. **Luse MA*,** N Krüger*, ME Good, LA Biwer, V Serbulea, RA Deaton, N Leitinger, A Gödecke, BE Isakson. Smooth muscle cell fat mass obesity (FTO) can regulate contractile function, *Am J Physiol,* 323(6):H1212-H1220, 2022.
9. Garande ME, S Hargett, DS Lank, MC Lemke, **MA Luse**, BE Isakson, IM Bochkis, JM Linden, TE Harris. Feeding desensitizes A1 adenosine receptors in adipose through FOXO1-mediated transcriptional regulation. *Molecular Metabolism*, Sep;63:101543. doi: 10.1016/j.molmet.2022.101543, 2022.
10. **Luse MA**, EM Heiston, SK Malin, BE Isakson. Cellular and functional effects of insulin based therapies and exercise on endothelium. *Curr Pharm Des*, 26: 3760-3767, 2020.
11. Hussain, Syed and Tran, Tuyet-Minh and Ware, Timothy B. and **Luse, Melissa A.** and Prevost, Christopher T. and Ferguson, Ashley N. and Kashatus, Jennifer A. and Hsu, Ku-Lung and Kashatus, David, RalA and PLD1 Promote Lipid Droplet Growth in Response to Nutrient Withdrawal. *Cell reports* 36.4 (2021): 109451

* = co-first author

PERSONAL

Interests: Marathon and social running, Science Communication, Animal welfare