

CARRIE B. WIESE

Assistant Researcher, Human Genetics & Metabolism Research Theme

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During my postdoctoral training, I have evaluated the role of X chromosome genes in conferring sex differences in metabolic disease. This work has focused on epigenetic transcriptional regulation mediated by histone demethylase enzymes encoded on the sex chromosomes. More recently, I have identified a role for sex chromosomes impacting DNA methylation through unknown mechanisms. My independent research program will focus on 1) elucidating the role of Kdm6a, an X chromosome gene, in brown adipose tissue and 2) explore additional roles of sex chromosomes in mediating metabolic sex differences with a focus on mechanisms of transcriptional regulation.

EDUCATION

- 2012–2019 *Doctor of Philosophy*, Molecular Physiology & Biophysics, Vanderbilt University
Dissertation: Extracellular and intracellular microRNA gene regulatory networks in cardiovascular disease.
- 2004–2008 *Bachelor of Science*, Molecular Biology *cum laude*, Univ. of Tenn. at Chattanooga
Departmental Honors Research Thesis: Evaluation of gene expression patterns associated with genomic instability in colon cancer.

PROFESSIONAL & RESEARCH POSITIONS

- 2024–Pres. *Assistant Researcher*, Human Genetics, UCLA
- 2019–2024 *Postdoctoral Scholar*, Human Genetics, UCLA
Advisor: Karen Reue, PhD. Evaluated the contribution of sex components—sex chromosomes and gonadal hormones—to metabolic disease differences between females and males, including obesity, fatty liver, and atherosclerosis.
- 2013–2019 *PhD Candidate*, Molecular Physiology & Biophysics, Vanderbilt University
Advisor: Kasey C. Vickers, PhD. Developed a therapeutic strategy using high density lipoproteins (HDL) to deliver microRNA inhibitors to the endothelium, which significantly reduced atherosclerotic disease. Evaluated extracellular microRNAs in a novel cell-to-cell communication network facilitated by HDL.
- 2009–2012 *Research Assistant II*, Division of Genetic Medicine, Vanderbilt University
Advisor: Michelle Southard-Smith, PhD. Defined neural crest stem cell lineages and identified transcription factors regulating patterning in urogenital tract innervation.
- 2008–2009 *Laboratory Technician*, Notus Laboratories, Chattanooga, TN
- 2007–2008 *Undergraduate Researcher*, Univ. of Tenn. at Chattanooga

FUNDING

Active Funding

Career Development Award (24CDA1269864) American Heart Association Epigenetic regulation in atherosclerosis.	(PI: Wiese)	09/2024-08/2027
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Completed Funding

AtheroGEN Junior Investigator Award Leducq Foundation Tissue and cell-free DNA methylation as a tool to differentiate plaque phenotypes and unravel sex-specific disease mechanisms in mice and humans.	(coPI:Wiese)	01/2024-12/2024
Ruth L. Kirschstein NRSA Award (F32 DK134148) National Institute of Diabetes and Digestive and Kidney Diseases (NIH/NIDDK) Epigenetic mechanisms underlying sex differences in obesity.	(PI: Wiese)	03/2023-08/2024
Postdoctoral Fellowship (20POST35100000) American Heart Association A novel genetic mechanism underlying sex differences in adipose tissue expansion.	(PI: Wiese)	04/2020-03/2022
Graduate Research Fellowship (1445197) National Science Foundation Distribution and impact of inflammatory cell-originating HDL-microRNAs <i>in vivo</i> .	(PI: Wiese)	07/2015-06/2018
T32 Training Fellowship (T32 HL069765) National Institute of Health: NHLBI Immunobiology of blood & vascular systems training program.	(PI: Hawiger, Trainee: Wiese)	07/2013-06/2015

AWARDS

2024	Chancellor's Award for Postdoctoral Research Nominee UCLA
2024	Investigator in Training Award American Heart Association (ATVB) <i>The Investigator in Training Award recognizes talented early career investigators in training in arteriosclerosis, thrombosis and vascular biology, and have potential to become future leaders.</i>
2023	Travel Award Keystone Symposia—Adipose Tissue: Energizing Good Fat
2022	Florence Haseltine Poster Award Organization for the Study of Sex Differences
2022	Poster Award (First place) Joint UCLA SCORE Symposium
2021	Poster Award (First place) Joint UCLA SCORE Symposium
2019	Postdoctoral Excellence in Research Award UCLA Human Genetics
2017	Junior Investigator Award for Women American Heart Association (ATVB) <i>The Junior Investigator Award for Women helps recruit and retain women in the field of arteriosclerosis, thrombosis, and vascular biology by recognizing excellent research conducted by women.</i>
2017	Graduate Student Poster Award Vanderbilt MPB Department Retreat
2016	Graduate Student Poster Award Gill Heart Institute Cardiovascular Research Day
2014	Travel Award for Young Investigators American Heart Association (ATVB)
2014	Graduate Student Poster Award Southeast Lipid Research Conference (SELRC)
2013	Graduate Student Poster Award Vanderbilt Cardiovascular Research Day
2007	Provost Student Research Award University of Tennessee at Chattanooga

PROFESSIONAL ACTIVITIES

2024—Pres.	Member, K Scholar Society, UCLA
2022	Member, Organization for the Study of Sex Differences (OSSD)
2021	Reviewer-in-Training, American Heart Association Fellowship Study Section
2020—Pres.	Review Editor, Editorial Board of Sex and Gender in Cardiovascular Medicine of Frontiers in Cardiovascular Medicine
2020—Pres.	Ad Hoc Reviewer, Journals: eLife, Frontiers in Physiology, Frontiers in Cardiovascular Medicine.

2020–2021 Co-organizer, Sex Differences SCORE Symposium, UCLA
2014–Pres. Member, American Heart Association (ATVB Council)

Training

2023 Lab Management and Leadership Training, Torrey Pines Training Consortium
2022 Center for the Improvement of Mentored Experience in Research (CIMER) Training in Effective Research Mentorship for Postdocs and Future Faculty, UCLA
2020 Ethics and Integrity in Biomedical Research (RCR), UCLA
2019 Collaboratory Computational Training (5 courses), UCLA
Unix, R, Next Generation Sequencing, RNAseq I, RNAseq II
2015 Statistical Analysis of Gene Expression Data, Vanderbilt Center for Quantitative Sci.
2014–2015 Certificate in College Teaching, Vanderbilt University
2013, 15, 17 Responsible Conduct of Research Training, Vanderbilt University

PUBLICATIONS

Research and Review Articles (* co-first authorship)

1. **Wiese CB**, Agle Z, Vergnes L, and Reue K. X chromosome gene, *Kdm6a*, confers sex differences in mature adipocyte function impacting cardiometabolic health. (In preparation).
2. Avetisyan R, **Wiese CB**, Vergnes L, Agle Z, Benitez K, Dombroski C, and Reue K. KDM5C, a histone demethylase with sex-biased gene dosage, modulates adipose tissue thermogenesis. (In preparation).
3. Zhang Z, Su V, **Wiese CB**, Cheng L, Cui Y, Kim J, Wu X, Tran P, Zhou Z, Casero D, Li W, Hevener AL, Reue K, and Sallam T. A genome-wide ATLAS of liver chromatin architecture reveals that sex dictates diet-induced nucleosome dynamics. *BioRxiv* (Preprint). 2025. Mar 10:2024.11.13.623052.
4. **Wiese CB**, Soliman B, and Reue K. The Four Core Genotypes mouse model: evaluating the impact of a recently discovered translocation. *Biology of Sex Differences*. 2024. Oct 31;15(1):90. [PMC11529163]
5. Zhang P, Munier JJ, **Wiese CB**, Vergnes L, Link J, Ronquillo E, Munoz A, Kuang Y, Liu M, Sanchez-Kaiser G, Oni-Orisan A, Iribarren C, Nomura DK, Krauss RM, Medina MW, and Reue K. X chromosome dosage drives statin-induced dysglycemia and mitochondrial dysfunction. *Nature Communications*. 2024. Jul 2;15(1):5571. [PMC11219728]
6. Vergnes L, **Wiese CB**, Zore T, Riestenberg C, Avetisyan R, and Reue K. Gene regulation and mitochondrial activity during white and brown adipogenesis are modulated by KDM5 histone demethylase. *Journal of the Endocrine Society*. 2024. Feb 13;8(4). [PMC10904225]
7. **Wiese CB**, Avetisyan R, and Reue K. The impact of chromosomal sex on cardiometabolic health and disease. *Trends in Endocrinology and Metabolism*. 2023. Oct; 34(10):652-665. [PMC11090013]
8. **Wiese CB**, Agle ZW, Zhang P, and Reue K. Chromosomal and gonadal sex drive sex differences in lipids and hepatic gene expression in response to hypercholesterolemia and statin treatment. *Biology of Sex Differences*. 2022. Nov 4;13(1):63. [PMC9636767]
9. Reue K and **Wiese CB**. Illuminating the mechanisms underlying sex differences in cardiovascular disease. *Circulation Research*. 2022. June 10;130(12):1747-1762. [PMC9202078]

10. Zhong J, Yang H, Yermalitsky V, Shelton EL, Otsuka T, **Wiese CB**, May-Zhang LS, Banan B, Abumrad N, Huang J, Canvar AB, Kirabo A, Yancey PG, Fogo AB, Vickers KC, Linton MF, Davies SS, and Kon V. Kidney injury disruption of intestinal lymphatics involves dicarbonyl-modified lipoproteins. *Kidney International*. 2021. S0085-2523(21)00577-9. [PMC8447488]
11. Link J*, **Wiese CB***, Chen X, Avetisyan R, Ronquillo E, Ma F, Guo X, Yao J, Allison M, Chen Y, Rotter J, Moustafa J, Small K, Iwase S, Pellegrini M, Vergnes L, Arnold A, and Reue K. X chromosome dosage of histone demethylase KDM5C determines sex differences in adiposity. *The Journal of Clinical Investigation*. 2020. 130(11):5688-5702. [PMC7598065]
12. Cuesta Torres LF, Zhu W, Öhrling G, Larsson R, Patel M, **Wiese CB**, Rye KA, Vickers KC, and Tabet F. High-density lipoproteins induce miR-223-3p biogenesis and export from myeloid cells – role of scavenger receptor BI-mediated lipid transfer. *Atherosclerosis*. 2019. 286:20-29. [PMC7477814]
13. **Wiese CB**, Zhong J, Xu Z, Zhang Y, Ramirez-Solano M, Zhu W, Linton MF, Sheng Q, Kon V, and Vickers KC. Dual inhibition of endothelial miRNA-92a-3p and miRNA-489-3p reduces renal injury-associated atherosclerosis. *Atherosclerosis*. 2019. 282:121-131. [PMC7484899]
14. **Wiese CB***, Deal K*, Ireland S, Cantrell VA, and Southard-Smith ME. Migration pathways of sacral neural crest during development of lower urogenital tract innervation. *Developmental Biology*. 2017. 429(1):356-369. [PMC5572097]
15. Beavers KR, Werfel TA, Shen T, Kavanaugh TE, Kilchrist KV, Mares JW, Fain JS, **Wiese CB**, Vickers KC, Weiss SM, and Duvall CL. Porous silicon and polymer nanocomposites for delivery of peptide nucleic acids as anti-microRNA therapies. *Advanced Materials*. 2016. 28(36):7984-7992. [PMC5152671]
16. Georgas KM, Armstrong J, Keast JR, Larkins CE, McHugh KM, Southard-Smith EM, Cohn MJ, Batourina E, Dan H, Schneider K, Buehler DP, **Wiese CB**, Brennan J, Davies JA, Harding SD, Baldock RA, Little MH, Vezina CM, and Mendelsohn C. An illustrated anatomical ontology of the developing mouse lower urogenital tract. *Development*. 2015. 142:1893-1908. [PMC4440924]
17. Babaev VR, Hebron KE, **Wiese CB**, Toth CL, Ding L, Zhang Y, May JM, Fazio S, Vickers KC, and Linton MF. Macrophage deficiency of Akt2 reduces atherosclerosis in *Ldlr* null mice. *Journal of Lipid Research*. 2014. 55(11):2296-2308. [PMC4617132]
18. Tabet F*, Vickers KC*, Cuesta Torres LF, **Wiese CB**, Shoucri BM, Lambert G, Catherinet C, Levin MG, Thacker S, Sethupathy P, Barter PJ, Remaley AT#, and Rye KA#. HDL-transferred microRNA-223 regulates ICAM-1 expression in endothelial cells. *Nature Communications*. 2014. 5:3292. [PMC4189962]
19. **Wiese CB***, Fleming NL*, Buehler DP, and Southard-Smith EM. A UchL1-Histone2B mCherry:GFP-gpi BAC transgene for imaging neuronal progenitors. *Genesis*. 2013. 51(12):852-861. [PMC3953494]
20. **Wiese CB**, Ireland S, Fleming NL, Valerius MT, Georgas K, Brennan J, Armstrong J, Little MH, McMahon AP, and Southard-Smith EM. A genome-wide screen to identify transcription factors in pelvic ganglia of the lower urinary tract. *Frontiers in Neuroscience*. 2012. 6:130. [PMC3439845]
21. Buehler DP, **Wiese CB**, Skelton SB, and Southard-Smith EM. An optimized procedure for fluorescence-activated cell sorting (FACS) isolation of autonomic neural progenitors for visceral organs of fetal mice. *Journal of Visualized Experiments*. 2012. 66: e4188. [PMC3671830]

PRESENTATIONS

Invited Presentations

- 2025 Sex determinants of atherosclerosis at single-cell resolution. Organization for the Study of Sex Differences (OSSD) Conference, Albuquerque, NM.
- 2025 X chromosome escape genes drive metabolic sex differences. NAVBO Symposium: Chromosomes contribute to vascular (dys)function. Online.
- 2024 The X chromosome gene *Kdm6a* confers sex differences in mature adipocyte function impacting cardiometabolic health. Vascular Discovery Conference, Chicago, IL.
- 2024 X chromosome gene dosage influences sex differences in obesity. UCLA Joint SCORE Symposium, Los Angeles, CA.
- 2022 Impact of X chromosome genes on preadipocyte and mature adipocyte function. NIH Specialized Centers of Research Excellence (SCORE) Annual Meeting, Virtual.
- 2020 *Kdm5c* gene dosage determines sex differences in adiposity. NIH Specialized Centers of Research Excellence (SCORE) Annual Meeting, Virtual.
- 2016 Myeloid-originating miR-223 regulates systemic glucose and cholesterol via HDL intercellular communication. Keystone Symposia – Small RNA Silencing: Little Guides, Big Biology, Keystone, CO.
- 2015 Functional impact of inflammatory cell-originating HDL-miR-223 communication *in vivo*. International Symposium on Atherosclerosis, Amsterdam, Netherlands.
- 2014 HDL-microRNA-92a and interleukin-33 axis underlies endothelial dysfunction associated with atherosclerosis and chronic kidney disease. ATVB, Toronto, Ontario, Canada.

Select Conference Poster Presentations (total 25 presentations)

- 2023 X chromosome genes confer sex differences in preadipocyte and mature adipocyte function. Keystone Symposia—Adipose Tissue: Energizing Good Fat, Keystone, CO.
- 2022 Impact of X chromosome genes on preadipocyte and mature adipocyte function. Organization for the Study of Sex Differences (OSSD) Conference, Marina del Rey, CA.
- 2021 *Kdm5c* gene dosage determines sex differences in adiposity. Joint UCLA SCORE Symposium: Sex Differences in Brain-Gut Disorders and Metabolism (Virtual).
- 2017 Chronic kidney disease-associated atherosclerosis is attenuated by dual inhibition of microRNA-92a and microRNA-489. American Heart Association ATVB, Minneapolis, MI.
- 2015 Best of AHA Specialty Conferences: Functional impact of inflammatory cell-originating HDL-miR-223 communication *in vivo*. American Heart Association Scientific Sessions, Orlando, FL.

University-specific Oral Presentations

- 2019 Human Genetics Department Academic Retreat, UCLA
- 2017 Cardiovascular Research Seminar Series, Vanderbilt University
- 2015,17 Three Minute Thesis Competition, Vanderbilt University
- 2015,16 Molecular Physiology & Biophysics Departmental Seminar Series, Vanderbilt University
- 2013,14 Immunobiology of Blood and Vascular Systems Forum, Vanderbilt University

MENTORING AND TEACHING EXPERIENCES

Mentoring

Mentee Name	Mentoring Time	Position, Institution/Program	Result of Mentorship	Current Position, Institution
Malvika Iyer	10/2024 – Pres.	Undergraduate researcher, UCLA	Research experience 2 academic research courses	Undergraduate student, UCLA
Vanessa Barrios	09/2023 – 12/2023	Undergraduate researcher, UCLA	Research experience 1 academic research course	Undergraduate student, UCLA
Barbara Soliman	06/2022 - 08/2022 09/2023 – 12/2023	Summer intern, LA-HIP 2.0 Program Undergraduate researcher, UCLA	Poster presentation 1 academic research course 1 co-authored publication	Undergraduate student, UCLA
Anna Spiering	03/2023 - 10/2023	Visiting Master's student, UCLA	Master's internship thesis	Doctoral student, Utrecht Univ., Netherlands
Maxwell Yao	06/2022 - 08/2022 01/2024 – 06/2024	Undergraduate researcher, UCLA	Research experience	Undergraduate student, UCLA
Julia Unas	06/2022 - 08/2022	Visiting summer undergraduate researcher, UCLA	Research experience	Undergraduate student, Columbia Univ.
Gillian Folk	11/2019 – 12/2022	Undergraduate researcher, UCLA	3 poster presentations 4 academic research courses	Medical student, UCSD
Zoey Agle	11/2020 – 05/2021 06/2021 – 04/2023	Undergraduate researcher, UCLA Post-bacc researcher, UCLA	1 co-authored publication 3 poster presentations Poster presentation award from OSSD 3 academic research courses Highest departmental honors graduate	Medical student, University of Southern California
Casey Orozco-Poore	06/2015 – 08/2015	Visiting undergraduate researcher, Vanderbilt University	Poster presentation	Medical resident, UCLA

Graduate and Undergraduate Student Courses

- 2024 *Invited Lecturer*, Sex Differences in Metabolism Undergraduate Journal Club, UCLA
- 2015-16 *Teaching Fellow*, Interdisciplinary Graduate Program Focus Course, Vanderbilt Univ.
- 2014 *Invited Lecturer*, Molecular Aspects of Obesity and Diabetes, Vanderbilt Univ.

Community Outreach

- 2025 *Judge*, San Bernardino, Inyo, and Mono Counties Science Fair, Los Angeles, CA.
- 2024 *Judge*, The Bruin Experiment Science Fair, Los Angeles, CA.
- 2023 *Judge*, San Bernardino, Inyo, and Mono Counties Science Fair, Los Angeles, CA.
- 2016-17 *Scientist on Site Volunteer*, Adventure Science Center, Nashville, TN
- 2016 *Volunteer Teacher*, Girls Inc, Nashville, TN
- 2015 *Volunteer Teacher*, Vanderbilt Student Volunteers for Science, Vanderbilt Univ.
- 2013-14 *Volunteer Teacher*, Aspirinaunt™ Program, Vanderbilt Univ.