

Jacob L. Barber, M.S.
Department of Exercise Science
Arnold School of Public Health
University of South Carolina
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Education

Doctor of Philosophy, Exercise Science, Expected May 2022
University of South Carolina, Columbia, SC
Emphasis: Applied Physiology
Current GPA: 3.94

Master of Science, Exercise Science, May 2018
University of South Carolina, Columbia, SC
Emphasis: Applied Physiology
Thesis: The Effects of Exercise Training on Circulating Cardiovascular-related MicroRNAs
GPA: 3.8

Bachelor of Science, Exercise Science, May 2016
University of South Carolina, Columbia, SC
Cum Laude

Professional Experience

Graduate Research Assistant, University of South Carolina, Department of Exercise Science, Columbia, SC May 2016 – present

Project Co-Coordinator, University of South Carolina, Department of Exercise Science, Columbia, SC August 2016 – May 2017
NIH COBRE funded pilot project titled “*Effects of Short-Term Curcumin and Multi-Polyphenol Supplementation on the Anti-Inflammatory Properties of HDL*” (Dr. Mark Sarzynski-PI). Assisted in participant recruitment, data collection, analysis, and dissemination.

Honors and Awards

University of South Carolina Breakthrough Graduate Scholar Award, 2021

- Award given to the top 15 doctoral students across all departments at the University of South Carolina

NIH T-32 Pre-doctoral Training Fellowship, Behavioral-Biomedical Interface Program (5T32GM081740), 2018-Present

- Inter-disciplinary training with respect to biomedical conceptual frameworks and methods applied to understanding, treating, and

preventing adverse health conditions/disorders and promoting optimal health outcomes.

University of South Carolina Department of Exercise Science Outstanding Master's Student, 2018

American College of Sports Medicine Michael L. Pollock Student Scholarship Award Winner, \$200, 2017

Master's student poster award finalist, Southeast Chapter of the American College of Sports Medicine, 2017

Research Support/Grant Funding

Currently Funded

AHA Predoctoral Fellowship ID: 833917 April 1 2021 – April 2023

Title: Molecular Foundations of Lipoprotein Response to Exercise

Total Costs: \$63,040

Role: **PI**

UofSC SPARC Graduate Research Grant February 2021 – May 2022

Title: Molecular Foundations of Lipoprotein Response to Exercise

Total Costs: \$5,000

Role: **PI**

SC INBRE Bioinformatics SIRP September 2021 – September 2022

Title: Identifying Biological Signatures of Response to Regular Exercise

Total Costs: \$3,000

Role: **PI**

Not Funded

NIH F31 HL154534-01

Submitted August 8, 2020

Title: Molecular Foundations of Lipoprotein Response to Exercise

Role: **PI**

NIH F31 HL154534-01

Submitted December 19, 2019

Title: Proteomic Foundations of Lipoprotein Response to Exercise

Role: **PI**

Research

Manuscripts

Published:

9. Sarzynski MA, Rice T, Perusse L, Tremblay A, Stanforth PR, Tchernof A, **Barber JL**, Robbins JM, Ghosh S, Gerszten RE, Leon AS, Skinner JS, Rao DC, Bouchard C. The HERITAGE Family Study: A Review of the Effects of Exercise on Cardiometabolic Health. (Accepted: *Medicine & Science in Sports & Exercise*)

8. Ruiz-Ramie JJ, **Barber JL**, Lloyd-Jones DM, Lane-Cordova AD, Gross M, Rana JS, Sidney S, Jacobs DR, Sarzynski MA. Cardiovascular Health is Associated with Incidence of Elevated C-Reactive Protein over 18 Years of Follow-up: The Coronary Artery Risk Development in Young Adults Study. *Journal of American Heart Association* 2021; PMID: 34423651
7. Robbins JM, Peterson B, Schraner D, Tahir U, Rienmuller T, Keyes M, Katz D, Baumgartner C, Jean Beltran PM, Carr SA, Ghosh S, **Barber JL**, Sarzynski MA, Bouchard C, Gerszten RE. Plasma proteomic profiles of cardiorespiratory fitness. *Nature Metabolism* 2021; 3:786-797. PMID: 34045743.
6. **Barber JL**, Ruiz-Ramie JJ, Robbins JM, Gerszten RE, Leon AS, Rao DC, Skinner JS, Bouchard C, Sarzynski MA. Regular exercise and patterns of response across multiple cardiometabolic traits: the HERITAGE family study. *British Journal of Sports Medicine* 2021; 103323. PMID: 33619128.
5. Ross LM*, **Barber JL***, Sui X, Blair SN, Sarzynski MA. The Association of Cardiorespiratory Fitness and Ideal Cardiovascular Health in the Aerobics Center Longitudinal Study. *Journal of Physical Activity and Health* 2019; 24:1-8. PMID: 31553947. *denotes equal first authors
4. **Barber JL**, Zellars KN, Barringhaus KG, Bouchard C, Spinale FG, Sarzynski MA. The Effects of Regular Exercise on Circulating Cardiovascular-related MicroRNAs. *Scientific Reports* 2019; 9: 7527. PMID: 31101833.
3. Ruiz-Ramie JJ*, **Barber JL***, Sarzynski MA. Effects of Exercise on HDL functionality. *Current Opinions in Lipidology* 2019; 30: 16-23. PMID: 30480581. *denotes equal first authors
2. Sarzynski MA, Ruiz-Ramie JJ, **Barber JL**, Slentz CA, Apolzan JW, McGarrah RW, Harris M, Church TS, Martin CK, Kraus WE, Rohatgi A. The Effects of Increasing Exercise Intensity and Dose on Multiple Measures of High-Density Lipoprotein Function. *Arteriosclerosis, Thrombosis, and Vascular Biology* 2018; 38: 943-952. PMID: 29437573
1. **Barber JL**, Kraus WE, Church TS, Hagberg JM, Thompson PD, Bartlett DB, Beets MW, Earnest CP, Huffman KM, Landers-Ramos RQ, Leon AS, Rao DC, Seip RL, Skinner JS, Slentz CA, Wilund KR, Bouchard C, Sarzynski MA. Effects of Regular Endurance Exercise on GlycA: Combined Analysis of 14 Exercise Interventions. *Atherosclerosis* 2018; 277: 1-6. PMID: 30170218

In Review:

1. Hota M, **Barber JL**, Ruiz-Ramie JJ, Lam H, Robbins Jm, Gerszten RE, Schwartz CS, Sarzynski MA, Bouchard C, Ghosh S. A bioinformatics exploration of the biology of

intrinsic submaximal working capacity and its trainability. (Target Journal: *Journal of Applied Physiology*)

Book Chapters

Published:

1. **Barber JL** and Sarzynski MA. Heritability of Endurance Traits from Human Research Models. In: J.T. Lightfoot, Hubal M, and SM Roth (Eds): The Routledge Handbook of Sport and Exercise Systems Genetics. Taylor & Francis Group, New York, NY, 2019.

Published Abstracts/Refereed Presentations at Conferences

14. Ruiz-Ramie JJ, **Barber JL**, Lane-Cordova AD, Wang X, Wilkins JT, Johannsen NM, Sarzynski MA. Discordance Between HDL Cholesterol Versus Particle Concentration and Cardiovascular Risk Factor Profile in Adults with Type 2 Diabetes. Poster Presentation at American College of Sports Medicine Annual Meeting, June 2021
13. **Barber JL**, Cai G, Robbins JS, Rao P, Gerszten RE, Bouchard C, Sarzynski MA. Proteomic Predictors of High-Density Lipoprotein Cholesterol Response to Regular Exercise. Moderated Poster Presentation at the American Heart Association Epi/Lifestyle Scientific Sessions, May 2021
12. Jones A, **Barber JL**, Skinner JS, Bouchard C, Sarzynski MA. Differences in Body Composition at Baseline and in Response to Exercise Training by Metabolic Health and Weight Status. Oral presentation (by A Jones) at American Heart Association Epi/Lifestyle Scientific Sessions, May 2021
11. Jones A, **Barber JL**, Ayala EJ, Schwartz CS, Clarkson WA, Skinner JS, Bouchard C, Sarzynski MA. Cardiorespiratory fitness at baseline and in response to training Across metabolic health and weight phenotypes. Poster Presentation at SEACSM Virtual Meeting February 2021
10. Ayala EJ, **Barber JL**, Schwartz CS, Robbins JS, Gerszten RE, Wang X, Skinner JS, Bouchard C, Sarzynski MA. Clinical Predictors of VO₂max Response to Endurance Training: HERITAGE Family Study. Poster Presentation at SEACSM Virtual Meeting February 2021
9. **Barber JL**, Johannsen NM, Kraus WE, Church TS, Sarzynski MA. Effects of Aerobic and Resistance Training on the Lipoprotein Subclass Profile in Type 2 Diabetics. Poster Presentation at the National American College of Sports Medicine annual meeting, San Francisco, CA, May, 2020. *Medicine and Science in Sports and Exercise* 2020 52(7S):130-131.
8. Sarzynski MA, **Barber JL**, Ruiz-Ramie JJ, Robbins JM, Gerszten RE, Leon AS, Rao DC, Skinner JS, Bouchard C. Patterns of high and low response to regular exercise across multiple clinically relevant traits. *Medicine and Science in Sports*

and Exercise 2020 52(7S): 480–481.

7. **Barber JL**, Smoker BA, Bouchard C, Olivier M, Sarzynski MA (Presenter). Comparison of HDL and whole plasma proteomes. Poster presentation at HDL International Workshop, Valencia, Spain Sept. 26, 2019
6. **Barber JL**, Ruiz-Ramie JJ, Clarkson WA, Olivier M, Bouchard C, Rohatgi A, Sarzynski MA. Association of Exercise-Induced Changes in Cholesterol Efflux Capacity with Changes in the HDL Proteome.
 - **Oral Presentation** at The HDL Workshop, Boston, MA, May 17, 2019.
 - Poster presentation at American Heart Association Vascular Discovery: From Genes to Medicine, Boston, MA, May 15, 2019.
5. Sarzynski MA, Barupal DK, Showalter MR, **Barber JL**, Ruiz-Ramie JJ, Bouchard C, Fiehn O. Changes in the HDL Lipidome With Regular Exercise: a Pilot Study. Poster presentation at American Heart Association ATVB 2018 Scientific Sessions.
4. Ruiz-Ramie JJ, **Barber JL**, Lloyd-Jones DM, Lane-Cordova AD, Gross M, Rana JS, Sidney S, Jacobs DR, Sarzynski MA. Cardiovascular Health is Associated with Incidence of Elevated C-Reactive Protein over 18 Years of Follow-up: The Coronary Artery Risk Development in Young Adults Study. Poster presentation at American Heart Association Epi/Lifestyle 2018 Scientific Sessions
3. **Barber JL**, Zellars KN, Barringhaus KG, Bouchard C, Barringhaus KG, Sarzynski MA. The Effects of Exercise Training on Cardiovascular-related Circulating MicroRNAs. Poster presentation at American College of Sports Medicine Integrative Physiology of Exercise Meeting, San Diego, CA, September 7, 2018.
2. **Barber JL**, Ross LM, Sui X, Blair SN, Sarzynski MA. Change in Cardiorespiratory Fitness and Ideal Cardiovascular Health in the Aerobics Center Longitudinal Study. Poster Award Poster Finalist at Southeast American College of Sports Medicine Meeting, Greenville, SC, February 16, 2017, and poster presentation at National American College of Sports Medicine Meeting, Denver, CO, June 2, 2017.
1. Ross LM*, **Barber JL***, Sui X, Blair SN, Sarzynski MA. The Association of Cardiorespiratory Fitness and Ideal Cardiovascular Health in the Aerobics Center Longitudinal Study. Oral presentation (given by Dr. Sarzynski) at American Heart Association Epi/Lifestyle Annual Meeting, Portland, OR, March 10, 2017. *equal first authors

Teaching

Guest Lecturer, Pulmonary system physiology and gas transport, Physiology of Exercise (EXSC 780), Department of Exercise Science, University of South Carolina, October 11, 2017

Guest Lecturer, Resistance Training in Youth, How to Bust Exercise Myths: Evidence-Based Practice in Exercise Science (EXSC 555). Department of Exercise Science, University of South Carolina. March 22, 2018

Guest Lecturer, Glycolysis and the TCA cycle, Physiology of Exercise (EXSC 780), Department of Exercise Science, University of South Carolina, September 9, 2019.

Guest Lecturer, Cardiovascular Responses to Acute Exercise, Physiology of Exercise (EXSC 319), Department of Health and Human Performance, The Citadel, October 2020. (Delivered Online)

Mentoring (all at University of South Carolina)

Undergraduate Mentorship

Kaitlyn Muscarella, 2017

Emanuel Ayala, 2017-2019

William Clarkson, 2017-2018

Rama Hassouneh, 2017-2018

Milaan Shah, 2017-2018

Brice Smoker, 2018-2020

Andrew Hendrix, 2019-Present

Julianna Tyndall, 2020-2021

Katherine Kerwin, 2020-Present

Riley Reasons, 2020-Present

Secondary Mentor on Funded Research Grants

University of South Carolina Undergraduate Magellan Grant, “The Effects of One vs. Three Sessions of Exercise on Cholesterol Efflux”, \$3000, 2021

University of South Carolina Undergraduate Magellan Grant, “Time Course of Anti-Inflammatory Function of HDL Following Acute HIIT Exercise”, \$3000, 2019

University of South Carolina Undergraduate Magellan Grant, “HDL Anti-Inflammatory and Anti-Oxidative Responses to Endurance Exercise Training”, \$3000, 2018

Professional Service

Manuscript Reviewer:

Journal of Applied Physiology

Scandinavian Journal of Medicine and Science in Sports

Medicine & Science in Sports & Exercise

American Journal of Epidemiology

European Journal of Applied Physiology

Medicine & Science in Sports & Exercises

Lipids

Sports Medicine – Open

Volunteer Judge, 62nd USC Science and Engineering fair, University of South Carolina, March 16, 2018

Volunteer, UofSC Big Data Health Science Conference, Student Case Competition
February 7, 2021

Professional Development/Training

Attendee, Methodological Approaches for Whole Person Research Workshop, NCCIH.
September 2021.

Visiting Trainee, Duke University Medical School, April 2019.
Visited the labs of Dr. Bill Kraus to discuss collaborative work including ongoing papers and existing R01.

Visiting Trainee, University of Texas Southwestern Medical Center, June 2017
Visited the labs of Drs. Anand Rohatgi and Philip Shaul to learn the cholesterol efflux capacity assay and delipidation techniques. Attended lab meetings and engaged in discussion of ongoing R01 projects in the labs.

Attendee, Grant Writing Basics workshop, University of South Carolina. September 29, 2016

Professional Affiliations

American Heart Association, Council on Arteriosclerosis, Thrombosis, Vascular Biology, 2019-present

American College of Sports Medicine, 2017-present

Certifications and Skills

American Heart Association: Adult, Child, and Infant CPR/AED certified

Phlebotomy training at the University of South Carolina, Spring 2017

Laboratory Skills: RT-qPCR, RNA isolation, ELISA, cell culture, Cholesterol Efflux capacity assay, isolation of lipoproteins (e.g., HDL, LDL) using FPLC

R coding and bioinformatic analyses: Regularized regression, random forest, weighted gene co-expression network analysis (WGCNA), feature selection, linear mixed models, and pathway enrichment analysis.