
JACOB MATTHEW ALLEN, PHD

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, URBANA, IL 61802
DEPARTMENT OF KINESIOLOGY AND COMMUNITY HEALTH
MICROBIAL SYSTEMS INITIATIVE

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EDUCATION

2013-2017	DOCTOR OF PHILOSOPHY, University of Illinois at Urbana-Champaign Exercise Physiology; Area of focus: Microbiome
2011-2013	MASTER OF ARTS, University of North Carolina at Chapel Hill Exercise Physiology
2009-2011	BACHELOR OF ARTS, University of North Carolina at Chapel Hill Major: Exercise Physiology; Minor: Biology
2007-2009	BACHELOR OF SCIENCE, University of North Carolina at Wilmington Major: Biology; Transferred to University of North Carolina at Chapel Hill

POSITIONS AND EMPLOYMENT

2020-Present	ASSISTANT PROFESSOR, Department of Kinesiology and Community Health, Microbial Systems Initiative, University of Illinois at Urbana-Champaign, Urbana, IL
2020-Present	MEMBER, Microbial Systems Initiative, University of Illinois, Urbana-Champaign, IL
2020-Present	AFFILIATE Faculty, Institute for Genomic Biology (IGB), Microbiome and Metabolic Engineering (MME) theme. University of Illinois, Urbana-Champaign
2020-Present	AFFILIATE Faculty, Division of Nutritional Sciences (DNS). University of Illinois, Urbana-Champaign
2017-2020	POSTDOCTORAL SCIENTIST, Center for Microbial Pathogenesis Nationwide Children's Hospital (NCH), Columbus, OH
2013-2017	GRADUATE RESEARCH AND TEACHING ASSISTANT University of Illinois, Urbana-Champaign, IL
2011-2013	GRADUATE RESEARCH AND TEACHING ASSISTANT University of North Carolina, Chapel Hill, NC

PROFESSIONAL MEMBERSHIPS AND LEADERSHIP ROLES

2017-2020	CENTER REPRESENTATIVE FOR THE RESEARCH TRAINING ASSOCIATION (RITA), Nationwide Children's Hospital, Columbus, OH
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2017-2020	TRAINEE AMBASSADOR FOR THE CENTER FOR MICROBIAL PATHOGENESIS, Nationwide Children's Hospital, Columbus, OH
2017-2020	MEMBER, Infectious Disease Institute, The Ohio State University, Columbus, OH
2013-2017	INTEGRATIVE IMMUNOLOGY AND BEHAVIOR PROGRAM, University of Illinois, Urbana-Champaign, IL
2015- 2016	RESEARCH INTERN, Germ-Free Facility, Mayo Clinic, Rochester, MN
2014-Present	MEMBER, Psychoneuroimmunology Research Society
2011-Present	MEMBER, American College of Sports Medicine, Indianapolis, IN

RESEARCH EXPERIENCE

MANUSCRIPTS (1ST AUTHOR)

- a. **Allen J.M***, Mackos A.R., Davies R., Bailey M.T. (*Manuscript in Review*). Psychological stress disrupts intestinal epithelial cell function through microbe and host-directed processes. *Cell Reports*. Submitted April 2021
- b. **Allen J.M.**, Jagers R.M., Solden L.M., Loman B.R., Davies R.H., Mackos A.R., ... Bailey M.T. (2019). Dietary Oligosaccharides Attenuate Stress-Induced Disruptions in Immune Reactivity and Microbial B-Vitamin Metabolism. *Front Immunol*. doi:10.3389/fimmu.2019.01774.
- c. **Allen J.M.**, Mailing L.J., Niemi G.M., Moore R., Cook M.D., White B.A., . . . Woods J.A. (2018). Exercise Alters Gut Microbiota Composition and Function in Lean and Obese Humans. *Med Sci Sports Exerc*. doi: 10.1249/MSS.0000000000001495.
- d. **Allen J.M.**, Mailing L.J., Cohrs J., Salmonson C., Fryer J.D., Nehra V., . . . Woods J.A. (2017). Exercise training-induced modification of the gut microbiota persists after microbiota colonization and attenuates the response to chemically-induced colitis in gnotobiotic mice. *Gut Microbes*. doi: 10.1080/19490976.2017.1372077.
- e. **Allen J.M.**, Berg Miller M.E., Pence B.D., Whitlock K., Nehra V., Gaskins H.R., . . . Woods J.A. (2015). Voluntary and forced exercise differentially alters the gut microbiome in C57BL/6J mice. *J Appl Physiol*. doi: 10.1152/jappphysiol.01077.2014.

*Corresponding Author

MANUSCRIPTS (CO-AUTHOR)

- a. Mackos A.R., **Allen J.M.**, Kim E., Ladaika C.A., Gharaibeh R.Z., Moore C., Parry N.M., Boyaka P.N., Bailey M.T. (2019). Mice deficient in epithelial or myeloid cell IkkB have distinct microbiomes and increased resistance to *Citrobacter rodentium* infection. *Front Immunol*. doi: 10.3389/fimmu.2019.02062.
- b. Dettmer A.M., **Allen J.M.**, Jagers R.M., & Bailey M.T. (2019). A descriptive analysis of gut microbiota composition in differentially reared infant rhesus monkeys (*Macaca mulatta*) across the first 6 months of life. *Am J Primatol*. doi: 10.1002/ajp.22969.
- c. Mailing L.J., **Allen J.M.**, Pence B.D., Ryttych J., Sun Y., Bhattacharya T.K., . . . Woods J.A. (2019). Behavioral response to fiber feedings cohort-dependent and associated with gut microbiota composition in mice. *Behav Brain Res*. doi: 10.1016/j.bbr.2018.09.012.
- d. Mailing L.J., **Allen J.M.**, Buford T.W., Fields C.J., Woods J.A., (2019). Exercise and the Gut Microbiome: A Review of the Evidence, Potential Mechanisms, and Implications for Human Health. *Exerc Sport Sci Rev*. doi: 10.1249/JES.0000000000000183.

- e. Biruete A., **Allen J.M.**, Kistler B.M., Jeong J.H., Fitschen P.J., Swanson K.S., Wilund K.R. (2019). Gut microbiota and cardiometabolic risk factors in hemodialysis patients: A pilot study. *Top Clin Nutr.* doi: 10.1097/TIN.000000000000170.
- f. Gur T.L., Palkar A.V., Rajasekera T., **Allen J.M.**, Niraula A., Godbout J., & Bailey M.T. (2018). Prenatal stress disrupts social behavior, cortical neurobiology and commensal microbes in adult male offspring. *Behav Brain Res.* doi: 10.1016/j.bbr.2018.06.025.
- g. Niemi G.M., **Allen J.M.**, Mailing L.J., Khan N.A., Holscher H.D., Woods J.A., & De Lisio M. (2018). Effects of endurance exercise training on inflammatory circulating progenitor cell content in lean and obese adults. *J Physiol.* doi: 10.1113/JP276023.
- h. Matt S.M., **Allen J.M.**, Lawson M.A., Mailing L.J., Woods J.A., & Johnson R.W. (2018). Butyrate and Dietary Soluble Fiber Improve Neuroinflammation Associated With Aging in Mice. *Front Immunol.* doi: 10.3389/fimmu.2018.01832.
- i. Olson J.K., Navarro J.B., **Allen J.M.**, McCulloh C.J., Mashburn-Warren L., Wang Y., . . . Besner G.E. (2018). An enhanced *Lactobacillus reuteri* biofilm formulation that increases protection against experimental necrotizing enterocolitis. *Am J Physiol Gastrointest Liver Physiol.* doi: 10.1152/ajpgi.00078.2018.
- j. Nehra V., **Allen J.M.**, Mailing L.J., Kashyap P.C., Woods J.A. (2016). Gut microbiota: modulation of host physiology in obesity. *Physiology.* doi: 10.1152/physiol.00005.2016.
- k. Cook M.D., **Allen J.M.**, Pence B.D., Wallig M.A., Gaskins H.R., White B.A., & Woods J.A. (2016). Exercise and gut immune function: evidence of alterations in colon immune cell homeostasis and microbiome characteristics with exercise training. *Immunol Cell Biol.* doi: 10.1038/icb.2015.108.
- l. Panasevich M.R., **Allen J.M.**, Wallig M.A., Woods J.A., Dilger R.N. (2015). Moderately fermentable potato fiber attenuates signs and inflammation associated with experimental colitis in mice. *J Nutr.* doi: 10.3945/jn.115.218578.

BOOK CHAPTERS

- a. **Allen J.M.**, Sun Y., Woods J.A. (2015). Chapter Fourteen: Exercise and the Regulation of Inflammatory Responses. *Prog Mol Biol Transl Sci.* doi: 10.1016/bs.pmbts.2015.07.003.

ABSTRACTS (1ST AUTHOR)

- a. **Allen J.M.**, Mackos A.R., Jagers R.M. Bailey M.T. (2020). Stress initiates a pro-inflammatory transcriptional response in intestinal epithelial cells dependent on the gut microbiota. *College of Dentistry Research Day, The Ohio State University.*
- b. **Allen J.M.**, Jagers R.M., Solden L.M., Loman B.R., Mackos A.R., Ladaika C.A., Berg B.M., Chichlowski M., Bailey M.T. (2019). Dietary oligosaccharides attenuate stress-induced disruptions in immune reactivity and microbial B-vitamin metabolism. *Psychoneuroimmunology Research Society Annual Meeting.*
- c. **Allen J.M.**, Ladaika C.A., Navarro J.B., Goodman S.D., Besner G.E., Bailey M.T. (2018). A single dose of *Lactobacillus reuteri* induces rapid and transient accumulation of CD4+ intraepithelial lymphocytes in the mouse small intestine following antibiotic exposure. *Nationwide Children's Hospital Research Retreat.*
- d. **Allen J.M.**, Olson J.K., Navarro J.B., McCulloh C.J., Mashburn-Warren L., Varaljay V.A., Bailey M.T., Goodman S.D., Besner G.E. (2018). *Lactobacillus reuteri* adhered to dextranomer microsphere alters the gut microbiome and limits disease severity during experimental Necrotizing Enterocolitis in rats. *Keystone Symposia on the Gut Microbiota.*
- e. **Allen J.M.**, Kashyap P., Salmonson C., Fryer J., Nehra V., White B., Woods J.A. (2016). Exercise-induced changes in gut microbiota alters response to colitis in mice: Clinical scores and body weight differences. *Midwest Brain Behavior and Immunity Meeting.*

- f. **Allen J.M.**, Panasevich M.R., Pence B.D., Sun Y., Dilger R.N., Woods J.A. (2015). Acute exercise increases short chain fatty acid concentrations in the mouse cecum. *American College of Sports Medicine Conference*.
- g. **Allen J.M.**, Panasevich M.R., Pence B.D., Sun Y., Dilger R.N., Woods J.A. (2015). Acute exercise increases short chain fatty acid concentrations in the mouse cecum. *Midwest Brain Behavior and Immunity Meeting*. Invited speaker.
- h. **Allen J.M.**, Mailing L., Holscher H., Swanson K., Boardman L., Murray J., Jensen M., Nehra V., Woods J.A. (2015). Utilizing the gut microbiota to predict weight loss from a volumetric diet and exercise program in obese adults. *Mayo Clinic Individualizing Medicine Conference*.
- i. **Allen J.M.**, Berg-Miller M.E., Pence B.D., Whitlock K., Nehra N., Gaskins R., Fryer J.D., White B.A., Woods J.A. (2014). Forced and voluntary exercise differentially alters the microbiome in the feces and cecum of C57Bl/6J mice. *Mayo Clinic Individualizing Medicine Conference*.
- j. **Allen J.M.**, Wang J., Pence B.D., Cook M.D., Whitlock K., Molitor M., Woods J.A. (2014). Short bouts of voluntary wheel running reduce the inflammatory insult of ulcerative colitis in C57Bl/6J. *Psychoneuroimmunology Research Society Meeting*.
- k. **Allen J.M.**, Kang S.S., Jeraldo P.R., Kurti A., Berg-Miller M.E., Cook M.D., Whitlock K., Goldenfeld N., Woods J.A., White B.A., Chia N., Fryer J.D. (2014). High fat diet and exercise orthogonally alter the gut microbiome and reveal independent associations with anxiety and cognition. *University of Illinois Nutritional Sciences Symposium*.
- l. **Allen J.M.**, Pearson C., VanBruggen M., Battaglini C., Hackney A.C. (2013). Association between serum and salivary cortisol responses to varying exercise in endurance trained males. *Southeastern American College of Sports Medicine Conference*.

ABSTRACTS (CO-AUTHOR)

- a. Talavera M., **Allen J.M.**, Pool C., Liu Y., Nelin L., Bailey M.T. (2019). Mkp-1 deficiency shapes microbial intestinal diversity in neonatal mice. *Pediatric Academic Societies Meeting*.
- b. Mailing L.J., **Allen J.M.**, Wang S.S., Kashyap P., White B.A., Woods J.A. (2019). Effects of transplanting an exercised or sedentary microbiota into gnotobiotic mice on global gene expression in gut, muscle, and brain tissue. *FASEB Journal*, doi: 10.1096/fasebj.2019.33.1_supplement.lb293.
- c. Shelby R., Tengberg N., Conces M., Navarro J., **Allen J.M.**, Wang Y., Bailey M., Goodman S.D., Besner G.E. (2018). A novel probiotic platform therapy for the treatment of clostridium difficile colitis. *Podium presentation at the Annual Presidential Symposium of the Columbus Surgical Society*.
- d. Kurti S.P., **Allen J.M.**, Abella J., Mailing L.J., Woods J.A., Rosenkranz S.K., Harms C.A. (2018). The Impact of Physical Activity Level on the Oral Microbiome: A Cross-Sectional Investigation. *Medicine and Science in Sports and Exercise*. doi: 10.1249/01.mss.0000536380.91457.7d.
- e. Pence B.D., Bhattacharya T.K., Rytych J.L., Park P., **Allen J.M.**, Sun Y., McCusker R.H., Kelley K.W., Johnson R.W., Rhodes J.S., Woods J.A. (2016). Effects of dietary fiber and exercise on cognition, muscle function, and SCFA in young mice. *Medicine and Science in Sports and Exercise*. doi: 10.1249/01.mss.0000486569.15440.e0.
- f. Pence B.D., Bhattacharya T.K., Rytych J.L., Park P., **Allen J.M.**, Sun Y., McCusker R.H., Kelley K.W., Johnson R.W., Rhodes J.S., Woods J.A. (2016). Dietary fiber and exercise: Effects on muscle function, cognition, and short-chain fatty acids in mice. *FASEB Journal*, doi: 10.1096/fasebj.30.1_supplement.1287.5.
- g. Pence B.D., Bhattacharya T.K., Rytych J.L., Park P., **Allen J.M.**, Sun Y., McCusker R.H., Kelley K.W., Johnson R.W., Rhodes J.S., Woods J.A. (2016). EGCG decreases mortality in a dose-dependent fashion but does not improve cognition in mice. *FASEB Journal*, doi: 10.1096/fasebj.30.1_supplement.407.1.
- h. Biruete A., **Allen J.M.**, Kistler B.M., Jeong J.H., Fitschen P.J., Swanson K.S., Wilund K.R. (2016). Gut

microbiome and clinical risk factors in maintenance hemodialysis patients. *Nephrol Dial Transplant*.

- i. Woods J.A., **Allen J.M.**, Miller M.B., White B.A., Gaskins H., Nehra V. (2015). Exercise alters the gut microbiome and microbial metabolites: Implications for colorectal cancer and inflammatory bowel disease. *Midwest Brain Behavior and Immunity Meeting*.
- j. Panasevich M.R., **Allen J.M.**, Woods J.A., Dilger R.N. (2015). Moderately fermentable potato fiber attenuates symptoms during experimental colitis. *FASEB Journal*, doi: 10.1096/fasebj.29.1_supplement.265.2.
- k. Pence B.D., Bhattacharya T.K., Park P., Sun Y., Rytych J.L., **Allen J.M.**, McCusker R.H., Kelley K.W., Johnson R.W., Rhodes J.S., Woods J.A. (2015). A Diet Containing EGCG and Beta-Alanine Decreases Mortality and Improves Balance in Aged Mice, but Does Not Affect Cognitive Function. *FASEB Journal*, doi: 10.1096/fasebj.29.1_supplement.392.4.
- l. Graff R.G., **Allen J.M.**, Battaglini C.L., Mills R.C., Evans E.S., Ryan E.R., Hackney A.C. (2014). Leukocyte, leukocyte subsets and inflammatory cytokine responses to resistance exercise in breast cancer survivors. *Southeast American College of Sports Medicine Annual Meeting*.

CURRENT RESEARCH SUPPORT

2020/30/09-2021/08/31

R56-AG068747- National Institutes of Health (NIA)

Buford, Bailey, Woods (PIs)

Title: Age-Related Gut Dysbiosis and Physical Resilience

The purpose of this grant is to understand how the ageing gut microbiome modifies physical resilience. We will specifically examine how shifts in microbial metabolites mediate changes to muscle cachexia and physical frailty associated with ageing.

Status: In progress

Role: Co-Investigator

Award Amount: \$258,231

2020/01/08-2021/07/01

Metabolic Technologies, INC

Allen, Jacob (PI)

Title: Independent and combined effects of resistance exercise training and beta-hydroxy beta-methylbutyrate plus vitamin D3 on body composition and skeletal muscle health

Status: In progress.

Role: Principal Investigator

Award Amount: \$232,700

PENDING RESEARCH SUPPORT

2021

NIH RO1DK131133

Allen, Jacob (PI)

National Institute of Diabetes and Digestive and Kidney Diseases

Title: Role of epithelial ROS signaling in mediating psychological stress-induced mucosal dysfunction and infectious colitis predisposition

Council Review: June 2021

Role: Principal Investigator

Anticipated Award Amount: \$3.2 million

2021

NIH RO1- NIDDK

Wilund, Kenneth (PI)

National Institute of Diabetes and Digestive and Kidney Diseases

Title: HOME-delivered, Low-Sodium meals in hemo-Dialysis(HOME-LSD)

Submitted Feb 2021
Status: Council Review June 2021
Role: Co-Investigator
Anticipated Award Amount: \$3.6 million

2021

Center for Healthy Aging and Disability Pilot

Allen, Jacob (PI)

Title: *Gastrointestinal And Metabolic Effects from a Prebiotic, Lifting, and Aerobic iNtervention (GAMEPLAN)*

Submitted April 5th 2021

Status: Under Review

Role: Principal Investigator

Anticipated Award Amount: \$30,000

RESEARCH SUPPORT COMPLETED DURING LAST THREE YEARS

Jan 4, 2019 – March 30, 2022

T32 - RUTH L. KIRSCHSTEIN NATIONAL RESEARCH SERVICE AWARD

Allen, Jacob (PI)

NIDCR Comprehensive Training in Oral and Craniofacial Sciences Fellowship at The Ohio State University.

Title: "Stress and Gut Tryptophan Metabolism: Pathways of Disruption and Potential Avenues for Intervention".

The purpose of this grant was to unravel the how the stress modulates tryptophan metabolism within the the gut microbiota and the subsequent interactions between microbial tryptophan metabolites and host immunity

Role: Principal Investigator

Award amount: 3 years full salary support

July 1, 2018 – June 30, 2019

POSTDOCTORAL IDEA AWARD - NCH

Allen, Jacob (PI)

Title: "Understanding stress-induced modulation of tryptophan metabolism in host gut and resident microbiota: potential avenues for intervention".

The purpose of this grant was to unravel the how the stress modulates tryptophan metabolism within the the gut microbiota and the subsequent interactions between microbial tryptophan metabolites and host immunity.

Role: Principal Investigator

Award amount: \$20,0000

Jan 31, 2017 – Jan 30, 2018

INFECTIOUS DISEASE CONSORTIUM GRANT - NCH

Allen, Jacob (PI)

Title: "Effects of a probiotic delivery system on gut mucosal integrity during necrotizing enterocolitis in rats".

The purpose of this grant was to detail how a probiotic (*Lactobacillus reuteri*) modifies the colonic mucosal layer during necrotizing enterocolitis.

Role: Principal Investigator

Award amount: \$5,000

HONORS AND PRESENTATIONS

- 2021 Invited Speaker. 2021 'Biological Stress: From Cells to Societies' Symposium: Pathways in Biological Sciences (PIBS) at the University of California at San Diego (UCSD)
- 2020 Invited Speaker. 1st Inaugural Virtual Microbiome Summit. May 19-22, 2020.
www.virtualmicrobiomesummit.com
- 2020 Postdoctoral Fellow Award for Outstanding Presentation. The Ohio State's College of Dentistry Research Day. March 3rd, 2020. Columbus, OH.

- 2020 Invited Keynote Speaker to the 2020 2nd Annual Meeting Nutrition Forum sponsored by the Mexican Danone Institute. March 12th, 2020. Mexico City, Mexico.
- 2019 J.B. Russell Young Scientist Award for “Best Oral Presentation”. The Congress on Gastrointestinal Function. Chicago, IL.
- 2019 Invited Speaker. 2019 Infectious Disease Research Symposium at Nationwide Children’s Hospital, Columbus, OH.
- 2018 Invited Keynote Speaker. German Olympic Congress for Sports Medicine Specialists. Hamburg, Germany.
- 2016 Invited Speaker to PsychoNeuroImmunology Research Society Conference, Symposium: Behavior and the Microbiome. Brighton, England.
- 2016 Mayo Center for Individualized Medicine Conference Outstanding Paper Award, Rochester, MN.
- 2015 Mayo-UIUC Individualizing Medicine Conference Scholarship, Mayo-UIUC Alliance, Urbana, IL and Rochester, MN.
- 2014 Roger Morse Most Promising Graduate Student Award, University of Illinois, Urbana-Champaign, IL.
- 2014 Invited Speaker to Integrative Physiology and Exercise Conference, Symposium: Guts, Hearts and Smarts, Miami, FL.

TEACHING EXPERIENCE AND MENTORING

- 2020-21 Professor and Lecturer. University of Illinois at Urbana-Champaign. Kinesiology 352: Bioenergetics of Human Movement and Kinesiology 470: Exercise Endocrinology.
- 2020-21 Mentor for Undergraduate Research. University of Illinois at Urbana-Champaign. Kinesiology 385: Experience in Kinesiology Research.
- 2013-2017 Graduate Teaching Assistant University of Illinois at Urbana-Champaign: Bioenergetics.
- 2015 James Scholar Project Mentor, University of Illinois at Urbana-Champaign.
- 2013 Guest Lecturer, University of North Carolina at Chapel Hill: Endocrinology.
- 2011-2013 Graduate Teaching Assistant, University of North Carolina at Chapel Hill: Exercise Biochemistry.
- 2019 Primary Mentor for the Medical Student Research Scholarship at The Ohio State University Medical School. Mentee: Dante Pezzutti. Title: “The Effects of Stressor-Induced Hormones—Norepinephrine and Epinephrine—on the Immune Response to Bacterial Challenge within the Gastrointestinal Niche”.
- 2015 James Scholar Project Mentor, University of Illinois at Urbana-Champaign.
- 2013 Guest Lecturer, University of North Carolina at Chapel Hill: Endocrinology.
- 2011-2013 Graduate Teaching Assistant, University of North Carolina at Chapel Hill: Exercise Biochemistry.

SERVICE

VOLUNTEER

- 2021 Master of Ceremony and Presentation Judge. NSGSA Nutrition Symposium.
- 2020 Invited Panelist to the APC Ireland Microbiome Postdoc Association panel discussion: ‘How to land a job in Academia’.

2019 Poster Judge, Ohio State Science Fair.
2018-2019 Poster Judge, Undergraduate/Medical Student Research Day, Nationwide Children's Hospital.
2018-2019 Magic School Bus Learning Program, Nationwide Children's Hospital Outreach.
2017-2019 21st Century After-School Program, Nationwide Children's Hospital Outreach.
2012-2013 Get Real and Heel Breast Cancer Program, University of North Carolina at Chapel Hill.
2010-2011 Carolina Covenant Gives Back Scholarship Program, University of North Carolina at Chapel Hill.

JOURNAL REVIEWER

Journal of Applied Physiology

Brain Behavior and Immunity

Medicine and Science in Sports and Exercise (MSSE)

Plos One

FASEB

Scientific Reports

mSystems

Cellular Immunology

Nutritional Neurosciences

Journal of Gerontology

Journal of Physical Activity and Health