

## Melissa M Markofski, PhD

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### EDUCATION

Postdoctoral	<b>University of Texas Medical Branch</b> Sealy Center on Aging (nutrition and metabolism emphasis) Project: Nutrition and exercise to improve protein metabolism and prevent sarcopenia in aging	2010 - 2014
Ph.D.	<b>Purdue University</b> Health & Kinesiology (exercise physiology emphasis) Dissertation: Potential anti-inflammatory effects of exercise training with and without energy restriction-induced fat loss in older adults	2010
M.S.	<b>California State Polytechnic University, Pomona</b> Kinesiology (exercise physiology emphasis) Thesis: Influence of menstrual cycle phase on indices of exercise-induced muscle damage	2004
B.S.	<b>California State Polytechnic University, Pomona</b> Kinesiology	2000

### RESEARCH/ PROFESSIONAL EXPERIENCE

**University of Houston**, Houston, Texas, Dept. of Health and Human Performance  
**Assistant Professor**  
2014-present

**University of Texas Medical Branch, Galveston**, Sealy Center on Aging  
**Postdoctoral Fellow**  
2010-2014

*Nutrition and exercise to improve protein metabolism and prevent sarcopenia in aging*

Lead investigator for data collection

Collect human muscle biopsies

Exercise test subjects (VO<sub>2</sub>max, BioDex, functional measures)

Perform laboratory analysis (Western blotting, real time qPCR, ELISA, muscle metabolism)

Present data at scientific meetings

Co-mentor students and residents

2010-2014, *Skeletal muscle microvascular perfusion and the obesity paradox in chronic heart failure*

2012-2014, *A randomized, controlled double blind longitudinal study: effect of protein blend supplementation during exercise training on muscle growth and strength*

2013-2014, *Randomized controlled double blind acute study in older adults: effects of protein blends on muscle protein synthesis and breakdown*

2010-2014, *Nutritional and contractile regulation of muscle growth*

2012, *IL-6 and IL-10 Response to exercise in patients with traumatic brain injury*

2011-2012, *Randomized controlled double blind acute study in young adults: effects of protein blends on muscle protein synthesis and breakdown*

2010-2012, *Pilot study to discover predictors of muscle loss in aging*

2010-2012, *Pharmacologically increasing blood flow to influence skeletal muscle protein metabolism in healthy older adults*

**Purdue University, West Lafayette, Indiana Dept. of Health & Kinesiology**

**Research Assistant**

2006-2010 Dissertation research

2008-2009, *The impact of vitamin D supplementation on strength and lean mass accumulation during an exercise intervention*

2005-2007, *Exercise and Rosuvastatin treatment: is there an anti-inflammatory synergy?*

2006, *Physical activity, exercise training, and inflammation*

**California State Polytechnic University, Pomona, Dept. of Kinesiology**

**Research Assistant**

2002-2004, NIH-funded study

Project: Sensible therapies for osteoporosis prevention

**Olympic Athletic Club, Seattle, Washington**

**Fitness Specialist and Senior Advisor**

2000-2002

Coordinated senior fitness program and senior health events

**Overlake Hospital, Bellevue, Washington**

**Physical Therapy Aid**

2000-2001

Assisted Physical Therapists

**California State Department of Corrections, Rancho Cucamonga, California**

**Physical Testing & Evaluation Student Assistant**

1999-2000

Paid student internship

Assisted in administering physical abilities test to correctional officer applicants

**PUBLICATIONS (accepted)****Peer reviewed articles**

Graff RM, Kunz HE, Agha NH, Baker FL, Laughlin M, Bigley AB, **Markofski MM**, LaVoy EC, Katsanis E, Bond RA, Bollard CM, Simpson RJ.  $\beta$ 2-Adrenergic receptor signaling mediates the preferential mobilization of differentiated subsets of CD8+ T-cells, NK-cells and non-classical monocytes in response to acute exercise in humans. *Brain Behav Immun*. 2018 Aug 30. [Epub ahead of print] PMID: 30172948

Gupta P, Bigley AB, **Markofski M**, Laughlin M, LaVoy EC. Autologous serum collected 1 h post-exercise enhances natural killer cell cytotoxicity. *Brain Behav Immun*. 2018 Jul;71:81-92. PMID: 29656052

Hong J, Kim K, Park E, Lee J, **Markofski MM**, Marrelli SP, Park Y. Exercise ameliorates endoplasmic reticulum stress-mediated vascular dysfunction in mesenteric arteries in atherosclerosis. *Sci Rep*. 2018 May 21;8(1):7938. PMID: 29784903

**Markofski MM**, Jennings K, Timmerman KL, Dickinson JM, Fry CS, Borack MS, Reidy PT, Deer RR, Randolph A, Rasmussen BB, Volpi E. Effect of aerobic exercise training and essential amino acid supplementation for 24 weeks on physical function and muscle metabolism in healthy, independent older adults: a randomized clinical trial. *J Gerontol Med Sci*. Epub 2018 May 10. PMID: 29750251

Carrillo AE, **Markofski MM**, Flynn MG. Elevated inflammatory status and increased risk of chronic disease in chronological aging: Inflamm-aging or inflamm-inactivity? *Aging and Disease*. 2018 Dec; 9(6):xxx-xx

Agha NH, Baker FL, Kunz HE, Graff R, Azadan R, Dolan C, Laughlin MS, Hosing C, **Markofski MM**, Bond RA, Bollard CM, Simpson RJ. Vigorous exercise mobilizes CD34+ hematopoietic stem cells to peripheral blood via the  $\beta$ 2-adrenergic receptor. *Brain Behav Immun*. 2018 Feb;68:66-75. Epub 2017 Oct 7. PMID: 29017969

Arlinghaus KR, **Markofski MM**, Johnston CA. Reducing anxiety to increase exercise in individuals with decreased lung capacity. *Am J Lifestyle Med*. 2017 April;11(4):307-309.

Reidy PT, Borack MS, **Markofski MM**, Dickinson JM, Fry CS, Deer RR, Volpi E, Rasmussen BB. Post-absorptive muscle protein turnover affects resistance training hypertrophy. *Eur J Appl Physiol*. 2017 May;117(5):853-866. PMID: 28280974

**Markofski, MM**. Is ulcerative colitis a reversible disease? *Brain Behav Immun*. 2017 Jan;598-9. PMID: 27650111 (published online Sept. 2017)

Borack MS, Reidy PT, Husaini SH, **Markofski MM**, Deer RR, Richison AB, Lambert BS, Cope MB, Mukherjea R, Jennings K, Volpi E, Rasmussen BB. Soy-Dairy Protein Blend or Whey Protein Isolate Ingestion Induces Similar Postexercise Muscle Mechanistic Target of Rapamycin Complex 1 Signaling and Protein Synthesis Responses in Older Men. *J Nutr*. 2016 Dec; 146(12):2468-2475. PMID: 27798330

Reidy PT, Borack MS, **Markofski MM**, Dickinson JM, Deer RR, Husaini SH, Walker DK, Igbinigie S, Robertson SM, Cope MB, Mukherjea R, Hall-Porter JM, Jennings K, Volpi E, Rasmussen BB. Protein supplementation has minimal effect on muscle adaptations during resistance exercise training in young men: a double-blind randomized clinical trial. *J Nutr*. 2016 Sept; 146(9):1660-9. PMID: 27466602

**Markofski MM**, Dickinson JM, Drummond MJ, Fry CS, Fujita S, Gundermann DM, Glynn EL, Jennings K, Paddon-Jones D, Reidy PT, Sheffield-Moore M, Timmerman KL, Rasmussen, BB, and Volpi E. Effect of age on basal muscle protein synthesis and mTORC1 signaling in a large cohort of young and older men and women. *Exp Gerontol*. 2015 May;65:1-7. PMID: 25735236

Timmerman KL, Amonette WE, **Markofski MM**, Ansinelli HA, Gleason EA, Rasmussen BB, and Mossberg KA. Impaired IL-6 and IL-10 response to exercise in patients with traumatic brain injury. *Eur J Appl Physiol*. 2015 Jan;115(1):111-8.

**Markofski MM**, Flynn MG, Carrillo AE, Armstrong C, Campbell WW, and Sedlock, DA. Exercise training-induced decrease in circulating inflammatory CD14+CD16+ monocyte percentage with and without weight loss in overweight and obese adults. *Eur J Appl Physiol*. 2014 Aug;114(8):1737-48.

**Markofski MM** and Braun WA. Influence of menstrual cycle on indices of contraction-induced muscle damage. *J Strength Cond Res*. 2014 Sep;28(9):2649.

**Markofski MM**, Carrillo AE, Timmerman KL, Jennings K, Coen PM, and Flynn MG. Exercise training modifies ghrelin and adiponectin concentrations and is related to inflammation in older adults. *J Gerontol A Biol Sci Med Sci*. 2014 Jun;69(6):675-81.

Drummond MJ, Timmerman KL, **Markofski MM**, Walker DK, Dickinson JM, Jamaluddin M, Brasier AR, Rasmussen BB, Volpi E. Short-term bed rest increases TLR4 and IL-6 expression in skeletal muscle of older adults. *Am J Physiol Regul Integr Comp Physiol*. 2013 Aug 1;305(3):R216-23.

Carrillo AE, Flynn MG, Pinkston C, **Markofski MM**, Jiang Y, Donkin SS, Teegarden D. Impact of vitamin D supplementation during a resistance training intervention on body composition, muscle function, and glucose tolerance in overweight and obese adults. *Clin Nutr*. 2013 Jun;32(3):375-81

Drummond MJ, Dickinson JM, Fry CS, Walker DK, Gundermann DM, Reidy PT, Timmerman KL, **Markofski MM**, Paddon-Jones D, Rasmussen BB, Volpi E. Bed rest impairs skeletal muscle amino acid transporter expression, mTORC1 signaling, and protein synthesis in response to essential amino acids in older adults. *Am J Physiol Endocrinol Metab*. 2012 May 15;302(9):E1113-22.

Carrillo AE, Flynn MG, Pinkston C, **Markofski MM**, Jiang Y, Donkin SS, Teegarden D. Vitamin D supplementation during exercise training does not alter inflammatory biomarkers in overweight and obese subjects. *Eur J Appl Physiol*. 2012 Aug;112(8):3045-52

**Markofski MM** and Volpi E. Protein metabolism in women and men: similarities and disparities. *Curr Opin Clin Nutr Metab Care*. 2011 Jan;14(1):93-7.

Coen PM, Flynn MG, Markofski MM, Pence BD, Hannemann RE. Adding exercise to rosuvastatin treatment: influence on C-reactive protein, monocyte toll-like receptor 4 expression, and inflammatory monocyte (CD14+CD16+) population. *Metabolism*. 2010 Dec;59(12):1775-83.

Coen, PM. Flynn, MG, **Markofski, MM**, Pence, BD, Hannemann, RE. Adding exercise training to rosuvastatin treatment: influence on serum lipids and biomarkers of muscle and liver damage. *Metabolism*. 2009 Jul; 58(7):1030-8.

Timmerman KL, Flynn MG, Coen PM, **Markofski MM**, and Pence B. Influence of exercise training on CD14+CD16+ monocytes, toll-like receptor 4, and lipopolysaccharide-stimulated TNF $\alpha$ : production in elderly men and women. *J Leukoc Biol*. 2008 Nov; 84(5):1271-8.

Flynn MG, McFarlin BK, **Markofski MM**. The anti-inflammatory influence of exercise training. *Am J Lifestyle Med*. 2007 May-Jun; 1(3):220-35. PMID: 25431545

Braun WA, Hawthorne WE, **Markofski MM**. Acute EPOC response in women to circuit training and treadmill exercise of matched oxygen consumption. *Eur J Appl Physiol*. 2005 94(5-6):500-.

von Duvillard SP, Braun WA, **Markofski M**, Beneke R, Leithauser R. Fluids and hydration in prolonged endurance performance. *Nutrition*. 2004 Jul-Aug;20(7-8):651-6.

### Book chapters

**Markofski MM**, Coen PM, Flynn MG. Chronic exercise and immunity. Book chapter in *Lifestyle Medicine, 3rd edition*. Estimated publication date 2018.

### ABSTRACTS AND PRESENTATIONS

Brightwell CR, Moro T, Fry CS, **Markofski MM**, Volpi E, Rasmussen BB. Aerobic exercise training improves myofibrillar protein synthesis, capillarization, and quadriceps strength in older adults. American College of Sports Medicine annual meeting. Minneapolis, MN. May 30-June 2, 2018.

Love A, Dolan CT, **Markofski MM**. A comparison of self-reported physical activity to ActiGraph recorded physical activity amongst young adults. University of Houston Undergraduate Research Day. Houston, TX. October 12, 2017.

Dolan C, Jennings K, **Markofski MM**. Moderate Activity, not Light or Vigorous Activity is Associated with a Higher Percent of Circulating Classical Monocytes Positive for Cx3CR1 and CCR2. 13th ISEI Symposium. Coimbra, Portugal. July 11-14, 2017.

**Markofski MM**, Dolan C, Davies NA, Ryan EJ, Carrillo AE. BDNF decreases in response to an 8-week 'Paleo' diet intervention. 24th Annual PNIRS Scientific Meeting. Galveston, TX. June 7-10, 2017.

Agha NH, Baker FL, Kunz HE, Graff R, Azadan R, Dolan c, Laughlin MS, Hosing C, **Markofski MM**, Bond RA, Bollard CM, Simpson RJ. Vigorous exercise mobilizes CD34+ hematopoietic stem cells to peripheral blood via the  $\beta$ 2-adrenergic receptor. 24th Annual PNIRS Scientific Meeting. Galveston, TX. June 7-10, 2017.

**Markofski M**, Dolan C, Kunz H, Graff R, Agha N, Baker F, Mylabathula P, Simpson R. Effect of beta blockers on post-exercise cytokine response. Poster presented at American Physiological Society meeting on Inflammation, Immunity, and Cardiovascular Disease, Westminster, Colorado, August 24-27, 2016.

Dolan C, Carrillo A, Davies N, **Markofski M**. Effects of an 8-Week Paleo Dietary Intervention on Inflammatory Cytokines. Poster presented at American Physiological Society meeting on Inflammation, Immunity, and Cardiovascular Disease, Westminster, Colorado, August 24-27, 2016.

Borack MS, Reidy PT, Husaini SH, **Markofski MM**, Deer R, Cope MB, Mukherjea R, Jennings K, Volpi E, Rasmussen BB. Effect of Soy-Dairy Protein Blend Ingestion on Post-Exercise Muscle mTORC1 Signaling and Protein Synthesis in Older Adults. Presented at American Society for Nutrition Annual Scientific Sessions at Experimental Biology, San Diego, California, April 1-7, 2016.

Reidy PT, Borack MS, **Markofski MM**, Dickinson MM, Fry CS, Deer RR, Husaini SH, Volpi E, Rasmussen BB. Resistance exercise training induced muscle hypertrophy is partly modulated by basal post-absorptive muscle protein turnover. Presented at Muscle Biology Conference, Gainesville, Florida, January 20-22, 2016.

Borack MS, Dickinson JM, Reidy PT, Husaini SH, **Markofski MM**, Deer RR, Fry CS, Jennings K, Volpi E, Rasmussen BB. Amino Acid Sensing in C2C12 Cells and Human Skeletal Muscle. Presented at Muscle Biology Conference, Gainesville, Florida, January 20-22, 2016.

**Markofski MM**, Jennings K, Fisher SR, Rasmussen BB, and Volpi E. Supervised walking 3 times/week increases the weekly step activity in low active older adults. Poster presentation at American College of Sports Medicine annual meeting 2014. Orlando, FL (published abstract)

**Markofski MM**, Timmerman KL, Dickinson JM, Jennings K, Reidy PT, Borack M, Rasmussen BB, Volpi E. Higher sodium and saturated fat intake is associated with a lower basal muscle protein synthesis in older adults. Poster presentation at Experimental Biology 2014 meeting. San Diego, CA. (published abstract)

Reidy PT, Borack M, **Markofski MM**, Dickinson JM, Drummond MJ, Fry CS, Gundermann DM, Walker DK, Volpi E, Rasmussen BB. Inactivity from one overnight hospital stay reduces basal muscle protein synthesis in young adults. Poster presentation at Experimental Biology 2014 meeting. San Diego, CA. (published abstract)

**Markofski MM**, Timmerman KL, Dickinson JM, Reidy PT, Borack M, Rasmussen BB, and Volpi E. Exercise with Amino Acid Intake Increases Muscle Microvascular Perfusion in Older Adults. Poster presentation at American College of Sports Medicine annual meeting 2013. Indianapolis, IN (published abstract).

Dickinson JM, **Markofski MM**, Timmerman KL, Reidy PT, Borack M, Ding EH, Kauh BY, Rasmussen BB, and Volpi E. Aerobic Exercise Training and EAA Ingestion Increase Physical Function and Lean Mass in Older Adults. Poster presentation at American College of Sports Medicine annual meeting 2013. Indianapolis, IN (published abstract).

Timmerman KL, Amonette WE, **Markofski MM**, Ansinelli HA, Gleason EA, Rasmussen BB, and Mossberg KA. Impaired IL-6 and IL-10 Response to Aerobic Exercise in Patients Recovering from Traumatic Brain Injury. Potser presentation at American College of Sports Medicine annual meeting 2013. Indianapolis, IN (published abstract).

**Markofski MM**, Timmerman KL, Dickinson JM, Reidy PT, Borack M, Rasmussen BB, and Volpi E. The acute aerobic exercise-induced increase in amino acid transporter expression adapts to exercise training in older adults. Oral presentation at Experimental Biology 2013 meeting. Boston, MA. (published abstract)

**Markofski, MM**, Timmerman, KL, Dickinson, JM, Reidy, PT, Borack, MS, Walker, DK, Rasmussen, BB, and Volpi, E. Essential amino acid ingestion following aerobic exercise in older adults enhances skeletal muscle amino acid transporter expression. Poster presentation at Integrative Biology of Exercise meeting 2012, Westminster, CO (published abstract).

Timmerman, KL, **Markofski, MM**, West, JN, Timmerman, JZ, Dickinson, JM, Walker, DK, Gundermann, DM, Reidy, PT, Rasmussen, BB, and Volpi, E. Aerobic Exercise Training Reduces Skeletal Muscle Toll-like Receptor 4 And Inflammation In Older Adults. Poster presentation at American College of Sports Medicine annual meeting 2012, San Francisco, CA. (published abstract)

**Markofski MM**, Timmerman KL, Fujita S, Fry CS, Glynn EL, Drummond MJ, Dickenson JM, Reidy PT, Gundermann DM, Rasmussen BB, and Volpi E. Basal muscle protein synthesis is unaffected by sex in young and older adults. Oral presentation at Experimental Biology 2012 meeting. San Diego, CA. (published abstract)

**Markofski MM**, Timmerman KL, Reidy PT, Dickenson JM, Walker DK, Timmerman JZ, Rasmussen BB, and Volpi E. Acute aerobic exercise increases AdipoR1 and RAGE proteins and decreases HSP60 protein in skeletal muscle of physically inactive older adults. Poster presentation at Experimental Biology 2012 meeting. San Diego, CA. (published abstract).

Timmerman, KL, West, J, **Markofski, MM**, Dhanani, S, Rasmussen, BB, Choksi, KB, and Barbagelata, AN. Chronic Heart Failure is Associated with Elevated Skeletal Muscle Inflammation and Toll-Like Receptor 4 Signaling. Poster presentation at Experimental Biology 2012 meeting. San Diego, CA. (published abstract).

**Markofski MM**, Timmerman KL, Fry, CS, Dickinson, JM, Walker, DK, Rasmussen, BB, Volpi, E. Amino Acids Following Aerobic Exercise Enhances Muscle Protein Synthesis & mTORC1 Signals in Elders. Oral presentation at The Gerontological Society 2011 meeting. Boston, MA.

**Markofski MM**, Timmerman, KL, Rasmussen, BB, and Volpi, E. The ingestion of essential amino acids attenuated the aerobic exercise-induced increase in MCP1 and may interact with the mTORC signaling pathways in healthy older adults. Poster presentation at the International Society of Exercise and Immunology 2011 meeting. Oxford, England. (published abstract)

**Markofski MM**, Timmerman KL, Fry, CS, Dickinson, JM, Walker, DK, Rasmussen, BB, Volpi, E. Nutritional influences of muscle metabolism and function. Poster presentation at Experimental Biology 2011 meeting. Washington, DC. (published abstract)

**MM Markofski**, Timmerman, KL, Fry, CS, Rasmussen, BB, and Volpi, E. Effect of aerobic exercise and amino acid supplementation on mTORC1 signaling and muscle protein synthesis in older adults. 8<sup>th</sup> International Symposium on Amino Acid and Protein Metabolism in Health and Disease. Santa Margherita Ligure, Italy April 2011

**MM Markofski**, MG Flynn, DA Sedlock, WW Campbell, and AE Carrillo. Inflammatory monocyte (CD14+CD16+) percentage is high among physically inactive adults and highest in obese, inactive adults. Oral presentation at the International Society of Exercise and Immunology 2009 meeting. Tübingen, Germany. (published abstract)

**Markofski MM**, Flynn MG, Coen PM, and Hannemann RE. Statin plus exercise training: Markers of inflammation, liver function, and muscle damage. (2008). Published in *The Physiologist*. Poster Presentation - APS Intersociety Meeting, Integrative Physiology of Exercise, Hilton Head, SC.

Coen PM, Flynn MG, **Markofski MM**, Pence BD, Carrillo AE, Bell JW, and Hannemann RE. The Effect of Combined Statin Therapy and Exercise Training on Mediators of Inflammation. (2008). Published in *The Physiologist*. Poster Presentation - APS Intersociety Meeting, Integrative Physiology of Exercise, Hilton Head, SC.

**MM Markofski**, MG Flynn, KL Timmerman, PM Coen, B Pence. Exercise training increases adiponectin in elderly males and females. Poster presentation at the International Society of Exercise and Immunology 2007 meeting. Sendai, Japan. (published abstract)

Timmerman KL, MG Flynn, FACSM, PM Coen, **MM Markofski**, B Pence, N Woodall. The Influence of Physical Activity Level on Monocyte Subpopulations. ACSM Conference on the Integrative Physiology of Exercise. September 2006. Indianapolis, IN. (Published abstract)

Timmerman KL, MG Flynn, PM Coen, **MM Markofski**. Potential Mechanisms for the Anti-Inflammatory Effects of Exercise. Poster Presentation at the national conference for the Association of Gerontology in Higher Education. February 2006. Indianapolis, IN

**Markofski, MM**, WA Braun, and TW Spalding. Effect of Menstrual Cycle Variability on Indices of Exercise-Induced Muscle Damage. Presentation in June 2005 at annual meeting of the American College of Sports Medicine (Published abstract)

Braun, WA, M Liang, D Dutto, S Bassin, D Cooper, N Wong, S Arnaud, **M Markofski**, K Plesums, H Huynh. The Effects Of Exercise Training Mode On Biochemical Indices Of Bone Turnover And Bone Density In Untrained, Young Women. Poster presentation at June 2005 annual meeting of the American College of Sports Medicine (Published abstract)

**Markofski, MM**, WA Braun, MTC Liang, DD Dutto, SL Bassin, D Cooper, LD Moffatt, KE Plesums, H Huynh, and G Weidenfeld. Resistance training vs. step aerobics: Six month training. Poster presentation at June 2004 annual meeting of the American College of Sports Medicine (published abstract)

Moffatt, LD, WA Braun, MTC Liang, FACSM, DD Dutto, SL Bassin, D Cooper, **MM Markofski**, KE Plesums, and HT Huynh. Factors related to withdrawal from a long-term, exercise-based research



study. Poster presentation at June 2004 annual meeting of the American College of Sports Medicine (Published abstract)

Braun, WA and **MM Markofski**. Efficiency of compressive sleeve use for reducing DOMS symptoms following eccentric loading of the arm. Presentation in June 2004 at annual meeting of the American College of Sports Medicine (Published abstract)

**Markofski, MM**, and WA Braun. Effect of compressive sleeve use on DOMS. Presented at annual meeting of the Southwest Region of the American College of Sports Medicine, November 2003

## INVITED TALKS

2018 Exercise in Older Adults: What we know and how to apply it. Hot Topics in Aging, Consortium on Aging, Houston, TX 4/23/2018

## REVIEWER (2015-present)

### Journal Manuscripts

*Advances in Nutrition*

*American Journal of Lifestyle Medicine*

*Archives of Gerontology and Geriatrics*

*Brain, Behavior, and Immunity*

*Exercise and Immunology Review*

*Frontiers in Physiology*

*Healthcare*

*Immunity and Ageing*

*International Journal of Sports Physiology and Performance*

*Journal of Gerontology: Biological Sciences*

*Life Sciences*

*Medicine and Science in Sports and Exercise*

*Nutrition*

*PLOS ONE*

*Scientific Reports*

### Course Content

Module 1 of Health and Wellness Lab Manual (TopHat)

## SELECTED RECENT GRANT/ FUNDING SUBMISSIONS

### Funded

#### Active

NCI/NIH P20CA221696-02S1 – Pilot Research Program McNeill (PI) 9/1/2018 – 8/31/2020

UHAND (University of Houston/MD Anderson) Program to Reduce Cancer Disparities

PI: **Markofski, MM** (UH Subward)

Goal of my component: Examine the inflammation and cardiometabolic disease risk factors before and after a lifestyle intervention in prostate cancer patients in the watchful waiting period.

NIH NIA R03 PA-13-304 9/1/2017-8/31/2019

Title: Resistance Exercise to Improve Vaccine Outcomes in Older Adults

PI: LaVoy, E

Role: Co-investigator \$146,842

Overall Project Goal: Improve response of the annual flu vaccine in older adults.

**Completed**

Project/Proposal Title: The impact of modeled microgravity and prior radiation exposure on cytomegalovirus reactivation and host immune evasion

PI: Simpson, R.

Role: Co-investigator

Overall Project Goal: Evaluate the potential for astronaut CMV reactivation and subsequent potential detrimental health outcomes.

Source of Support: NASA Research Announcement (NRA) NNJ14ZSA001N

Total Award Amount: \$694,071 Amount proposed; budget was revised.

Total Award Period Covered: 7/1/2015–6/30/2017

Project/Proposal Title: Determining the relationship between physical fitness and disease in Chronic Lymphocytic Leukemia patients

PIs: LaVoy EC, **Markofski M**, Simpson RJ.

Overall Project Goal: Examine effects of lifestyle intervention in CLL patients on immune parameters.

Source of Support: CLASS Research Progress Grant

Total Award Amount Awarded: \$12,000

Total Award Period Covered: 7/2016-8/2017

Project/Proposal Title: Pattern of physical activity as a factor of risk for chronic diseases

PI: **Markofski, M.**

Overall Project Goal: Link biomarkers associated with type 2 diabetes and cardiovascular disease to physical activity.

Source of Support: CLASS Research Progress Grant

Total Award Amount Awarded: \$4,000

Total Award Period Covered: 7/1/2015-8/31/2016

NIH NIA Minority Supplement Grant

Submitted application – July 2010 (funded)

PI: Elena Volpi

Contribution: With Dr. Volpi's guidance, successfully wrote grant to supplement her R01 (AG030070) to fund 75% of my salary for almost two years

Purdue University Graduate School Bilsland Dissertation Fellowship (one year research assistantship)

Submitted application- March 2009 (funded)

PI: **Melissa Markofski**

Purdue Research Foundation Research Grant 2008-2009 (funded)

PI: M. Flynn

Internal grant to fund one-year research assistantship position while conducting dissertation research

Contribution: significant contribution to concept, research design, and writing

Purdue Research Foundation Research Grant 2006-2007 (funded)

PI: M. Flynn

Internal grant to fund one-year research assistantship position while conducting dissertation research

Contribution: significant contribution to concept, research design, and writing

**Submitted (pending)**

NIH NCI R03 PAR-18-021 (07/01/2019-06/31/2021)

Title: Role of resistance exercise in reducing risk for secondary diseases in cancer survivors

PI: **Markofski, MM**

Co-Is: Emily LaVoy, PhD, Kristofer Jennings PhD (UTMB)

Funding information: Directs and indirects (all years) = \$157,764

CLASS Research Progress Grant (07/01/2019-06/31/2021)

Title: Exercise-training induced changes in circulating biomarkers of metabolism in older women

PI: **Markofski, MM**

Funding information: \$4000

Women of Color Coalition Stimulus Research Grant Program (01/01/2019-12/31/2019)

Title: Immune and skeletal muscle response to an exercise session in cancer survivors

PI: **Markofski, MM**

Funding information: \$5000

**Submitted (not funded)**

Project/Proposal Title: The response of novel circulating immune and disease biomarkers to exercise

PIs: Markofski M. LaVoy EC

Overall Project Goal: Examine effects of an exercise intervention in pre-diabetic women on health and immune system.

Source of Support: CLASS Research Progress Grant

Total Award Amount Awarded: \$8,000 (submitted)      Total Award Period Covered: 9/15/2019-4/30/2019

Project/Proposal Title: Assessing the consumption of fermented and non-fermented dairy foods on biomarkers of inflammation in adults

PI: **Markofski, M.**

Role: PI

Overall Project Goal: A randomized, controlled trial to determine the relationship between chronic disease risk biomarkers and dairy or dairy alternatives products.

Source of Support: National Dairy Council Dairy Research Institute

Total Award Amount Requested: \$200,000 (not invited for full review)

Total Proposed Period Covered: 1/1/2018-12/31/2020

Project/Proposal Title: Identifying the response of biomarkers linked to cardiovascular disease and type 2 diabetes to cow's milk products or alternative "milk" products

PI: **Markofski, M.**

Role: PI

Overall Project Goal: A randomized, controlled trial to determine the relationship between chronic disease risk biomarkers and dairy or dairy alternatives products.

Source of Support: National Dairy Council Dairy Research Institute  
Total Award Amount Requested: \$200,000 (not invited for full review)  
Total Proposed Period Covered: 1/1/2018-12/31/2020

Project/Proposal Title: Use of dairy products to optimize gains in muscle strength and function during a targeted resistance exercise training program in older adults at risk for sarcopenia

PI: **Markofski, M.** and Lee, J.

Role: Co-PI

Overall Project Goal: Increase muscle strength and function in older adults through increased dairy consumption and home-based exercise training.

Source of Support: National Dairy Council Dairy Research Institute

Total Award Amount Requested: \$412,500 (not funded)

Total Proposed Period Covered: 1/1/2017-12/31/2019

Project/Proposal Title: Physical inactivity, not age, promotes atherosclerosis by encouraging pro-inflammatory monocyte interactions with the endothelium

PI: **Markofski, M.**

Overall Project Goal: Use exercise training to reduce biomarkers linked to CVD; explore potential mechanisms for this reduction.

Source of Support: American Heart Association Scientist Development Grant

Total Award Amount Requested: \$231,000 (not funded)

Total Proposed Period Covered: 1/1/2017-12/31/2019

Project/Proposal Title: Supplemental dietary soy protein with AHA exercise recommendations: potential differences between intensity recommendations

PI: **Markofski, M.**

Overall Project Goal: Use exercise training and soy protein supplementation to reduce biomarkers linked to CVD; explore potential mechanisms for this reduction.

Source of Support: American Heart Association Grant in Aid

Total Award Amount Requested: \$154,000 (not funded)

Total Proposed Period Covered: 1/1/2017-12/31/2018

Project/Proposal Title: Physical Activity Among Racial/Ethnic and Age-Diverse Individuals: Mapping Molecular Transducers

PI: Simpson, R and Basen-Engquist, K.

Role: Co-I

Overall project goal: Determine optimal dose of physical activity in young and older adults for health.

Source of Support: NIH common fund

Total Award Amount Requests: \$2,635,909 (not funded)

Total Proposed Period Covered: 9/1/2016-8/31/2022

Project/Proposal Title: Quantifying the anti-inflammatory effect of exercise training to reduce biomarkers associated with type 2 diabetes and cardiovascular disease development in older adults

PI: **Markofski, M.**

Overall Project Goal: Link biomarkers associated with type 2 diabetes and cardiovascular disease risk to physical activity and exercise training.

Source of Support: NIH NIA R03 PA-15-039

Total Award Amount Requested: \$148,548 (not funded)  
Total Proposed Period Covered: 4/1/2016-3/31/2018

Project/Proposal Title: Pattern of physical activity as a factor of risk for chronic diseases  
PI: **Markofski, M.**

Overall Project Goal: Link biomarkers associated with type 2 diabetes and cardiovascular disease risk to physical activity.

Source of Support: ACSM Paffenbarger-Blair Fund for Epidemiological Research on Physical Activity

Total Award Amount Requested: \$10,000 (not funded)

Total Proposed Period Covered: 7/1/2015-6/30/2017

Project/Proposal Title: Resistance Exercise to Improve Vaccine Outcomes in Older Adults

PI: LaVoy, E.

Role: Co-investigator

Overall Project Goal: Improve response of the annual flu vaccine in older adults.

Source of Support: NIH NIA R03 PA-13-304

Total Award Amount Requested: \$146,842 (not funded)

Total Proposed Period Covered: 4/1/2016-3/31/2018

Project/Proposal Title: QuBBD: Characterizing the Feature Space of High-frequency Accelerometry Monitoring with Relation to Biomarkers of Health

PI: Jennings, K.

Role: Co-investigator

Overall Project Goal: The objective of this project is to develop models of these long (more than 400,000 observations per individual), multi-dimensional functional signals by extracting sets of functional features that can be related to health status markers such as age, weight, and BMI.

Source of Support: NSF - Mathematical Sciences Infrastructure Program

Total Award Amount Requested: \$94,074 (not funded)

Total Proposed Period Covered: 11/1/2015 - 10/31/2016

Purdue University Graduate School Bilsland Dissertation Fellowship (one year research assistantship)

Submitted application- March 2008 (not funded)

PI: **Melissa Markofski**

#### **Travel awards (funded)**

Summer 2017 Provost's Travel Award (\$1200)

Summer 2016 Provost's Travel Award (\$1200)

Purdue Graduate Student Government Travel Grant 2008 (\$200)

Purdue Graduate Student Government Travel Grant 2007 (\$200)

Corrigan Professional Development Grant Fall 2007 (\$200)

#### **AWARDS/ HONORS/ FELLOWSHIPS**

**APS travel award for those who are underrepresented, minority, junior faculty** 2016

Travel award (\$300) to attend and present research at 2016 APS Conference: Inflammation, Immunity, and Cardiovascular Disease.

- University of Texas Medical Branch Forum on Aging Award** 2013  
Postdoctoral winner, Clinical Physiology Research category at annual research poster competition  
“Exercise with amino acid intake increases muscle microvascular perfusion in older adults.”
- American Society for Nutrition EMM RIS Student-Postdoc Award** 2013  
One of a few selected awards based on abstracts submitted to Experimental Biology 2013. Title of abstract was “The acute aerobic exercise-induced increase in amino acid transporter expression adapts to exercise training in older adults.”
- NIH Clinical Research LRP Award Recipient** 2011-2013
- Bilsland Dissertation Fellowship** 2009-2010  
Purdue University fellowship awarded to selected doctoral candidates in their final year of graduate school
- Health & Kinesiology Outstanding Engagement** 2007-2008  
Departmental graduate student award recognizing outstanding service in the department, campus, and community
- Carol J. Widule Award for Outstanding Graduate Scholar** 2006-2007  
Purdue University Department of Health & Kinesiology award
- Andrews Fellowship** 2004-2006  
Purdue University fellowship for recruitment of Ph.D. students
- Outstanding Graduate Student** 2003-2004  
Annual California State Polytechnic University, Pomona Department of Kinesiology annual award presented to one outstanding graduate student

**RESEARCH SKILLS**

Human muscle biopsy collection (5mm Bergström needle technique)  
Definity®(perflutren) contrast-enhanced ultrasound  
Doppler ultrasound  
Stable isotope tracer infusion and analysis  
Cell culture  
Western blotting  
Real time qPCR  
Flow cytometry  
ELISA and biochemical assays  
Exercise training and testing  
Subject recruitment  
Phlebotomy

## TEACHING EXPERIENCE

**University of Houston**, Dept. of Health & Human Performance

***Assistant Professor***

Instructor of record

PEP 8304 Journal Colloquium: Fall 2016

KIN 4370 Exercise Testing and Prescription: Fall 2018, Summer 2018, Spring 2018, Fall 2017, Summer 2017, Spring 2017, Fall 2016, Summer 2016

KIN 4397 Special Topics (Exercise for Special Populations): Spring 2016

PEP 8350 HHP Candidacy Project Research: Spring 2016

PEP 7397 (Contemporary Topics): Spring 2015

Guest

PEP 8303 HHP Research Seminar Class: Fall 2018, Fall 2017, Fall 2016, Fall 2015

PEP 8314 Doctoral Residency Seminar: Spring 2018, Spring 2017

**Purdue University**, Dept. of Health & Kinesiology

***Instructor***

Exercise Physiology I Lecture: Summer 2009

Exercise Physiology Laboratory: Spring 2008, Fall 2007, Spring 2006, Fall 2006

**California State Polytechnic University, Pomona** Dept. of Health & Kinesiology

***Instructor***

Exercise Physiology Laboratory (Fall 2002)

## PROFESSIONAL CERTIFICATIONS

Certified Strength and Conditioning Specialist (National Strength and Conditioning Association)  
CPR with AED

## PROFESSIONAL AFFILIATIONS

Sigma Xi, Member 2012-present

American Society of Nutrition, Member, 2010-present

International Society of Exercise and Immunology, Member, 2010-present

American Physiological Society, Member, 2003-present

American College of Sports Medicine, Member, 2003-present

Southwest Chapter, American College of Sports Medicine, Member, 2003-2004

Texas Chapter, American College of Sports Medicine, Member, 2015-present

American Heart Association, Member, 2016-2017

National Strength and Conditioning Association, Member, 2016-present

## **SERVICE**

### **Active**

**Member (alternate)**, University of Houston Committee for the Protection of Human Subjects, 2017-present

**Member**, University of Houston Dept. of Health and Human Performance Graduate Research Degrees committee, 2015-present

### **Completed**

**Member**, CLASS Graduate Affairs committee, 2016-2018

## **LEADERSHIP**

**Vice President**, Univ. of Texas Medical Branch Organization of Postdoctoral Scientists, 2010-2012

**Vice President**, Purdue Graduate Student Government, 2008-2009

**Treasurer**, Purdue Graduate Student Government, 2007-2008

**Chair**, Finance Committee, Purdue Graduate Student Government, 2007-2008

**Senator**, Purdue Graduate Student Government, 2006-2007

**Member**, Purdue University Recreational Sports Center Steering Committee, 2008-2010

**Member**, Economic Development Working Group, Purdue University Strategic Plan, 2007-2008

**Member**, Purdue University Spring Fling Planning Committee, 2006-2008

**Member**, Purdue University Student Appeals Board Member, 2006-2008

**Secretary/Treasurer**, Health & Kinesiology Graduate Student Organization, 2005-2006