

Curriculum Vitae

Professor

Micah J. Drummond, PhD

College of Health

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I. EDUCATION

Postdoc Skeletal Muscle Biology, University of Texas Medical Branch, 2006-2008
 PhD Exercise Sciences, Brigham Young University, 2001-2006
 MA Sport Sciences, University of the Pacific, 1999-2001
 BS Sports Medicine, California Lutheran University, 1998

II. EMPLOYMENT/POSITIONS

2023-Pres	University of Utah	Director of Graduate Studies, Rehabilitation Sciences
	Department of Physical Therapy & Athletic Training	
2022-Pres	Scientific Advisory Board, Immunis	
2021-Pres	University of Utah	Professor
	Department of Physical Therapy & Athletic Training	
2017-2021	University of Utah	Associate Professor
	Department of Physical Therapy & Athletic Training	
2016-Pres	University of Utah	
	Molecular Medicine Program Faculty Member	
2016-2023	University of Utah	Director
	Exercise Physiology and Mobility Laboratory, Clinical Services Core	
2015-Pres	University of Utah	Adjunct Professor
	Department of Pathology	
2014-Pres	University of Utah	Adjunct Professor
	Internal Medicine, Division of Endocrinology	
2012-2017	University of Utah	Assistant Professor
	Department of Physical Therapy	
2011-2012	University of Utah	Research Assistant Professor
	Department of Physical Therapy	
2011-Pres	University of Utah	Adjunct Professor
	Department of Nutrition and Integrative Physiology	
2011-Pres	University of Utah	Member
	Center on Aging	
2011	Institute for Translational Sciences	Core Faculty Member
	University of Texas Medical Branch	
2009-2011	Institute for Translational Sciences	Translational Research Scholar Career
	Development Program	
	University of Texas Medical Branch	
2008-2011	University of Texas Medical Branch	Assistant Professor
	Department of Physical Therapy/Nutrition and Metabolism	
	Galveston, Texas	

2008-2011	Sealy Center on Aging University of Texas Medical Branch	Fellow
2008-2011	Division of Rehabilitation Sciences School of Health Professions University of Texas Medical Branch	Core Faculty Member
2006-2008	University of Texas Medical Branch Department of Physical Therapy Galveston, Texas	Postdoctoral Fellow
2002-2006	Brigham Young University Provo, Utah	Anatomy Laboratory Instructor
2001-2006	Brigham Young University Provo, Utah	Research Assistant
2001-2006	Brigham Young University Provo, Utah	Exercise Physiology Laboratory Instructor
2001-2006	Brigham Young University Provo, Utah	Activity Course Instructor
2001-2002	American College of Sports Medicine Southwest Region	Student Representative
1999-2001	University of the Pacific Stockton, California	Exercise Physiology Laboratory Instructor
1999-2001	University of the Pacific Stockton, California	Activity Course Instructor
1999-2001	Muskal Institute Stockton, California	Tutor
1998-1999	Endocrine Sciences Calabasas, CA	Laboratory Assistant
1996-1998	California Lutheran University Thousand Oaks, CA	Anatomy and Physiology Laboratory Assistant

III. PROFESSIONAL AFFILIATIONS

2001-Pres	American College of Sports Medicine
2001-Pres	American Physiological Society
2014-Pres	American College of Sports Medicine (National & Regional- Southwest, Northwest)
2014-Pres	American Society of Nutrition
2012-2013	Gerontological Society of America
2018-2022	American Diabetes Association

IV. PUBLICATIONS (reverse chronological order)

Peer-Reviewed Journal Articles

1. Li Y, Bhagirath C, Rahman M, Kaddai V, Maschek JA, Berg J, Wilkerson JL, Mahmassani ZS, Cox JE, Wei P, Meikle PJ, Atkinson D, Wang L, Poss AM, Playdon MC, Tippetts TS, Mousa EM, Nittayaboon K, Velayutham A, **Drummond MJ**, Clevers H, Shayman JA, Hirabayashi Y, Holland WL, Rutter J, Edjar B, Summers SA. Ceramides increase fatty acid utilization in intestinal progenitors to enhance stemness and increase tumor risk, *Gastroenterology* [epub ahead of Print], 2023.
2. Shahtout JL, Eshima H, Ferrara PJ, Maschek JA, Cox JE, **Drummond MJ**, Funai K. Inhibition of skeletal muscle Lands cycle ameliorates weakness induced by physical inactivity. *bioRxiv*, 2023.
3. Petrocelli JJ, McKenzie AI, de Hart NMMP, Reidy PT, Mahmassani ZS, Keeble AR, Kaput KL, Wahl MP, Rondina MT, Marcus RL, Welt CK, Holland WL, Funai K, Fry CS, **Drummond MJ**. Disuse-induced

muscle fibrosis, cellular senescence and senescence-associated secretory phenotype in older adults are alleviated during re-ambulation with metformin pre-treatment. *Aging Cell* e13936, 2023.

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4. Reidy PT, Borack MS, Dickinson JM, Carroll C, Burd NA, **Drummond MJ**, Fry CS, Lambert B, Gundermann, DM, Glynn EL, Markofski MM, Timmerman KL, Moro T, Volpi E, Trappe S, Trappe TA, Harber MP, Rasmussen BB. Basal post-absorptive muscle protein synthesis is higher in outpatients as compared to inpatients. *Am J Phys, Endo Metab* [ePub ahead of Print], 2023.
5. Eshima H, Shahtout JL, Siripoksup P, Mackenzie PJ, Mahmassani ZS, Ferrara PJ, Lyons AW, Maschek JA, Peterlin AD, Verkerke ARP, Johnson JM, Salcedo A, Anderson EJ, Boudina S, Ran Q, Cox JE, **Drummond MJ**, Funai K. Lipid hydroperoxides promote sarcopenia through carbonyl stress. *eLife* e85289, 2023.
6. Petrocelli JJ, de Hart NMMP, Lang MJ, Yee EM, Ferrara PJ, Fix DK, Chaix A, Funai K, **Drummond MJ**. Cellular senescence and disrupted proteostasis induced by myotube atrophy is prevented with low dose metformin and leucine cocktail. *Aging* 15:1808-1832, 2023.

**Cover article*

7. Ferrara PJ, Reidy PT, Petrocelli JJ, Yee EM, Fix DK, Mahmassani ZS, Montgomery JA, McKenzie AI, de Hart NMMP, **Drummond MJ**. Global deletion of CCL2 has adverse impact on recovery of skeletal muscle fiber size and function and is muscle-specific. *Journal of Applied Physiology* 134: 923-932, 2023.
8. Ismaeel A, van Pelt D, Hettinger Z, Fu X, Richards CI, Butterfield T, Vechetti I, Confides A, **Drummond MJ**, Dupont-Versteegden EE. Extracellular vesicle distribution and localization in skeletal muscle at rest and following disuse atrophy. *Skeletal Muscle* 13:6, 2023.
9. Reidy PT, Smith AD, Jevnikar BE, Doctor A, Williams R, Kachulkin A, Monnig J, Perlman E, Fix DK, Petrocelli JJ, Mahmassani ZS, McKenzie AI, de Hart NMMP, **Drummond MJ**. Muscle disuse as hindlimb unloading in early postnatal mice negatively impacts grip strength in adult mice: A pilot study. *Journal of Applied Physiology* 134:787-798, 2023.
10. Ferrara PJ, Yee EM, Petrocelli JJ, Fix DK, Hauser CT, de Hart NMMP, Mahmassani ZS, Reidy PT, O'Connell RM, **Drummond MJ**. Macrophage immunomodulation accelerates skeletal muscle functional recovery in aged mice following disuse atrophy. *Journal of Applied Physiology* 133:919-931, 2022.

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11. McKenzie AI, Mahmassani ZS, Petrocelli JJ, DeHart Naomi MMP, Fix DK, Ferrara PJ, LaStayo PC, Marcus RL, Rondina RT, Summers SA, Johnson JM, Trinity JD, Funai K, **Drummond MJ**. Acute exposure to a clinical dose of metformin increases skeletal muscle mitochondrial H₂O₂ emission and production in healthy, older adults: A randomized controlled trial. *Experimental Gerontology* 163:111804, 2022.
12. Trinity JD, **Drummond MJ**, Fermoye C, McKenzie AI, Supiano MA, Richardson RS. Cardioasomobility: An Integrative Understanding of how Disuse Impacts Cardiovascular and Skeletal Muscle Health. *Journal of Applied Physiology* 132:835-861, 2022
13. Ferrara PJ, Veerkerke AARP, Maschek JA, Shahtout JL, Siripoksup P, Eshima H, Johnson JM, Petrocelli JJ, Mahmassani ZS, Green TD, Mclung JM, Cox JE, **Drummond MJ**, Funai K. Low lysophosphatidylcholine induces skeletal muscle myopathy that is aggravated by high-fat diet feeding. *FASEB J*, e21867, 2021.
14. Petrocelli JJ, Mahmassani, ZS, Fix DK, Montgomery JA, Reidy PT, McKenzie AI, DeHart NM, Ferrara PJ, Kelley JJ, Eshima H, Funai K, **Drummond MJ**. Metformin and Leucine increase Satellite Cells and Collagen Remodeling during Disuse and Recovery in Aged Muscle. *FASEB J*, 35: e21862, 2021.
15. Fix DK, Ekiz AH, Petrocelli JJ, McKenzie AI, Mahmassani ZS, O'Connell RO, **Drummond MJ**. Disrupted Macrophage Metabolic Reprogramming in Aged Soleus Muscle During Early Recovery following Disuse Atrophy. *Aging Cell* 20: e13448, 2021
16. Fix DK, Mahmassani ZS, Petrocelli JJ, DeHart NM, Ferrara PJ, Painter JS, Nistor G, Lane TE, Kierstead HS, **Drummond MJ**. Reversal of age-related deficits in skeletal muscle during disuse and

- recovery in response to treatment with a secretome product derived from partially differentiated human pluripotent stem cells. *GeroScience* 43: 2635-2652, 2021.
17. Mahmassani ZS, McKenzie AI, Petrocelli JJ, DeHart NM, Fix DK, Baird LM, Howard MT, **Drummond MJ**. Reduced Physical Activity Alters the Leucine-Stimulated Translatome in Aged Skeletal Muscle. *Journal of Gerontology*, 76:2112-2121, 2021.
 18. Ferrara PJ, Rong X, Maschek JA, Verkerke ARP, Siripoksup P, song H, Green TD, Krishnan KC, Johnson JM, Turk J, Houmard JA, Lusi AJ, **Drummond MJ**, McClung JM, Cox JE, Shaikh SR, Tontonoz P, Holland WL, Funai K. The Lands cycle Modulates Plasma Membrane Lipid Organization and Insulin Sensitivity in Skeletal Muscle. *Journal of Clinical Investigation*, 131: 135963, 2021.
 19. de Hart NM, Mahmassani ZS, Reidy PT, Kelley JJ, McKenzie AI, Petrocelli JJ, Bridge MJ, Baird LM, Bastian ED, Ward LS, Howard MT, **Drummond MJ**. Acute Effects of Cheddar Cheese on Circulating Amino Acids and Human Skeletal Muscle. *Nutrients*. 13: 614, 2021.
 20. Mahmassani ZS, McKenzie AI, Petrocelli JJ, de Hart NM, Reidy PT, Fix DK, Ferrara PJ, Funai k, **Drummond MJ**. Short-Term Metformin Ingestion by Healthy Older Adults Improves Myoblast Function. *American Journal of Physiology, Cell Physiology*, 320: C566-C576, 2021
 21. Reidy PT, Monning JM, Pickering CE, Funai K, **Drummond MJ**. Pre-Clinical Rodent Models of Physical Inactivity-Induced Muscle Insulin Resistance: Challenges and Solutions. *Journal of Applied Physiology*, 130: 537-544, 2020.
 22. Petrocelli JJ, **Drummond MJ**. PGC1 α -Targeted Therapeutic Approaches to enhance Muscle Recovery in Aging. *International Journal of environmental Research and Public Health*, 21:8650, 2020.
 23. Eshima H, Siripoksup P, Mahmassani Z, Johnson J, Ferrara P, Verkerke A, Salcedo A, **Drummond MJ**, Funai K. Neutralizing mitochondrial ROS does not rescue muscle atrophy induced by hindlimb unloading in female mice. *Journal of Applied Physiology* 129: 124-132, 2020.
 24. Reidy PT, Edvalson L, McKenzie AI, Petrocelli JJ, Mahmassani ZS, **Drummond MJ**. A combined neuromuscular electrical stimulation and protein countermeasure during bed rest increased CD11b+ skeletal muscle macrophages but did not correspond to muscle size or insulin sensitivity. *Applied Physiology, Nutrition and Metabolism*, 45: 1261-1269, 2020.
 25. Petrocelli JJ, McKenzie AI, Mahmassani ZS, Reidy PT, Stoddard GS, Poss A, Holland WL, Summers SA, **Drummond MJ**. Ceramide biomarkers predictive of cardiovascular disease risk increase in healthy older adults after bed rest. *Journal of Gerontology: Biological Sciences*, 75: 1663-1670, 2020.
 26. Ekiz HA, Ramstead AG, Lee SH, Nelson MC, Bauer KM, Wallace JA, Hu R, Round JL, Rutter J, **Drummond MJ**, Rao DS, O'Connell RM. T-cell expressed microRNA-155 reduces lifespan in a mouse model of age-related chronic inflammation. *Journal of Immunology*, 204:2064-2075, 2020.
 27. Mahmassani ZS, Reidy PT, McKenzie AI, Petrocelli JJ, Mathews O, DeHart NM, Ferrara PJ, O'Connell RM, **Drummond MJ**. Absence of MyD88 from Skeletal Muscle Protects Female Mice from Inactivity-Induced Adiposity and Insulin Resistance. *Obesity*, 28:772-782, 2020.
 28. Reidy PT, Mahmassani ZS, McKenzie AI, Petrocelli JJ, Summers SA, **Drummond MJ**. Influence of Exercise Training on Skeletal Muscle Insulin Resistance in Aging: Spotlight on Muscle Ceramides. *International Journal of Molecular Science*, 21: 1514, 2020.
 29. McKenzie AI, Reidy PT, Nelson DS, Mulvey JL, Yonemura NM, Petrocelli JJ, Mahmassani ZS, Tippetts TS, Summers SA, Funai K, **Drummond MJ**. Pharmacological inhibition of TLR4 ameliorates muscle and liver ceramide content after disuse in previously physical active mice. *American Journal of Physiology, Regulatory, Integrative and Comparative Physiology*, 318: R503-R511, 2020.
 30. Venturelli M, Schena F, Naro F, Reggiani C, Pereira Guimarães M, de Almeida Costa Campos Y, Costa Moreira O, Fernandes da Silva S, Silva Marques de Azevedo PH, Dixit A, Srivastav S, Hinkley JM, Seaborne RA, Viggars M, Sharples AP, Mahmassani ZS, **Drummond MJ**, Gondin J. Commentaries on Viewpoint: "Muscle Memory" not mediated by myonuclear number? Secondary analysis of human detraining data. *Journal of Applied Physiology*, 127: 1817-1820, 2019.

31. Reidy PT, Dupont-Versteegden E, **Drummond MJ**. Macrophage regulation of skeletal muscle regrowth in aging. *Exercise and Sport Sciences Review*, 47; 246-250, 2019
32. Heden TD, Johnson JM, Ferrara PJ, Eshima H., Verkerke A, Wentzler EJ, Siripoksup P., Narowski TM, Coleman CB, Lin C. Ryan TE, Reidy PT, de Castro Bras LE, Karner CM, Burant CF, Maschek A, Cox JE, Mashek DG, Kardon G. Boudina S. Zeczycki TN, Rutter J, Shaikh SR, Vance JE, **Drummond MJ**, Neuffer PD, Funai K. Mitochondrial PE potentiates respiratory enzymes to amplify skeletal muscle aerobic capacity *Science Advances*, 5: eaax8352, 2019
33. Reidy PT, McKenzie AI, Mahmassani ZS, Petrocelli JJ, Nelson DB, Lindsay CC, Gardner JE, Morrow VR, Keefe AC, Huffaker TB, Stoddard GJ, Kardon G, O'Connell RM, **Drummond MJ**. Aging impairs mouse skeletal muscle macrophage polarization and muscle-specific abundance during recovery from disuse. *American Journal of Physiology, Endocrinology and Metabolism*, 317: E85-E98, 2019.
34. Runtsch MC, Nelson MC, Lee SH, Voth W, Alexander M, Hu R, Wallace J, Petersen C, Panic V, Vilanueva CJ, Evason KJ, Bauer KM, Mosbrugger T, Bodina S, Bronner M, Round JL, **Drummond MJ**, O'Connell RM. Anti-inflammatory microRNA-146a protects mice from diet-induced metabolic disease. *PLoS Genetics*, 15: e1007970, 2019.
35. Mahmassani ZS, Reidy PT, McKenzie AI, Stubben C, Howard MT, **Drummond MJ**. Disuse-induced insulin resistance susceptibility coincides with a dysregulated skeletal muscle metabolic transcriptome. *Journal of Applied Physiology*, 126:1419-1429, 2019.
36. Reidy PT, Yonemura NM, Madsen JH, McKenzie AI, Mahmassani ZS, Rondina MT, Lin YK, Kaput K, **Drummond MJ**. An accumulation of muscle macrophages is accompanied by altered insulin sensitivity after reduced activity and recovery. *Acta Physiologica*, 226:e13251, 2019.
37. Mahmassani ZS, Reidy PT, McKenzie AI, Stubben C, Howard MT, **Drummond MJ**. Age-dependent skeletal muscle transcriptome response to bed rest-induced atrophy. *Journal of Applied Physiology*, 126:894-902, 2019.
38. Reidy PT, McKenzie AI, Mahmassani Z, Morrow VR, Yonemura N, Hopkins PN, Marcus RL, Rondina MT, Lin YK, **Drummond MJ**. Skeletal Muscle Ceramides and Relationship to Insulin Sensitivity after Two Weeks of Simulated Sedentary Behavior and Recovery in Healthy Older Adults, *Journal of Physiology* 596: 5217-5236, 2018.
39. Briggs RA, Houck JR, LaStayo PC, Fritz JM, **Drummond MJ**, Marcus RL. High-Intensity Multimodal Resistance Training Improves Muscle Function, Symmetry during a Sit-to-Stand Task, and Physical Function Following Hip Fracture. *Journal of Nutrition and Healthy Aging*, 22: 431-438, 2018.
40. Briggs RA, Houck JR, **Drummond MJ**, Fritz JM, LaStayo PC, Marcus RL. Muscle Quality Improves with Extended High-Intensity Resistance Training after Hip Fracture. *Journal of Frailty and Aging*, 7: 51-56, 2018.
41. Agergaard J, Bülow J, Jensen JK, Reitelseder S, Borno A, **Drummond MJ**, Schjerling P, Holm L. Effect of light-load resistance exercise on postprandial amino acid transporter expression in elderly men. *Physiological Reports*, 5: 313444, 2017.
42. Reidy PT, Lindsay CC, McKenzie AI, Fry CS, Supiano MA, Marcus RL, LaStayo PC, **Drummond MJ**. Aging-related effects of bed rest followed by eccentric exercise rehabilitation on skeletal muscle macrophages and insulin sensitivity. *Experimental Gerontology*, 107: 37-49, 2018
43. **Drummond MJ**, Reidy PT, Baird LM, Dalley BK, Howard MT. Leucine Differentially Regulates Gene-Specific Translation in Mouse Skeletal Muscle. *Journal of Nutrition*, 147: 1616-1623, 2017
44. Reidy PT, McKenzie AI, Brunner P, Nelson DS, Barrows KM, Supiano M, LaStayo PC, **Drummond MJ**. Neuromuscular Electrical Stimulation Combined with Protein Ingestion Preserves Thigh Muscle Mass But Not Muscle Function in Healthy Older Adults during 5-days of Bed Rest. *Rejuvenation Research*, 20:449-461, 2017.

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45. Briggs RA, Houck JR, **Drummond MJ**, Fritz JM, LaStayo PC, Marcus RL. Asymmetries Identified in Sit-to-Stand Task Explain Physical Function After Hip Fracture. *Journal of Geriatric Physical Therapy*, 41: 210-217, 2018.
46. Reidy PT, Fry CS, Dickinson JM, **Drummond MJ**, Rasmussen BB Postexercise essential amino acid supplementation amplifies skeletal muscle satellite cell proliferation in older men 24 hours postexercise. *Physiological Reports*, 5: e13269, 2017
47. McKenzie AI, Briggs RA, Barrows KM, Nelson DS, Kwon OS, Hopkins PN, Higgins TF, Marcus RL, **Drummond MJ**. A pilot study examining the impact of exercise training on skeletal muscle genes related to the TLR signaling pathway in older adults following hip fracture recovery *Journal of Applied Physiology*. 122: 68-75, 2017.
48. Agergaard J, Bülow J, Jensen JK, Reitelseder S, **Drummond MJ**, Schjerling P, Scheike T, Serena A, Holm L. Light-load resistance exercise increases muscle protein synthesis and hypertrophy signaling in elderly men. *American Journal of Physiology, Endocrinology and Metabolism*. 312: E326-338, 2017.
49. Kwon OS, Nelson DS, Barrows KM, O'Connell RM, **Drummond MJ**. Intramyocellular ceramides and skeletal muscle mitochondrial respiration are partially regulated by Toll-like receptor 4 during hindlimb unloading. *American Journal of Physiology, Regulatory, Integrative, Comparative Physiology*, 311: R879-R887, 2016.
50. Coble, J., R. Schilder, A. Berg, **M.J. Drummond**, B.B. Rasmussen, S. Kimball. Influence of ageing and essential amino acids on quantitative patterns of troponin T alternative splicing in human skeletal muscle. *Applied Physiology, Nutrition and Metabolism*. 40: 788-796, 2015
51. Tanner, R.E., L. Bruncker, J. Agergaard, K. Barrows, R. Briggs, O. Kwon, L. Young, P. Hopkins, E. Volpi, R. Marcus, P. LaStayo, **M.J. Drummond**. Age-related differences in leg lean mass, protein synthesis and skeletal muscle markers of proteolysis after bed rest and exercise rehabilitation. *Journal of Physiology*. 593: 4259-4273. 2015.
52. Kwon, O.S, R.E. Tanner, K.M. Barrows, M. Runtsch, J.D. Symons, T. Jalili, B.T. Bikman, D.A. McClain, R.M. O'Connell, **M.J. Drummond**. MyD88 regulates physical inactivity-induced skeletal muscle inflammation, ceramide biosynthesis signaling and glucose intolerance. *American Journal of Physiology, Endocrinology and Metabolism*. 309: E11-E21. 2015.
53. Markofski, M.M., J.M. Dickinson, **M.J. Drummond**, C.S. Fry, S. Fujita, D.M. Gundermann, E.L. Glynn, K. Jennings, D. Paddon-Jones, P.T. Reidy, M. Sheffield-Moore, K.L. Timmerman, B.B. Rasmussen, E. Volpi. Effect of age on basal muscle protein synthesis and mTORC1 signaling in a large cohort of young and older men and women. *Experimental Gerontology* 65: 1-7, 2015.
54. Dickinson, J.M., D.M. Gundermann, D.K. Walker, P.T. Reidy, M.S. Borack, **M.J. Drummond**, M. Arora, E. Volpi, B.B. Rasmussen. Leucine-enriched amino acid ingestion after resistance exercise prolongs myofibrillar protein synthesis and amino acid transporter expression in older men. *The Journal of Nutrition* 144: 1694-702, 2014.
55. Carlin, M. R.E. Tanner, J. Agergaard, T. Jalili, D.A. McClain, **M.J. Drummond**. Skeletal muscle RAGB mRNA and protein expression is increased following essential amino acid ingestion in healthy humans, *The Journal of Nutrition*, 144: 1409-1414, 2014.
56. Reidy, P, D. Walker, J. Dickinson, D. Gundermann, **M.J. Drummond**, K. Timmerman, M. Cope, R. Mukherjea, K. Jennings, E. Volpi, B. Rasmussen. Soy-Dairy Protein Blend and Whey Protein Ingestion after Resistance Exercise Increases Amino Acid Transport and Transporter Expression in Human Skeletal Muscle. *Journal of Applied Physiology*, 116: 1353-1364, 2014.
57. Walker, D, **M.J. Drummond**, J.M. Dickinson, M Borack, K. Jennings, E. Volpi, B.B. Rasmussen. Insulin increases mRNA abundance of the amino acid transporter SLC7A5/LAT1 via an mTORC1 dependent mechanism in skeletal muscle cells, *Physiological Reports*, 2(3): e00238, 2014.

58. Addison, O., **M.J. Drummond**, P.C. LaStayo, L.E. Dibble, A.R. Wende, D.A. McClain, R.L. Marcus. Intramuscular fat and inflammation differ in older adults: The impact of frailty and inactivity, *The Journal of Nutrition, Health and Aging*, 18: 532-538, 2014.
59. Wing-Gaia, S.L., D.C. Gershonoff, **M.J. Drummond**, P.F. Gaia, E.W. Askew. Effect of leucine supplementation on fat free mass with prolonged hypoxic exposure during a 13-day trek to Everest base Camp: a double-blind randomized study. *Applied Physiology, Nutrition and Metabolism*, 39: 318-323, 2014.
60. **Drummond M.J.**, A. Addison, L. Bruncker, P.N. Hopkins, D.A. McClain, P.C. LaStayo, R.L. Marcus. Down-regulation of E3 ubiquitin ligases and mitophagy-related genes in skeletal muscle of physically inactive, frail older women: A cross-sectional comparison. *Journal of Gerontology Series A Biological Sciences and Medical Sciences*, 69: 1040-1048, 2014.
61. **Drummond, M.J.**, K.L. Timmerman, M.M. Markofski, D.K. Walker, J.M. Dickinson, M. Jamaluddin, A.R. Brasier, B.B. Rasmussen, E. Volpi. Short-term bed rest increases TLR4 and IL-6 expression in skeletal muscle of older adults. *American Journal of Physiology, Regulatory, Integrative, and Comparative Physiology*, 305: R216-R223, 2013.
62. Glynn, E.L., C.S., Fry, K.L. Timmerman, **M.J. Drummond**, E. Volpi, B.B. Rasmussen. Addition of carbohydrate or alanine to an essential amino acid mixture does not enhance human skeletal muscle protein anabolism. *Journal of Nutrition*, 143: 307-314, 2013.
63. Reidy P.T., D.K. Walker, J.M. Dickinson, D.M. Gundermann, **M.J. Drummond**, K.L. Timmerman, C.S. Fry, M.S. Borack, M.B. Cope, R. Mukherjea, K. Jennings, E. Volpi, B.B. Rasmussen. Protein Blend ingestion following resistance exercise promotes human muscle protein synthesis. *Journal of Nutrition* 143:410-416, 2013.
64. Dickinson, J.M., **M.J. Drummond**, C.S. Fry, D.M. Gundermann, D.K. Walker, K.L. Timmerman, E. Volpi, B.B. Rasmussen. Rapamycin does not affect post-absorptive protein metabolism in human skeletal muscle. *Metabolism*. 62:144-51, 2013.
65. Dickinson, J.M., **M.J. Drummond**, J.R. Coben, E. Volpi, and B.B. Rasmussen. Aging differentially affects human skeletal muscle amino acid transporter expression when essential amino acids are ingested after exercise. *Clinical Nutrition*. 32: 273-280, 2013.
66. Fry, C.S., **M.J. Drummond**, E.L. Glynn, J.M. Dickinson, D.M. Gundermann, K.L. Timmerman, D.K. Walker, E. Volpi, B.B. Rasmussen. Skeletal muscle autophagy and protein breakdown following resistance exercise are similar in young and older adults. *The Journals of Gerontology: Series A, Biological Sciences and Medical Sciences*, 68: 599-607, 2013.
67. Fry, C.S., **M.J. Drummond**, H.L. Lugan, S.E. DiCarlo, and B.B. Rasmussen. Paraplegia increases skeletal muscle autophagy. *Muscle and Nerve*, 46: 793-798, 2012.
68. Timmerman, K.L., S. Dhanani, E.L. Glynn, C.S. Fry, **M.J. Drummond**, K. Jennings, B.B. Rasmussen, E. Volpi. A moderate acute increase in physical activity enhances nutritive flow and the muscle protein anabolic response to a mixed meal in older adults, *American Journal of Clinical Nutrition*. 95:1403-1412, 2012
69. **Drummond, M.J.**, J.M. Dickinson, C.S. Fry, D.K. Walker, D.M. Gundermann, P.T. Reidy, K.L. Timmerman, M.M. Markofski, D. Paddon-Jones, B.B. Rasmussen, and E. Volpi. Bed rest impairs skeletal muscle mTORC1 signaling, amino acid transporter expression and protein synthesis in response to essential amino acid in older adults. *American Journal of Physiology, Endocrinology*, 302:E1113-E1122, 2012
70. Gunderman, D.M., C.S. Fry, J.M. Dickinson, D.K. Walker, **M.J. Drummond**, E. Volpi, and B.B. Rasmussen. Reactive hyperemia is not responsible for the increases in muscle protein synthesis from blood flow restriction exercise. *Journal of Applied Physiology*, 112:1520-1528, 2012.

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72. **Drummond, M.J.**, C.S. Fry, E.L. Glynn, K.L. Timmerman, J.M. Dickinson, D.K. Walker, D.M. Gundermann, E. Volpi, and B.B. Rasmussen. Amino acid transporter expression is increased in the skeletal muscle of young and older humans following resistance exercise. *Journal of Applied Physiology*, 111: 135-142, 2011
73. Dickinson, J.M., C.S. Fry, **M.J. Drummond**, D.K. Walker, D.M. Gundermann, K.L. Timmerman, E. Volpi, B.B. Rasmussen. mTORC1 activation is necessary for the stimulation of human skeletal muscle protein synthesis following ingestion of essential amino acids. *Journal of Nutrition*, 141: 856-862, 2011
74. Fry, C.S., **M.J. Drummond**, E.L. Glynn, J.M. Dickinson, D.M. Gunderman, K.L. Timmerman, S. Dhanani, E. Volpi, and B.B. Rasmussen. Aging impairs contraction-induced human skeletal muscle mTORC1 signaling and protein synthesis. *Skeletal Muscle*. 1:11, 2011.
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95. Dreyer, H.C., **M.J. Drummond**, B. Pennings, S. Fujita, E.L. Glynn, D.L. Chinkes, S. Dhanani, E. Volpi, and B.B. Rasmussen. Leucine-enriched essential amino acid and carbohydrate ingestion following resistance exercise enhances mTOR signaling and protein synthesis in human muscle. *American Journal of Physiology Endocrinology and Metabolism*, 294:E392-400, 2008.
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Reviews/Perspectives/Editorials

105. **Drummond, M.J.** A practical dietary strategy to maximize the anabolic response to protein in aging muscle. *Journal of Gerontology: Medical Sciences*. 70: 55-56, 2015.
106. Thalacker-Mercer, A.E., **M.J. Drummond**. The importance of dietary protein for muscle health in inactive, hospitalized older adults. *Annals of the New York Academy of Sciences*. 1328: 1-9, 2014
107. **Drummond, M.J.**, R.L. Marcus, PC, LaStayo. Targeting anabolic impairment in response to resistance exercise in older adults with mobility impairments: Potential mechanisms and rehabilitation approaches, *Journal of Aging Research*. 2012: 486930, 2012.
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109. **Drummond, M.J.** Perspective: MicroRNAs and Exercise-Induced Skeletal Muscle Adaptations. *Journal of Physiology*, 588 (Pt. 20): 3849-3850, 2010.
110. **Drummond, M.J.**, H.C. Dreyer, C.S. Fry, E.L. Glynn, B.B. Rasmussen. Nutritional and contractile regulation of human skeletal muscle protein synthesis and mTORC1 signaling. *Journal of Applied Physiology*, 106: 1374-1384, 2009.
111. **Drummond, M.J.** and B.B. Rasmussen. Leucine-enriched nutrients and the regulation of mTOR signaling and human skeletal muscle protein synthesis. *Current Opinion in Clinical Nutrition and Metabolic Care*. 11: 222-226, 2008.

Book Chapters

Drummond, M.J. and B.B. Rasmussen. Muscle Aging- Ch. 6: Human muscle protein metabolism in relation to exercise and aging: potential therapeutic applications. In: *Muscle Ageing, Inclusion-Body Myositis and Myopathies*, Wiley-Blackwell, 2011.

Abstracts/Poster National Presentations (only 2021-2023 shown): total >150

Justin L. Shahtout, Hiroaki Eshima, Piyaat Siripoksup, Mackenzie J. Pearson, Ziad S. Mahmassani, Anthony R.P. Verkerke, Patrick J. Ferrara, Jordan M. Johnson, Sihem Boudina, Qitao Ran, Ethan J. Anderson, **Micah J. Drummond**, Katsuhiko Funai. Lipid hydroperoxides promotes skeletal muscle atrophy by accelerating autophagy-dependent lysosomal degradation. Cold Springs Harbor, 2021

Piyaat Siripoksup, Marisa J. Lang, Ziad S. Mahmassani, J. Alan Maschek, Anil K. Laxman, James E. Cox, **Micah J. Drummond**, Katsuhiko Funai. Mitochondrial phospholipids modulate skeletal muscle metabolic flexibility. Cold Springs Harbor, 2021

Elena M Yee, Patrick Ferrara, **Micah Drummond**. Intramuscular Macrophage delivery improves aged muscle function after disuse atrophy. University of Utah Center on Aging, May 2022.

Jonathan J. Petrocelli, Patrick J. Ferrara, Naomi M.M.P. de Hart, Elena M. Yee, **Micah J. Drummond**. Metformin and Leucine Combination Prevent C2C12 Serum-Deprivation Atrophy Corresponding to altered Protein Turnover Integrated Physiology on Exercise, Baltimore, MA Sept 2022.

Petrocelli, Jonathan., Lang, Marisa., Yee, Elena., de Hart, Naomi., Ferrara, Patrick., Fix, Dennis., Chaix, Amandine., Funai, Katsuhiko., **Drummond, Micah**. Cellular Senescence and Disrupted Proteostasis Induced by Myotube Atrophy are Prevented with Metformin and Leucine Combination Treatment. Advances in Skeletal Muscle Biology in Health and Disease, Gainesville, FL March, 2023

Petrocelli Jonathan, de Hart Naomi, Hauser Carson, Yee Elena, Bombyck Princess, Lane Thomas, Keirstead Hans, Nistor Gabrielle, Hafen Joelle, **Drummond Micah**. Intramuscular Treatment with a Stem Cell-Derived Secretome Product Increases Lean Mass, Ameliorates Fat Mass, and Improves Physical and Muscle Function in Old Mice. Advances in Skeletal Muscle Biology in Health and Disease, Gainesville, FL, March 2023.

Ou, I, Zimmerman G, Kubicki M, Thomas J, Tobin S, Miranda V, Depner C, **Drummond M**, Halliday T. Body Composition and Athletic Performance Changes in Adolescent Athletes in Response to Whey Protein Supplementation. Poster presentation at the Utah Academy of Nutrition and Dietetics Annual Meeting. Salt Lake City, UT, March 2023.

Grace A. Zimmerman, Isaac Z. Ou, Michelle Kubicki, Michael A. Maio, Jason V. Thomas, Selene Y. Tobin, Naomi de Hart, Jonathan J. Petrocelli, Victoria R. Miranda, Chris M. Depner, **Micah J. Drummond**, Tanya M. Halliday. The Effects of Whey Protein Supplementation on Body Composition and Performance in Adolescent Soccer Players. American College of Sports Medicine, Denver, CO, June 2023.

Jason V Thomas Chris M. Depner, **Micah J. Drummond**, Richard A. Winett, Brenda M. Davy, FACSM, Tanya M. Halliday. The Effects of AM vs PM Resistance Exercise on Cardiometabolic Outcomes in Adults with Prediabetes. American College of Sports Medicine, Denver, CO, June 2023.

V. PRESENTATIONS, INVITED LECTURES AND SYMPOSIA-FREE COMMUNICATIONS

Invited Visiting Professor Presentations

National

Drummond, M.J. Beyond glycemic control: Regulation of metformin on muscle cellular remodeling in aging, University of Alabama, Birmingham, Oct 2023.

Drummond, M.J. Macrophage Metabolism and Aging Muscle, University of Kentucky, Sept 2021

Drummond, M.J. Muscle Disuse in Older Adults: Mechanisms and Countermeasures, Muscle Health Research Centre, York University, Canada, Feb 2018

Drummond, M.J. Muscle adaptations to Physical Inactivity: Insights to the TLR4/MyD88 pathway, Molecular Life Sciences Seminar Series, Brigham Young University, March 2016

Drummond, M.J. Muscle adaptations to Physical Inactivity: Insights to the TLR4/MyD88 pathway, Nutrition and Physiology Seminar Series, University of Missouri, Feb 2016

Drummond, M.J. Muscle loss due to aging and inactivity: utilizing translational research to reduce disability. Department of Physical and Occupational Therapy. Invited speaker, Idaho State University, Feb, 2011.

Drummond, M.J. Anabolic impairment to essential amino acids in skeletal muscle of inactive older adults: role of amino acid transporters. Glanbia Nutritionals, Twin Falls, ID, Dec. 2011

Local

Drummond, M.J. Aging Muscle and Immunometabolism. Geriatric Research Education and Clinical Center, University of Utah, Jan 2022.

Drummond, M.J. Macrophage Metabolism and Muscle Aging. Diabetes and Metabolism Research Center Annual Symposium, University of Utah, Nov 2021.

Drummond, M.J. Macrophage Regulation of Muscle Aging. Seminars in Metabolism, University of Utah, Sept 2020

Drummond, M.J. Importance of Muscle Beyond Great Selfies: Muscle Aging, Disabilities and Prevention, Benefactor Symposium, University of Utah, Sept 2020

Drummond, M.J. Muscle and Metabolic Dysregulation in Physically Inactive Older Adults, Northwest American College of Sports Medicine, Oregon, Feb 2019

Drummond, M.J. Muscle and Metabolic Dysregulation in Physically Inactive Older Adults Seminars in Metabolism, University of Utah, May 2018

Drummond, M.J. Physical Inactivity, Skeletal Muscle and Metabolic Disease. Molecular Biology Program, University of Utah, August 2017

Drummond, M.J. Impact of exercise training on skeletal muscle inflammation in older adults recovering from hip fracture, Geriatric Research Update Conference, University of Utah, March 2017

Drummond, M.J. Physical Inactivity: Toll Road to Skeletal Muscle Inflammation and Lipotoxicity, Seminars in Metabolism, University of Utah, May 2016

Drummond, M.J. Dangers of Short-Term Bed Rest on Aging Skeletal Muscle: Mechanisms and Potential Solutions, Utah Vascular Research Lab Colloquium, Dec 2015

Drummond, M.J. Mouse Hindlimb Suspension, Comparative Medicine Center Lunch Symposium, Aug 2015

Drummond, M.J. Emerging Role of the TLR4/MyD88 pathway as a regulator of physical-inactivity induced metabolic disruption in skeletal muscle, Inflammation, Immunology and Infection Symposium, Park City, Utah, Aug 2015

Drummond, M.J. Physical inactivity-induced muscle dysfunction in older adults: Does autophagy play a role? Center on Aging Research Retreat, April 2015

Drummond, M.J. Muscle mass regulation in older adults with hip fracture: Role of amino acids and microvascular perfusion. Geriatric Division/GRECC Research Seminar, January, 2013.

Drummond, M.J. Age and Inactivity induced anabolic impairment in older adults: Clinical considerations and rehabilitation approaches. Metabolic Interest Group, University of Utah, September, 2012.

Drummond, M.J. Age and Inactivity induced anabolic impairment in older adults: Clinical considerations and rehabilitation approaches. Department of Physical Therapy, University of Utah, March, 2012.

Drummond, M.J. Exercise and Nutritional Interventions to Promote Muscle Rehabilitation. Department of Physical Therapy, University of Utah, Nov. 2010.

Drummond, M.J. MicroRNAs in Human Skeletal Muscle: Role of Aging and Exercise. Geriatric, Research, Education and Clinical Center, University of Utah, Aug. 2009.

Local (University of Texas Medical Branch)

Drummond, M.J. Bed rest impairs skeletal muscle mTORC1 signaling, amino acid transporter expression and protein synthesis in response to essential amino acid ingestion in older adults. Translational Research Scholars Program, UTMB, Sept. 2011.

Drummond, M.J. Aging and Amino Acid Transporters. Pepper Center Investigators Meeting, UTMB, April. 2011.

Drummond, M.J. MicroRNA Expression in Older Men. Translational Research Scholars Program, UTMB, May. 2010.

Drummond, M.J. Role of microRNAs in older human skeletal muscle. Pepper Center Investigators Meeting, UTMB, April. 2010.

Drummond, M.J. Role of microRNAs in older human skeletal muscle. Pepper Center Investigators Meeting, UTMB, Jan. 2009.

Drummond, M.J., C. S. Fry, E. L. Glynn, H. C. Dreyer, S. Dhanani, K. L. Timmerman, E. Volpi, and B. B. Rasmussen. Rapamycin prevents the post-exercise increase in protein synthesis and alters cell signaling in human skeletal muscle, Translational Research on Aging Meeting, March, 2008

Drummond, M.J., C.S. Fry, H.C. Dreyer, B. Pennings, S. Dhanani, E. Volpi, B.B. Rasmussen. Skeletal muscle anabolic signaling and gene expression in older and younger subjects following an acute bout of resistance exercise with essential amino acid ingestion, Pepper Center Investigators Meeting, UTMB, Oct. 2007.

Meeting Presentations

National

Drummond, M.J. Macrophage metabolism and immunomodulation in aging, Barshop Conference on Aging, Bandera, Texas, Oct 2023

Drummond, M.J. Old drugs, new tricks: Interaction of metformin with aging muscle and disuse, American College of Sports Medicine, Denver, CO, 2023

Drummond, M.J. & Reidy, P.T. Macrophage Regulation of Muscle Regrowth from Disuse in Aging. American College of Sports Medicine, Orlando, FL, 2019

Drummond, M.J. Bed Rest in Older Adults: Mechanisms and Countermeasures, American College of Sports Medicine, Minneapolis, MN, May 2018

Drummond, M.J. Aged Muscle Protein Metabolism Responses to Physical Inactivity and Rehabilitation. Architecture of Healthy Muscle: Interplay between Nutrition and Exercise. Experimental Biology, San Diego, CA 2016

Drummond, M.J. R. Marcus, C. Christianson. Unique Musculoskeletal Considerations in the Older Adult, American Physical Therapy Association, Washington D.C., June 2015

Drummond, M.J., R. Briggs, P. LaStayo, R. Marcus. Blunted Muscle Mass Response But Improved Muscle Quality After Bed Rest and Strength Training in Older Adults, Combined Sections Meeting, Las Vegas, NV, 2014

Drummond, M.J. C.S. Fry, E.L. Glynn, K.L. Timmerman, E. Volpi, and B.B. Rasmussen. Skeletal muscle amino acid transporter mRNA expression is increased in young and older humans following resistance exercise, American College of Sports Medicine, Baltimore, MD, 2010.

Drummond, M.J. C.S. Fry, E.L. Glynn, K.L. Timmerman, J.M. Dickinson, D. Walker, D.M. Gundersen, E. Volpi, and B.B. Rasmussen. Aging is associated with a dysregulated human skeletal muscle microRNA-499 and -208b expression following resistance exercise. Experimental Biology, Anaheim, CA, 2010.

Drummond, M.J., E.L. Glynn, C.S. Fry, K.L. Timmerman, E. Volpi, and B.B. Rasmussen. An increase in essential amino acid availability upregulates amino acid transporter expression in human skeletal muscle, Experimental Biology, Anaheim, CA, 2010.

Drummond, M.J., M. Miyazaki, C.S. Fry, H.C. Dreyer, B. Pennings, S. Dhanani, E. Volpi, K.A. Esser, B.B. Rasmussen. Expression of genes regulating protein synthesis in young and old human muscle following resistance exercise and essential amino acid ingestion. Experimental Biology, San Diego, 2008.

Drummond, M.J., P. R. Vehrs, D. Keller and G. Fellingham. Accuracy of five heart rate monitors during exercise. American College of Sports Medicine, St. Louis, MO. June, 2002

Local

Drummond, M.J. Regulation of amino acid transporters in skeletal muscle of older adults. Southwest American College of Sports Medicine, Newport Beach, CA, Oct. 2013

Drummond, M.J. Myogenic Regulator Factor Response to Resistance Exercise Volume in Skeletal Muscle. Regional American College of Sports Medicine, Las Vegas, NV. Nov, 2006.

Media/Press Release

2017 U of U Health press release on <https://pubmed.ncbi.nlm.nih.gov/28482746/>

“Method Bulks up Muscle during Bed Rest”

<https://uofuhealth.utah.edu/newsroom/news/2017/05/muscle-bed-rest>

2022 U of U Health press release on <https://pubmed.ncbi.nlm.nih.gov/36049060/>

“Donor immune cells accelerate recovery of muscle strength in older mice”

<https://healthcare.utah.edu/publicaffairs/news/2022/10/drummond-aging-muscle.php>

2022 Neo.life

“Sarcopenia: What a waste”

<https://neo.life/2022/12/sarcopenia-what-a-waste/>

2023 U of U Health press release on <https://pubmed.ncbi.nlm.nih.gov/37486024/>

“A common diabetes drug has a surprising side gig: muscle protector”

<https://healthcare.utah.edu/press-releases/2023/07/common-diabetes-drug-has-surprising-side-gig-muscle-protector>

2023 Other news releases on <https://pubmed.ncbi.nlm.nih.gov/37486024/>
<https://pubmed.ncbi.nlm.nih.gov/37486024/>

VI. GRANT WRITING AND RELATED ACTIVITIES

Active:

- 2022-2027 PI: O'Connell/Drummond (R01AG079477)
 NIH NIA
 Project Title: MicroRNA Regulation of Chronic Inflammation during Aging
- 2022-2027 PI: Drummond/O'Connell (R01AG076075)
 NIH NIA
 Project Title: Regulation of macrophage metabolism in aged muscle during recovery
- 2022-2024 PI: Christensen
 College of Health, University of Utah Seed Grant
 Title: Targeted Strength Training to Improve Physical Inactivity in Adults with Knee Osteoarthritis: Pilot Randomized Trial
 Role: Co-Investigator
- 2021-2026 MPI: Drummond/Funai (R01AG074535)
 NIH/NIA
 Project Title: LOOH-induced muscle atrophy with age
- 2019-2024 PI: Trinity (R01HL142603)
 NIH/NHLBI
 Project Title: Targeting Oxidative Stress to Prevent Vascular and Skeletal Muscle Dysfunction during Disuse
 Role: Co-Investigator
- 2022-2023 PI: Drummond
 Immunis
 Project Title: Mechanisms of stem-cell secretome on aging and muscle atrophy

Pending Grants:

- 2023-2028 PI: Drummond (R01AG086328)
 NIH/NIA
 Project Title: Leveraging senotherapeutic properties of metformin to improve collagen remodeling during muscle regrowth in older adults
- 2023-2028 PI: Halliday/Depner (R01DK138177)
 Project Title: Timing of Resistance Exercise on Cardiometabolic and Sleep Outcomes: The TRex Study.
 Role: Co-Investigator
- 2023-2028 PI: Swenson (R01)
 Project Title: Quantifying family risk and vaginal delivery on pelvic floor functional reserve: A novel approach to identifying precursor phenotypes of pelvic organ prolapse to advance prevention efforts
 Role: Co-Investigator
- 2024-2029 PI: Bodkin (K01)
 Project Title: Skeletal Muscle Remodeling and Intramuscular Adipose Tissue Following Traumatic Knee Injury
 Role: Primary Mentor

Past Grants (last 5-years):

- 2016-2023 PI: Drummond (R01AG050781)
 NIH/ NIA

	Project Title: Novel molecular mechanisms of skeletal muscle insulin resistance in physically inactive older adults
2021-2023	PI: Drummond (R56AG069328) NIH/NIA Project Title: Targeting macrophage metabolism to optimize muscle regrowth from disuse atrophy
2020-2023	PI: DeHart BUILD Dairy/Glanbia Project Title: Regulation of glycomacropeptide on skeletal muscle inflammation and mitochondrial function Role: Primary Mentor
2019-2023	PI: Drummond (R21AG064576) NIH/NIA Project Title: Use of insulin sensitizers to offset skeletal muscle dysfunction during immobility
2021-2023	PI: Petrocelli (F99AG073493) NIH / NIA Project Title: Elucidating the Mechanisms of Translational Approaches to Enhance Muscle Recovery in Aged Mice Role: Primary Mentor
2022-2024	PI: Ferrara (F32AG076167; Impact score 20) – Trainee declined award NIH/NIA Project Title: Investigating the role of CCL2 in aging skeletal muscle and muscle stem cells Role: Primary Mentor
2019-2022	PI: Drummond (1-19-ICTS-107) American Diabetes Association Project: Role of metformin on muscle and metabolic function in older adults during muscle disuse
2019-2022	PI: Drummond (R03AG064216) NIH/NIA Project Title: Amplifying muscle and metabolic recovery in aging using metformin and leucine
2019-2022	MPI: Drummond/O'Connell (R21AG062923) NIH/NIA Project Title: Role of Immune Cells on the Growth and Recovery of Aging Muscle
2019-2020	PI: Drummond Immunis Project Title: Skeletal muscle immunomodulation using STEM to prevent atrophy and enhance recovery following disuse in aged mice Role: PI
2019-2021	PI: Funai (R21AG063077) NIA/NIAMS Project Title: Mitochondrial phospholipids, ROS, and disuse atrophy Role: Co-Investigator
2019-2021	PI: Drummond/Howard (R21AR073422) NIH/NIAMS Project Title: Translational control of anabolic resistance in aging muscle Role: PI

2017-2021	PI: Summers (R01DK115824) NIH/NIDDK Project Title: The Role of Ceramides in Skeletal Muscle Role: Co-Investigator
2018-2021	PI: Petrocelli University of Utah Sports Medicine and Science Grant (Pre-doctoral fellowship) Project Title: Use of Metformin to Offset Impaired Muscle Recovery in Aged Mice Role: Primary Mentor
2018-2020	PI: DeHart BUILD Dairy/Glanbia Project Title: Muscle protein metabolism effects of acute dietary ingestion of cheese Role: Primary Mentor
2018-2020	PI: McKenzie (F31AG059438) NIH/NIA Project Title: Metformin to prevent inactivity-induced loss of muscle health during aging Role: Primary Mentor
2017-2018	PI: Drummond (Pilot grant) University of Utah Center on Aging Project Title: Role of metformin on muscle and metabolic function in older adults after bed rest Role: PI
2017-2019	PI: Reidy (F32AR072481) NIH/NIAMS Project Title: Macrophages to Enhance Recovery of Skeletal Muscle following Disuse Atrophy in Aging Role: Primary Mentor

VII. TEACHING, ADVISING AND OTHER ASSIGNMENTS

Graduate Courses (University of Utah):

Fall:

2012-2013	PHTH 7970 Doctoral Project – Chair and Committee member
2012- 2018	RHSCI 7010 Principles of Clinical Research I - Instructor
2012- 2016	RHSCI 7200 Neuromuscular Performance and Adaptation to Rehabilitation – Co-instructor / Instructor (2014)
2012-2020	NUTR 6440 Metabolism of Macronutrients - lecturer
2018-Pres	RHSCI 7000 Translational Rehabilitation Research – Instructor

Spring:

2012-2020	PHTH 7260 Management in Geriatrics – lecturer
2013-Pres	PHTH 7910 Doctoral Seminar - Instructor
2013	PHTH 7120 Therapeutic Exercise – lecturer

Curriculum Development:

2012-Pres Rehabilitation Sciences PhD program Physical Therapy and Athletic Training

Undergraduate Courses- Other Institutions:

2005	Exercise Science 363 (Exercise Physiology): Brigham Young University
2003	Exercise Science 205 (Fitness Training Techniques): Brigham Young University
2000	Sport Sciences 133 (Anatomical Kinesiology): University of the Pacific

Graduate Courses- Other Institutions:

2009, 2010 (Sum) PHYT 6316 (Exercise Physiology): University of Texas Medical Branch

Trainees: postdocs, undergraduates, medical/professional students/fellows, underrepresented groups

University of Utah-

2012-2013	Ruth Tanner (Undergraduate- Major: Biology)
2013 (May-Aug)	Lucille Brunner (Medical student – MSTAR award)
2013 (Feb-Aug)	Jakob Agergaard (International PhD student)
2013	Michael Ward (Undergraduate- Major: Exercise Science)
2013-2015	Lee Skinner (DPT student)
2013-2014	Brandon Vossion (Undergraduate- Major: Biology)
2013-2015	Emma Johnson (DPT student)
2013-2015	Oh Sung Kwon, PhD (Postdoctoral fellow- Faculty at University of Connecticut)
2014-2016	Preston Brunner (UROP - Major: Biology/Chemistry)
2016-2018	Jade Mulvey (UROP- Major: Exercise Science)
2016 (May-Aug)	Catherine Lindsay (Medical student – MSTAR award)
2016 (May-Aug)	James Gardner (Medical Student Research Program- NIDDK)
2016 (May-Aug)	Evan Bekes (Undergraduate; Native American Research Internship- NIDDK)
2016-2019	Paul Reidy, PhD (Postdoctoral Fellow- Faculty at Miami University)
2017 (May-Aug)	Kathrine Barrows (Medical Student Research Program- NIDDK)
2017 (May-Aug)	Aspen Johnson (Undergraduate; Native American Research Internship- NIDDK)
2017-2019	Nikol Yonemura (UROP- Major Kinesiology- Honors)
2017-2021	Ziad Mahmassani, PhD (T32 trainee -Present: Morphic Therapeutics)
2018 (May-Aug)	Jared Madsen (Medical Student Research Program- NIDDK)
2018 (May-Aug)	Vincent Morrow (Summer Program for Undergraduate Research (SPUR))
2018-2020	Jessie McGomery (UROP- Major: Chemistry- Honors)
2018-2020	Katie Kaput, DO (Endocrinology Medical Research Fellowship Program)
2019 (May-Aug)	Logan Edvalson (SPUR program)
2019-2021	Dennis Fix, PhD (Postdoctoral Fellow- Present: Recursion)
2019-2020	Tyler Drummond (UROP- Major: Kinesiology)
2020-2022	Patrick Ferrara (Postdoctoral Fellow- Present: Regeneron)
2020-2022	Serena Jones (UROP/Leap Program- Major: Biology)
2021 (May-Aug)	Chance McCutcheon (Medical Summer Research Program)
2021-2023	Elena Yee (RUUTE program; UROP; Research Assistant- Major: Chemistry)
2022-2023	Princess Bombyck (IM-PREP program; Research Assistant)
2022-Pres	Zachary Fennel (Postdoctoral Fellow)

Graduate Student Committees

University of Utah-

2011-2013	Sierra Smith, Rehabilitation Sciences- PhD Dissertation Chair
2011-2013	Dana Gershenoff, Division of Nutrition- Masters Thesis Committee Member
2012-2014	Matthew Carlin, Division of Nutrition- Masters Thesis Chair
2012-2015	Robert Briggs, Rehabilitation Sciences- PhD Dissertation Committee Member
2012-2017	Laura Young, Exercise and Sport Sciences- PhD Dissertation Committee Member
2013-2015	Ruth Tanner, Division of Nutrition- Masters Thesis Chair
2015-2017	Daniel Nelson, Exercise and Sport Science- PhD Dissertation Chair
2015-2020	Alec McKenzie, Rehabilitation Sciences- PhD Dissertation Chair (VA, SLC Postdoc)
2016-2021	Erin Larragoite, Pathology- PhD Preliminary Exam Committee
2017-2023	Morgan Nelson, Pathology- PhD Committee member
2017-2020	Anthony Verkerke, Nutrition and Integrative Physiology, PhD Committee Member
2017-2020	Patrick Ferrara, Nutrition and Integrative Physiology, PhD Committee Member
2018-2023	Jonathan Petrocelli, Rehabilitation Sciences- PhD Dissertation Chair
2019-2021	Joshua Kelley, Rehabilitation Sciences- PhD Dissertation Chair

2018-2023	Piyarat Siripoksup, Nutrition and Integrative Physiology, PhD Committee Member
2018-2022	Brandon Kowalski, University of Alaska, Masters Committee Member
2018-2020	Naomi DeHart, Nutrition and Integrative Physiology, Masters Thesis Chair
2019-2020	Taylor LaSalle, Nutrition and Integrative Physiology, PhD Committee Member
2020-2023	Carson Hauser, Nutrition and Integrative Physiology, Masters Committee Chair
2020-2023	Naomi DeHart, Nutrition and Integrative Physiology, PhD Dissertation Chair
2020-Pres	Sounghun Park, Nutrition and Integrative Physiology, PhD Committee Member
2020-Pres	Justin Shahtout, Rehabilitation Sciences- PhD Committee Member
2021-2022	Lisha Van Onselen, Rehabilitation Sciences- PhD Dissertation Chair
2022-Pres	Paul Bourrant, Nutrition and Integrative Physiology, PhD Dissertation Chair
2023-Pres	Robert Castro, Nutrition and Integrative Physiology, PhD Dissertation Chair
2023-Pres	Precious Oporum, Nutrition and Integrative Physiology, PhD Committee Member
2023-Pres	Elena Yee, Nutrition and Integrative Physiology, PhD Dissertation Chair
2023-Pres	Farahzaz Akramimoghaddam, Nutrition and Integrative Physiology, PhD Committee Member

VIII. REVIEWER EXPERIENCE

Reviewed ~10 manuscripts/year since 2007

Peer-reviewed Journals:

Journal of Applied Physiology; American Journal of Physiology, Endocrinology and Metabolism; American Journal of Physiology, Regulatory and Integrative; American Journal of Physiology, Cell; Journal of Physiology; Muscle and Nerve; FASEB Journal; Medicine and Science in Sport and Exercise; Scandinavian Journal of Medicine and Science in Sports; International Journal of Sports Nutrition and Exercise Metabolism; British Journal of Nutrition; American Aging Association (AGE)/GeroScience; European Journal of Applied Physiology; The International Journal of Applied and Basic Nutritional Sciences; Rejuvenation Research; Physiological Genomics; Journal of Nutrition; Nutrition Research; Clinical Nutrition; Experimental Gerontology; Nutrients; Ageing Research Reviews; Canadian Journal of Physiology and Pharmacology; PLoS ONE; Neuromuscular Disorders; Journal of Gerontology: Biological and Medical Sciences; Scientific Reports; Molecular Metabolism

Book Proposal Reviewer:

2014	Optimizing Dietary Protein for Human Health	Elsevier Publisher
2015	Enzymes in Nutrition	Elsevier Publisher

XI. GRANT REVIEW COMMITTEE

2021	NIH Aging Systems and Geriatrics (ASG) SEP ad hoc reviewer/Chair
2016-2022	NIH- Nutrition and Metabolism in Health and Disease (NMHD) Study Section Member
2016	Military Medical Research and Development (USARMAA)
2015	Mitacs Accelerate Proposal Application
2009, 2011	Biotechnology and biological sciences research council (BBSRC)

XII. SYMPOSIUM/MEETING CHAIR/COORDINATOR

2016	Energy and Macronutrient Metabolism: Protein Intake and Implication; American Society for Nutrition, San Diego CA
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XIII. AWARDS

2021	Margolis Foundation Research Award
2021	Star Reviewer, American Physiological Society, 2020
2019	Presidential Scholar, University of Utah
2016	Vernon R. Young International Award for Amino Acids, American Society for Nutrition
2015	Outstanding Junior Investigator of the Year, American Geriatrics Society
2014	New Investigator Award, College of Health, University of Utah
2009	Institute for Translational Sciences Faculty Development Award (KL2)
2008	School of Health Professions Researcher of the Year

2008	UTMB Researcher of the Month (May)
2008	Environmental and Exercise Physiology Section Gravitational Physiology Award for beginning investigators, Experimental Biology, San Diego
2005	Douglas Smith Memorial Endowment, Brigham Young University
2005	Mary Lou Fulton Fund, Brigham Young University
2004	Mary Lou Fulton Fund, Brigham Young University
2004	Norman James Research Scholarship, Southwest American College of Sports Medicine

XIV. SERVICE

University of Utah:

Department level-

2012-2017	Department Scholarship Committee
2012-Pres	DPT Student Admissions Committee
2018-Pres	Retention, Promotion, Tenure Committee
2022-Pres	RHSCI PhD Student Admission committee

College level-

2012-2017	College Council
2014-2015	College Scholarship and Awards
2016-Pres	College Research Committee (Chair since 2018)
2017-Pres	Data Safety Monitoring Board Member
2022-Pres	College Advisory Council

University level-

2014-2015	Center on Aging Steering Committee Member (ad hoc)
2016	Organizing Committee- University of Utah Diabetes and Metabolism Research Retreat
2016	Organizing Committee- University of Utah Diabetes and Metabolism Rising Stars Symposium
2016-Pres	Hatch Scholarship Committee – University of Utah Diabetes Obesity and Metabolism Center
2017-Pres	Center on Aging Steering Committee Member
2017-Pres	CTSI Internal Advisory Committee
2018-Pres	CTSI KL2 award committee member/reviewer
2018-2023	Immunology, Inflammation, Infectious Disease (3i) Scientific Advisory Board

Community-

2012-2015	H.R. Driggs elementary science fair judge
2012-2014	Senior Expo, South Towne Exposition Center, Sandy, Utah

Other-

2014	Southwest ACSM abstract and poster judge
2015	American Society of Nutrition abstract reviewer
2015-2018	Member at Large, Southwest American College of Sports Medicine
2018-Pres	NIH Data Safety Monitoring Board Member
2018-2023	Journal of Applied Physiology Editorial Board Member