James F. Markworth

Professor (Assistant)
Department of Animal Sciences
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EDUCATIONAL QUALIFICATIONS:

2013 Deakin University (Australia), PhD, Skeletal Muscle Physiology (PI Cameron-Smith)
2007 Deakin University (Australia), BSc (Hons), Exercise and Sports Science (Kinesiology)

PREVIOUS APPOINTMENTS:

2017-2020	University of Michigan Medical School (USA), Department of Molecular & Integrative Physiology – Postdoctoral Research Fellow (PI Brooks)
2013-2016	University of Auckland (New Zealand) – Research Fellow (PI Cameron-Smith)
2012-2013	University of Auckland (New Zealand) – Research Technician (PI Cameron-Smith)
2008-2012	Deakin University (Australia) – TA at undergraduate tertiary level (Exercise Physiology)

SIGNIFICANT DISTINCTIONS / AWARDS:

2024	College of Agriculture Award to Top 10 Assistant Professors with greatest increase in publication citations between 2022-2023, Purdue University
2023	Seed for Success Acorn Award to principal investigators and co-investigators who obtain their first research grants with external funding of $1 million or more for a single proposal, Purdue University
2017	Glenn Foundation for Medical Research Postdoctoral Fellowship in Aging Research
2011	Doctoral Student Travel award, School of Exercise and Nutrition Sciences, Deakin University
2010	PhD Program Oral Presentation Award. Molecular and Medical Research (MMR) Strategic Research Centre Symposium, Deakin University
2009	PhD Program Oral Presentation Award, School of Exercise and Nutrition Sciences 6th Annual Research Degree Symposium, Deakin University
2007	First class honours, School of Exercise and Nutrition Sciences, Deakin University

PROFESSIONAL SOCIETIES / SERVICE / OTHER ACTIVITIES:

Memberships/Affiliations

2022 - Current	Full member, Indiana Center for Musculoskeletal Health (ICMH), School of Medicine, Indiana University
2021 - Current	Faculty Associate, Center for Aging and the Life Course (CALC) – Purdue University
2021 - Current	Faculty Member, Interdisciplinary Nutrition Program (INP) – Purdue University
2021 - Current	Member, Purdue Institute of Inflammation, Immunology, and Infectious Disease (PI4D)
2016 - Current	Member, American Physiological Society (APS)
2017 - 2019	Member, The Gerontological Society of America
2004 - 2007	Member, Sports Medicine Australia

Reviewer for peer-reviewed journals:

I have served as a peer reviewer in the fields of physiology, immunology, cell biology, gerontology, nutrition, and exercise/sports sciences for journals including: *BMC geriatrics*, *Medicine and Science in Sport and Exercise*, *Mediators of Inflammation*, *Journal of Gerontology*, *Molecular Nutrition and Food Research*, *Acta Physiologica Hungarica*, *Cell Biology International*, *Journal of Applied Physiology*, *American Journal of Physiology: Endocrinology and Metabolism*, *Journal of Functional Foods*, *Cell Biology International, Life*

Sciences, *International Journal of Environmental Research and Public Health*, *Scientific Reports*, *Biomedicines*, *Frontiers in Nutrition*, *Frontiers in Pharmacology*, *Frontiers in Physiology*, *Frontiers in Cell and Developmental Biology*, *Aging Cell*, *Journal of Inflammation Research*, *Biology of Sport*, *Journal of Cachexia, Sarcopenia and Muscle, Experimental Cell Research,* and *the FASEB Journal*

Editor for peer-reviewed journals:

- Associate Editor for Frontiers in Physiology (Striated Muscle Physiology Speciality Section).
- Review Editor for Frontiers in Cell and Developmental Biology (Signalling Speciality Section)
- Review Editor for Frontiers in Network Physiology (Physiology of Exercise Speciality Section)
- Frontiers Topic Editor: Modulators of Skeletal Muscle Hypertrophy: Mechanisms to Lifestyle Strategies
- Guest Associate Editor for *Frontiers in Physiology* (Exercise Physiology Speciality Section) and *Frontiers in Sports and Active Living.*

TEACHING:

Undergraduate courses taught:

Department of Animal Sciences, Purdue University, West Lafayette, IN, USA (2023-Current):

ANSC 23000 – Physiology of Domestic Animals, Fall Instructor

School of Exercise and Nutrition Sciences, Deakin University, Melbourne, Australia (2008-2012):

HSE102 – *Functional Human Anatomy*: Tutor and laboratory demonstrator (TA)
HBS109 – *Human Structure and Function*: Tutor and laboratory demonstrator (TA)
HSE201 – *Exercise Physiology*: Tutor and laboratory demonstrator (TA)
HSE208 – *Integrated Human Physiology*: Tutor and laboratory demonstrator (TA)

Doctoral student supervision:

2022-Current	Major Professor to Xinyue Lu, PhD, Purdue University	Ongoing
2022-Current	Major Professor to Hamood Rehman, PhD, Purdue University	Ongoing
2022-Current	Major Professor to Binayok Sharma, PhD. Purdue University	Ongoing
2015-2016	Advisor to Brenan Durainayagam, PhD, University of Auckland	Completed
2014-2016	Co-supervisor to Nina Zeng, PhD, University of Auckland	Completed
2014-2016	Advisor to Randall D'Souza, PhD, University of Auckland	Completed
2014-2016	Advisor to Shikha Pundir, PhD, University of Auckland	Completed
2013-2016	Advisor to Chantal Pileggi, PhD, University of Auckland	Completed
2013-2016	Co-supervisor to Vandre Figueiredo, PhD, University of Auckland	Completed
2013-2016	Co-supervisor to Amber Milan, PhD, University of Auckland	Completed

Masters/Honours student supervision:

2014-2015	Co-supervisor to Brenan Durainayagam, Masters, Uni of Auckland	Completed
2013-2014	Co-supervisor to Nina Zeng, Honours, University of Auckland	Completed
2013-2014	Advisor to Shikha Pundir, Masters, University of Auckland	Completed

Undergraduate student supervision:

2021-2022	Major Professor to Jieun (Grace) Lee, Purdue University	Completed
2018-2019	Supervisor to Eunice Lim, University of Michigan	Completed
2018-2019	Supervisor to Brennan Rourke, University of Michigan	Completed

Visiting student supervision:

2014	Co-supervisor to Llion Roberts, PhD, 1 month laboratory visit	Completed

RESEARCH SPECIALTIES / CAREER:

My doctoral thesis utilized both human translational and cell-based models to investigate the molecular mechanisms by which eicosanoid metabolites of omega-6 arachidonic acid known as prostaglandins can regulate skeletal muscle anabolism. This work contributed to our current understanding that metabolites of dietary essential fatty acids, as found in animal products such as meat, poultry, and eggs, play an important supportive role in skeletal muscle growth. Of clinical relevance were translational studies undertaken by my colleagues, students and I at the University of Auckland, New Zealand, in collaboration with both AgResearch and Fonterra industry partners, which characterised the effects of dairy derived nutritional interventions on human muscle physiology and human metabolic health. In my subsequent post-doctoral training in the USA undertaken at the University of Michigan, I utilized small animal models of muscle damage and inflammation, including both functional overload (e.g., synergist ablation) and acute degenerative injury (e.g., cardiotoxin/barium chloride injection), to investigate the molecular and cellular mechanisms underlying adaptive skeletal muscle growth and regeneration. My most recent lead author publications focused the potential role of novel bioactive metabolites of omega-3 fatty acids known as specialised pro-resolving mediators in controlling inflammation, its active resolution, and tissue regeneration following musculoskeletal tissue damage. I also received extramural funding from the Glenn Foundation for Medical Research to investigate the role of these novel inflammation-resolving pathways in age-associated muscle wasting, anabolic resistance, and loss of muscle regenerative capacity (sarcopenia). In my position as Assistant Professor in the Department of Animal Science at Purdue University my laboratory is investigating the role of endogenous lipid mediator biosynthetic pathways in controlling postnatal skeletal muscle growth and development, as well as the applicability of changes in dietary essential fatty acid intake and their various bioactive metabolites as novel strategies to promote skeletal muscle adaptations (e.g. post-natal development, regeneration, and hypertrophy) and also to ameliorate skeletal muscle wasting under conditions of chronic inflammatory stress (e.g. aging, cachexia, and muscular dystrophy).

RESEARCH PUBLICATIONS:

Peer refereed papers (12 first author, 5 senior author and 47 co-author: Citations=3048, h-index=31)

1. Castor-Macias JA, Larouche JA, Wallace EC, Spence BD, Eames A, Duran P, Yang BA, Fraczek PM, Davis CA, Brooks SV, Maddipati KR, Markworth JF, Aguilar CA. Maresin 1 repletion improves muscle regeneration after volumetric muscle loss. *Elife*. 2023 Dec 22:12:e86437. doi: 10.7554/eLife.86437. Online ahead of print.
2. D'Souza E, Figueiredo V, **Markworth JF**, Zeng N, Hedges C, Roberts L, Raastad T, Coombes J Peake J, Mitchell C, Cameron-Smith D. Cold water immersion in recovery following a single bout resistance exercise suppresses mechanisms of miRNA nuclear export and maturation. *Physiological Reports*. 2023. Aug;11(15):e15784. doi: 10.14814/phy2.15784.
3. Figueiredo VC, Roberts LA, Cameron-Smith D, **Markworth JF**. Editorial: Modulators of skeletal muscle hypertrophy: Mechanisms to Lifestyle Strategies. *Frontiers in Physiology*. 2022 Apr 26;13:893698.
4. Guzman SD, Judge J, Shigdar S, Paul TA, Davis CS, Macpherson PC, **Markworth JF**, Van Remmen H, Richardson A, McArdle A, Brooks SV. Removal of p16INK4 expressing cells in late life has moderate beneficial effects on skeletal muscle function in male mice. *Frontiers in Aging.* 2022 Jan 26;2:821904.
5. Bjørnsen T, Wernbom M, Paulsen G, **Markworth JF**, Berntsen S, D'Souza RF, Cameron-Smith D, Raastad T. High-frequency blood flow restricted resistance exercise results in acute and prolonged cellular stress more pronounced in type I than in type II fibers. *Journal of Applied Physiology*. 2021 Aug 1;131(2):643-660.
6. Larouche J, Mohiuddin M, Choi JJ, Ulintz PJ, Fraczek PM, Sabin K, Pitchiaya S, Kurpiers SJ, Castor-Macias J, Liu W, Hastings RL, Brown LA, **Markworth JF**, De Silva K, Levi BD, Merajver SD, Valdez G, Chakkalakal JV, Jang Y, Brooks SV, Aguilar CA. Murine muscle stem cell response to

perturbations of the neuromuscular junction are attenuated with aging. *Elife*. 2021 Jul 29;10:e66749.

7. **Markworth JF**, Brown LA, Lim E, Castor-Macias JA, Larouche J, Macpherson PCD, Davis C, Aguilar CA, Maddipati KR, Brooks SV. Metabolipidomic profiling reveals an age-related deficiency of skeletal muscle pro-resolving mediators that contributes to maladaptive tissue remodeling. *Aging Cell.* 2021 Jun;20(6):e13393.
8. **Markworth JF**, Sugg KB, Sarver DC, Maddipati KR, Brooks SV. Local shifts in inflammatory and resolving lipid mediators in response to tendon overuse. The FASEB Journal. 2021 Jun;35(6):e21655.
9. Zeng N, D'Souza RF, Macrae C, Figueiredo VC, Pileggi CA, **Markworth JF**, Merry TL, Cameron-Smith D, Mitchell CJ. Daily protein supplementation attenuates immobilisation-induced blunting of postabsorptive muscle mTORC1 activation in middle age men. *American Journal of Physiology: Cell Physiology*. 2021 Apr 1;320(4):C591-C601.
10. Figueiredo V, Van Pelt D, D'Souza R, Zeng N, **Markworth JF**, Poppitt S, Lawrence M, Miller B, Peterson C, McCarthy J, Dupont-Versteegden E, Mitchell CJ, and Cameron-Smith D. Ribosome biogenesis and degradation regulate translational capacity during muscle disuse and reloading. *Journal of Cachexia, Sarcopenia and Muscle.* 2021 Feb;12(1):130-143.
11. Ramme AJ, Darcy R, Rourke BJ, Davis C, **Markworth JF**, Junginger L, Maerz T, Brooks SV, Bedi A. Local and Systemic Effects of Blood Flow Restriction Therapy in an Animal Model. *The American Journal of Sports Medicin*e. 2020 Nov;48(13):3245-3254.
12. **Markworth JF**, Brown LA, Lim E, Floyd C, Larouche J, Castor-Macias JA, Sugg KB, Sarver DC, Macpherson PC, Davis C, Aguilar CA, Maddipati KR, Brooks SV. Resolvin D1 supports skeletal myofiber regeneration via actions on myeloid and muscle stem cells. *JCI Insight*. 2020 Sep 17;5(18):e137713.
13. Shcherbina A, Larouche J, Fraczek P, Yang BA, Brown LA, **Markworth JF**, Chung CH, Khaliq M, de Silva L, Choi JJ, Fallahi-Sichani M, Chandrasekaran S, Jang YC, Brooks SV, Aguilar CA. Dissecting muscle stem cell aging through integrative genomic analysis. *Cell Reports*. 2020 Jul 28;32(4):107964.
14. Peake JM, **Markworth JF**, Cumming KT, Aas SN, Roberts LA, Raastad T, Cameron-Smith D, Figueiredo VC. The Effects of Cold Water Immersion and Active Recovery on Molecular Factors That Regulate Growth and Remodeling of Skeletal Muscle After Resistance Exercise. *Frontiers in Physiology*. 2020 Jun 30;11:737.
15. Walker S, Häkkinen K, Newton RU**, Markworth JF**, Pundir S, Haff GG, Cameron-Smith D, Blazevich AJ. Acute responses of comprehensive gonadosteroids and corticosteroids to resistance exercise before and after 10 weeks of supervised strength training. *Experimental Physiology*. 2020 Mar;105(3):438-448.
16. Ramzan F, D'Souza RF, Durainayagam BR, Milan AM, **Markworth JF**, Soberanis VM, Sequeira IR, Roy NC, Poppitt SD, Mitchell CJ, Cameron Smith D. Circulatory miRNA biomarkers of metabolic syndrome. *Acta Diabetologica*. 2020 Feb;57(2):203-214.
17. Prodhan UK, Pundir S, Chiang VSC, Milan AM, Barnett MPG, Smith GC, **Markworth JF**, Knowles SO, Cameron-Smith D. Comparable Postprandial Amino Acid and Gastrointestinal Hormone Responses to Beef Steak Cooked Using Different Methods: A Randomised Crossover Trial. *Nutrients.* 2020 Jan 31;12(2):380.
18. Sharma P, Gillies N. Pundir S, Pileggi CA, **Markworth JF**, Thorstensen EB, Cameron-Smith D, Milan AM. Comparison of the acute postprandial circulating B-vitamin and vitamer responses to single breakfast meals in young and older individuals: Preliminary secondary outcomes of a randomized controlled trial. *Nutrients*. 2019 Nov 28;11(12). pii: E2893.
19. Figueiredo VC, Farnfield MM, Ross MLR, Gran P, Halson SL, Peake JM, Cameron-Smith, **Markworth JF**. The effect of carbohydrate ingestion following eccentric resistance exercise on Akt/mTOR and ERK pathways: a randomized double-blinded crossover study. *International Journal of Sport Nutrition and Exercise Metabolism*. 2019 Oct 17, 29, 664-670.
20. Vella L, **Markworth JF**, Farnfield MM, Maddipati KR, Russell AP, Cameron-Smith D. Intramuscular inflammatory and resolving lipid profile responses to an acute bout of resistance exercise in men. *Physiological Reports*. 2019 Aug;7(13):e14108.
21. D'Souza RF, Zeng N, **Markworth JF**, Figueiredo VC, Hedges CP, Petersen A, Della Gatta PA, Cameron-Smith D, Mitchell CJ. Whey protein supplementation alters the intramuscular miRNA response to resistance exercise in elderly men. *Frontiers in Nutrition*. 2019 Jun 12;6:91.

22. Barnett MPG, Chiang VSC; Milan AM, Pundir S; Walmsley TA, Grant S; **Markworth JF**, Quek SW, George PM, Cameron-Smith D. Plasma elemental responses to red meat ingestion in healthy young males and the effect of cooking method. *European Journal of Nutrition*. 2019 Apr;58(3):1047-1054.
23. Pileggi CA, Hedges CP, D'Souza RF, Durainayagam BR, **Markworth JF**, Hickey AJ, Mitchell CJ, Cameron-Smith D. Increased skeletal muscle H2O2 and mitochondrial respiratory capacity with exercise recovery from two-week limb immobilization. *Free Radical Biology and Medicine*. 2018 Aug 20;124:241-248.
24. **Markworth JF**, D'souza RF, Aasen KMM, Mitchell SM, Durainayagam BR, Sinclair AJ, Egner IM, Raastad T, Cameron-Smith D, Mitchell CJ. Dietary arachidonic acid supplementation augments the acute inflammatory response to resistance exercise in trained men. *Journal of Applied Physiology.* 2018 Aug 1;125(2):271-286.
25. D'Souza RF, Zeng N, **Markworth JF**, Figueiredo V, Roberts L, Raastad T, Coombes J, Peake J, Cameron-Smith D, Mitchell C. Divergent effects of cold water immersion versus active recovery on skeletal muscle fiber type and angiogenesis in young men. *American Journal of Physiology - Regulatory, Integrative and Comparative.* 2018 Jun 1;314(6):R824-R833.
26. Figueredo VC, **Markworth JF,** Zeng N, Della Gatta PA, Petersen A, Barnett MPG, Cameron-Smith D. High dose of whey protein after resistance exercise promotes 45 S preribosomal RNA synthesis in older men. 2018 *Nutrition*. Jun;50:105-107.
27. Sugg KB, **Markworth JF**, Disser NP, Rizzi AM, Talarek JR, Sarver DC, Brooks SV Mendias CL**.** Postnatal tendon growth and remodelling requires platelet-derived growth factor receptor signalling. *American Journal of Physiology: Cell Physiology*. 2018 Apr 1;314(4):C389-C403.
28. Mitchell CJ, D'Souza RF, Figueiredo VC, Chan A, Aasen K, Durainayagam B, Mitchell S, Sinclair AJ, Egner IM, Raastad T, Cameron-Smith D, **Markworth JF**. The effect of dietary arachidonic acid supplementation on acute muscle adaptive responses to resistance exercise in trained men: a randomized controlled trial. *Journal of Applied Physiology*. 2018 Apr 1;124(4):1080-1091.
29. D'Souza RF, Zeng N, Figueiredo VC, **Markworth JF**, Durainayagam BR, Mitchell SM Fanning A, Poppitt SD, Cameron-Smith D, Mitchell CJ. Dairy protein supplementation modulates the human skeletal muscle microRNA response to lower limb immobilisation*. Molecular Nutrition and Food Research*. 2018 Apr;62(7):e1701028
30. **Markworth JF**, Mitchell CJ, D'Souza RF, Aasen KMM, Durainayagam BR, Mitchell SM, Chan AHC, Sinclair AJ, Garg M, Cameron-Smith D. Arachidonic acid supplementation modulates skeletal muscle lipid profile with no effect on basal inflammation in resistance exercise trained men. *Prostaglandins, Leukotrienes and Essential Fatty Acids*. 2018 Jan;128:74-86*.*
31. Zeng N, D'Souza RF, Figueiredo VC, **Markworth JF**, Roberts LA, Peake JM, Mitchell CJ, Cameron-Smith D. Acute resistance exercise induces Sestrin2 phosphorylation and p62 dephosphorylation in human skeletal muscle. *Physiol Rep*. 2017 Dec;5(24). pii: e13526.
32. D'Souza RF, **Markworth JF**, Aasen KMM, Zeng N, Cameron-Smith D, Mitchell CJ. Acute resistance exercise modulates microRNA expression profiles: Combined tissue and circulatory targeted analyses. 2017 *PLoS ONE*. Jul 27;12(7):e0181594.
33. Figueiredo VC, **Markworth JF**, Cameron-Smith, D. Considerations on mTOR regulation at Serine 2448: implications for muscle metabolism studies. *Cellular and Molecular Life Sciences*. 2017 Jul;74(14):2537-2545.
34. Doynova MD, **Markworth JF**, Cameron-Smith D, Vickers MH, O'Sullivan JM. Linkages between 3D organization changes and transcription during myotube differentiation in vitro. *Skeletal Muscle*. 2017 Apr 5;7(1):5.
35. Milan AM, Pundir S, Pileggi CA, **Markworth JF**, Lewandowski PA Cameron-Smith D. Comparisons of the postprandial inflammatory and endotoxaemic responses to mixed meals in young and older individuals: A Randomised Trial. *Nutrients*. 2017 Apr 2;9(4).
36. Sugg K, Korn MA, Sarver DC, **Markworth JF**, Mendias CL. Inhibition of platelet-derived growth factor signaling prevents muscle fiber growth during skeletal muscle hypertrophy. *FEBS letters*. 2017 Mar;591(5):801-809.
37. Peake JM, Roberts LA, Figueiredo VC, Egner I, Christensen SK, Nyvik S, Suzuki K, **Markworth JF**, Coombes JS, Cameron-Smith D, Raastad . The effects of cold water immersion on inflammation, neurotrophins and heat shock proteins in skeletal muscle after resistance exercise. *Journal of Physiology*. 2017 Feb 1;595(3):695-711.
38. **Markworth JF**, Durainayagam B, Figueiredo V, Liu K, Guan J, MacGibbon A, Fong B, Rowan A, McJarrow P, and Cameron-Smith D. Dietary supplementation with bovine derived milk fat globule membrane lipids promotes neuromuscular development in growing rats. *Nutrition and Metabolism*. 2017 Jan 23;14:9.

39. Pileggi CA, Hedges CP, Segovia SA, **Markworth JF**, Durainayagam BR, Gray C, Zhang XD, Barnett MPG, Vickers MH, Hickey AJ, Reynolds CM, Cameron-Smith D. Maternal high fat diet alters skeletal muscle mitochondrial catalytic activity in adult male rat offspring. *Frontiers in Physiology*. 2016 Nov 18;7:546.
40. **Markworth JF**, Kaur G, Miller E, Sinclair AJ, Maddipati KR, Cameron-Smith D. Divergent shifts in lipid mediator profile following supplementation with n-3 docosapentaenoic acid and eicosapentaenoic acid. *The FASEB Journal.* 2016 Nov;30(11):3714-3725.
41. Vella LD, **Markworth JF**, Raastad T, Peake J, Snow RJ, Cameron-Smith D, Russell AP. Ibuprofen ingestion does not affect markers of post-exercise inflammation in human muscle. *Frontiers in Physiology.* 2016 Mar 29;7:86.
42. Milan, A, Nuora A, Pundir S, Pileggi C, **Markworth JF**, Linderborg K, Cameron-Smith D. Older adults have an altered chylomicron response to a high fat meal. *British Journal of Nutrition.* 2016 Mar;115(5):791-9.
43. Pileggi C, Segovia S, **Markworth JF**, Gray C, Zhang X, Milan A, Mitchell C, Barnett M, Roy N, Vickers M, Reynolds C, and Cameron-Smith D. Maternal Conjugated linoleic acid supplementation reverses high-fat diet induced skeletal muscle atrophy and inflammation in adult rat offspring. *American Journal of Physiology - Regulatory, Integrative and Comparative Physiology.* 2016 Mar 1;310(5):R432-9.
44. Figueiredo VC, **Markworth JF**, Durainayagam BR, Pileggi CA, Roy NC, Barnett MPG, Cameron-Smith D. Impaired ribosome biogenesis and skeletal muscle growth in a murine model of inflammatory bowel disease. *Inflammatory Bowel Diseases.* 2016 Feb;22(2):268-78.
45. Figueiredo VC, Roberts LA, **Markworth JF**, Barnett MPG, Coombes JS, Raastad T, Peake JM and Cameron-Smith D. Impact of resistance exercise on ribosome biogenesis is acutely regulated by post-exercise recovery strategies. *Physiological Reports.* 2016 Feb;4(2). pii: e12670.
46. **Markworth JF**, Maddipati KR and Cameron-Smith D. Emerging roles of pro-resolving lipid mediators in immunological and adaptive responses to exercise-induced muscle injury. *Exercise Immunology Reviews*. 2016 22:110-34.
47. Figueiredo VC and **Markworth JF**. Mechanisms of protein synthesis activation following exercise: new pieces to the increasingly complex puzzle. *The Journal of Physiology*. 2015 593(21):4695-5.
48. Mitchell CJ, McGregor RA, D'Souza RF, Thorstensen EB, **Markworth JF**, Fanning, Poppitt SD, Cameron-Smith D. Consumption of Milk Protein or Whey Protein Results in a Similar Increase in Muscle Protein Synthesis in Middle Aged Men. *Nutrients*. 2015 Oct 21;7(10):8685-99.
49. Nuora A, Shao-Chih Chiang V, Milan A, Tarvainen A, Pundir S, Quek SY, Smith GC, **Markworth JF**, Ahotupa M, Cameron-Smith D, Linderborg KM. The impact of beef steak thermal processing on lipid oxidation and postprandial inflammation related responses. *Food Chemistry*. 2015 Oct 1;184:57-64.
50. Milan AM, D'souza RF, Pundir S, Pileggi CA, Barnett MPG, **Markworth JF**, Cameron-Smith D, Mitchell CJ. Older adults have delayed amino acid absorption after a high protein mixed breakfast meal. *The Journal of Nutrition, Health and Aging*. 2015;19(8):839-45.
51. Roberts LA, Raastad T, **Markworth JF**, Figueiredo VC, Egner IM, Shield A, Cameron-Smith D, Coombes J, and Peake. Post-exercise cold water immersion attenuates acute anabolic signalling and long-term adaptations in muscle to strength training. *Journal of Physiology.* 2015 Sep;593(18):4285-301.
52. Ihsan M, **Markworth JF**, Watson G, Choo H, Govus A, Pham T, Hickey A, Cameron-Smith D, and Abbiss C. Regular Post-Exercise Cooling Enhances Mitochondrial Biogenesis through AMPK and p38 MAPK in Human Skeletal Muscle. *American Journal of Physiology - Regulatory, Integrative and Comparative Physiology*. 2015 Aug 1;309(3):R286-94.
53. Peake J, **Markworth JF**, Nosaka K, Raastad T, Wadley G, and Coffey V. Modulating exercise-induced hormesis: does less equal more? *Journal of Applied Physiology.* 2015 Aug 1;119(3):172-89.
54. Figueiredo V, Caldow M, Massie V, **Markworth JF**, Cameron-Smith D, and Blazevich A. Ribosome biogenesis adaptation in resistance training-induced human skeletal muscle hypertrophy. *American Journal of Physiology: Endocrinology and Metabolism.* 2015 Jul 1;309(1):E72-83.
55. Vincent G, Lamon S, Gant N, Vincent PJ, MacDonald JR, **Markworth JF**, Edge JA, and Hickey AJR. Changes in mitochondrial function and mitochondria associated protein expression in response to 2-weeks of high intensity interval training. *Frontiers in Physiology*. 2015 Feb 24;6:51.
56. Mitchell CJ, Della Gatta PA, Petersen AC, Cameron-Smith D, **Markworth JF**. Soy protein ingestion results in less prolonged p70S6 kinase phosphorylation compared to whey protein after resistance exercise in older men. *Journal of the International Society of Sports Nutrition.* 2015 Feb 5;12:6.

57. D'Souza RF, **Markworth JF**, Figueiredo VC, Della Gatta PA, Petersen AC, Mitchell CJ, Cameron-Smith D. Dose-dependent increases in p70S6K phosphorylation and intramuscular branched chain amino acids in older men following resistance exercise and protein intake. *Physiological Reports.* 2014 Aug 7;2(8).
58. Vella LD, **Markworth JF**, Peake J, Snow R, Cameron-Smith D, and Russell A. Ibuprofen supplementation and its effects on NF-kB activation in skeletal muscle following resistance exercise. *Physiological Reports*. 2014 Oct 24;2(10).
59. Peake J, Tan SJ, **Markworth J**, Broadbent J, Skinner T, and Cameron-Smith D. Metabolic and hormonal responses to isoenergetic high-intensity interval exercise and continuous moderate-intensity exercise. *American Journal of Physiology: Endocrinology and Metabolism.* 2014 Oct 1:307(7).
60. Serpiello FR, McKenna MJ, Coratella G, **Markworth JF**, Tarperi C, Bishop D, Stepto NK, Cameron-Smith D, Schena F. Futsal and Continuous Exercise Induce Similar Changes in Specific Skeletal Muscle-Signalling Proteins. *International Journal of Sports Medicine.* 2014 Sep;35(10):863-70.
61. **Markworth JF,** Vella LD, Figueiredo VC, Cameron-Smith, D. Ibuprofen treatment blunts early translational signalling responses in human skeletal muscle following resistance exercise. *Journal of Applied Physiology.* 2014 Jul 1;117(1):20-8.
62. **Markworth JF,** Vella LD, Lingard BS, Tull DL, Rupasinghe TW, Sinclair AJ, Maddipati KR, and Cameron-Smith D. Human inflammatory and resolving lipid mediator responses to resistance exercise and ibuprofen treatment. *American Journal of Physiology: Regulatory, Integrative And Comparative Physiology*. 2013 Dec;305(11):R1281-96.
63. **Markworth JF**, Cameron-Smith D. Arachidonic acid supplementation enhances in vitro skeletal muscle cell growth via a COX-2-dependent pathway. *American Journal of Physiology: Cell Physiology*. 2013 Jan 1;304(1):C56-67.
64. **Markworth JF**, Cameron-Smith D. Prostaglandin F2 alpha stimulates PI3K/ERK/mTOR signalling and skeletal myotube hypertrophy. *American Journal of Physiology: Cell Physiology.* 2011 Mar;300(3):C671-82.

Conference proceedings (12 presenting author, 18 co-author):

1. **Markworth JF**, Sharma B, Rehman H, Lu X. Indiana Station Report. Multistate Project (NC1184): Molecular Mechanisms Regulating Skeletal Muscle Growth and Differentiation. Annual Meeting. 2022 September 29-30. Department of Animal & Dairy Sciences, University of Wisconsin-Madison. Madison, Wisconsin, USA.
2. **Markworth JF**, Brown LA, Lim E, Castor-Macias JA, Larouche J, Macpherson PCD, Davis C, Aguilar CA, Maddipati KR, Brooks SV. Local imbalance of inflammatory and resolving lipid mediators limits the regenerative capacity of aging skeletal muscle. 3rd International Conference on Musculoskeletal and Neural Interactions. 2022 August 25-26. Emory University. Atlanta, Georgia, USA.
3. **Markworth JF**, Brown LA, Lim E, Castor-Macias JA, Larouche J, Macpherson PCD, Davis C, Aguilar CA, Maddipati KR, Brooks SV. Metabolipidomic Profiling Reveals an Age-Related Deficiency of Skeletal Muscle Proresolving Mediators that Contributes to Maladaptive Tissue Remodeling. iSLS 9 – 9th International Singapore Lipid Symposium. 2021 March 1–5. Singapore.
4. **Markworth JF**, Brown LA, Davis CS, Lim E, Macpherson PCD, Maddipati KR, Brooks SV. Effect of resolvin D1 on skeletal muscle inflammation and regeneration following barium chloride induced injury in aged mice. *The Paul F. Glenn/AFAR Conference on the Biology of Aging/The 32nd Annual AFAR Grantee Conference*. 2019 June 3-5. Santa Barbara, California, USA.
5. Brown LA., **Markworth JF**, Rourke BJ. Qasawa AH., Lim E., Brooks SV. Skeletal muscle morphology and inflammation is altered in sarcopenic mice throughout muscle regeneration. *48th Annual Meeting of the American Aging Association*. 2019 May 29-June 2. Burlingame, California, USA.
6. Brown LA, **Markworth JF**, Rourke BJ, Qasawa AH., Lim E., Brooks SV. Skeletal muscle inflammation is altered in sarcopenic mice during muscle regeneration. *Geriatrics Centre Research Symposium*. University of Michigan, 2019 May 9. Ann Arbor, Michigan, USA.
7. Brown LA, **Markworth, JF**, Rourke, BJ, Qasawa, AH, Lim, E, Brooks, SV. Skeletal muscle inflammation is altered in sarcopenic mice during muscle regeneration*. 3rd Annual Musculoskeletal Symposium*. 2019 Apr 29. Ann Arbor, Michigan, USA.

8. Brown, LA, **Markworth, JF**, Qasawa, AH, Lim, E; Brooks, SV. Skeletal muscle inflammation is altered in sarcopenic mice during muscle regeneration. *Advances in Skeletal Muscle Biology in Health and Disease Conference*. 2019 March 6-8. Gainesville, Florida, USA.
9. Ramzan F, D'Souza RF, Durainayagam BR, Milan AM, **Markworth JF**, Roy NC, Mitchell CJ, Cameron-Smith D. Metabolic disease risk alters the circulating peripheral blood mononuclear cell microRNA in response to a high glycemic meal. *2018 Annual Meeting of the Nutrition Society of New Zealand*. 2018 November 28-30. Auckland, New Zealand.
10. **Markworth JF**, Peake J, Roberts L, Figueiredo V, Egner I, Krog S, Aas S, Suzuki K, Coombes J, Cameron-Smith D, Raastad T. A comparison of cold water immersion and active recovery on inflammation and cell stress responses in human skeletal muscle after resistance exercise. *American physiological society* (*APS): The Integrative Biology of Exercise VII*. 2016 November 2—4. Phoenix, Arizona, USA.
11. **Markworth JF**, Barnett MPG, Figueiredo VC, Roy NC, Maddipati KR, Cameron-Smith D. Omega-3 PUFA therapy increases specialized pro-resolving mediators in a murine model of chronic skeletal muscle inflammation. *Miami 2016 Winter Symposia: Inflammation*. January 24—27, 2016 Miami, USA.
12. Milan AM, Pundir S, Pileggi CA, **Markworth JF**, Roy NC, Cameron-Smith D. The impact of age on the inflammatory, endotoxaemic, and oxidative stress responses to a high fat meal. *Joint Annual Scientific Meeting of the Nutrition Society of New Zealand and the Nutrition Society of Australia*, Wellington, New Zealand. December 1-4 (2015).
13. Milan AM. Nuora A, Pundir S, Pileggi CA, **Markworth JF**, Linderborg K, Cameron-Smith D. Postprandial fatty acid appearance is altered in older adults after high or low fat mixed meals. *3rd International Food Structures, Digestion and Health Conference*. Wellington, New Zealand. October 28-30 (2015).
14. Figueiredo VC, Roberts LA, **Markworth JF**, Peake JM, and Cameron-Smith D. The effect of resistance exercise on muscle ribosome biogenesis is blunted by cold water immersion. *Cell Symposia: Exercise Metabolism*. Amsterdam, The Netherlands. July 12-14, (2015).
15. Pileggi CA, Reynolds CM, Gray C, **Markworth JF**, Zhang ZD, Segovia SA, Vickers MH and Cameron-Smith D. Maternal high fat diet up-regulates markers of skeletal muscle atrophy and inflammation in adult male offspring which is ameliorated by maternal conjugated linoleic acid supplementation. *Australia and New Zealand DOHaD Society Meeting*. April 17-19 (2015).
16. Ihsan, M, Watson, G, Choo, HC, Govus A., Pham T, Hickey A, **Markworth, JF**, Cameron-Smith D, Abbiss CR. Effect of Regular Post-Exercise Cooling on Muscle Aerobic Adaptations to Endurance Training. *19th Annual Congress of the European College of Sport Science*, Amsterdam, The Netherlands. p526. July 2-5 (2014).
17. Peake J, Tan SJ, **Markworth JF**, Skinner T, Cameron-Smith, D. Metabolomic and hormonal responses to high-intensity interval training versus moderate-intensity continuous exercise. *Exercise, Muscle & Metabolism*. Melbourne, Australia, December 4-6, (2013).
18. **Markworth JF**, Vella L, Lingard BS, Tull DL, Rupasinghe TW, Sinclair AJ, Maddipati KR, Cameron-Smith, D. Human inflammatory and resolving lipid mediator responses to resistance exercise and ibuprofen treatment. *Bioactive Lipids in Cancer, Inflammation and Related Diseases, 13th International Conference*, San Juan, Puerto Rico, November 3 - 6 (2013).
19. Chiang, VSC, Pundir, S, Milan, A, Smith, G, **Markworth JF**, D. Cameron-Smith Comprehensive profiling of the metabolomics and hormonal responses to a red meat meal. *Food Structures, Digestion and Health, 2nd International Conference*, Melbourne, Australia, Oct 21-24 (2013).
20. Milan, A, Pundir, S, Pileggi, C, Chiang, V, Lee, W, **Markworth JF**, Cameron-Smith, D. Acute chylomicronaemic and endotoxaemic responses to a high fat breakfast meal: Impact of age. *Food Structures, Digestion and Health, 2nd International Conference*, Melbourne, Australia, Oct 21-24 (2013).
21. Cameron-Smith D, **Markworth JF**, Kaur G, Maddipati KR, and Sinclair AJ. Rapid increases in plasma anti-inflammatory and pro-resolving lipid mediator species with omega-3 EPA and DPA supplementation. *IUNS 20th International Congress of Nutrition*, Granada, Spain, September 15-20 (2013).
22. **Markworth JF**, Vella, LD, Maddipati, KR, and Cameron-Smith, D. Inflammation and resolution in exercise-induced skeletal muscle injury: The effect of NSAID treatment on pro-inflammatory and anti-inflammatory/pro-resolving lipid mediators (2013). *International Journal of Exercise Science: Conference Proceedings*: Vol. 10: Issue. 1, Article 34.
23. **Markworth JF**, Vella L, Maddipati KR, and Cameron-Smith D. Inflammation and resolution in exercise-induced skeletal muscle injury: The effect of NSAID treatment on pro-inflammatory and

anti-inflammatory/pro-resolving lipid mediators. *11th International Society of Exercise and Immunology (ISEI) Symposium*, Newcastle, Australia, 9-12 September (2013).

24. Cameron-Smith, D, **Markworth JF**, Della Gatta, P, and Milan, AM. Prescriptions for physical health: The well-worn road of growing old(er). *11th International Society of Exercise and Immunology (ISEI) Symposium,* New Castle, Australia, September 9-12 (2013).
25. Chiang, VSC; Milan AM; Pundir S; McGill AT; **Markworth, JF**; Smith, G; Poppitt, S; Cameron-Smith, D. Impact of cooking method on inflammatory responses to red meat in young healthy males. *46th Annual Conference of the Nutrition Society of New Zealand*, Auckland, New Zealand, November 22-23 (2012).
26. Pundir, S; Chiang, VSC; Milan, AM; McGill, AT; **Markworth, JF;** Smith, G; Poppitt, S; Cameron-Smith, D. Impact of cooking method on appearance of plasma amino acids from red meat in young healthy males. *46th Annual Conference of the Nutrition Society of New Zealand*, Auckland, New Zealand, November 22-23 (2012).
27. Vella L, **Markworth JF**, Maddipati KR. and Cameron-Smith, D. The resolution of exercise-induced inflammation: Understanding the physiological link between muscle damage and repair. *National Strength and Conditioning Association 35th conference and exhibition*, Rhode Island, USA, July 11-14 (2012).
28. **Markworth JF**, and Cameron-Smith, D. Arachidonic acid stimulates prostaglandin release and skeletal muscle cell growth via a COX dependent pathway. *Bioactive Lipids in Cancer, Inflammation and Related Diseases, 12th International Conference*, Seattle, USA, 2011 September 18-21.
29. **Markworth JF**, and Cameron-Smith, D. Prostaglandin F2 alpha stimulates PI3K/ERK/mTOR signalling and skeletal myotube hypertrophy. *Exercise, Muscle and Metabolism*. Melbourne, Australia (2009).
30. **Markworth JF**. Nutrient sensing mechanisms of insulin resistance: Role of the mTOR signalling pathway. *Exercise, Muscle and Metabolism.* Melbourne, Australia (2007).

RESEARCH GRANTS & FUNDING:

USA:

Total research income: $3,325,535 USD
Research income as Principal Investigator (PI): $202,000 USD

Principal Investigator (PI):

Co-Investigator (Co-I):

2024: **Markworth JF**. & Boerman J. Agricultural Science and Extension for Economic Development (AgSEED) grant, Purdue University College of Agriculture. Implications of skeletal muscle mobilization in early lactation dairy cattle on myofiber remodelling.
Start Date: 03-01-2024, End Date 05-15-2025
Amount awarded: $50,000 USD

2023: Lu X & **Markworth JF**. Indiana Center for Musculoskeletal Health (ICMH), Cancer Team Trainee Pilot Award. The Role of Polyunsaturated Fatty Acids and their Metabolites in Colon Cancer Cachexia
Start Date: 07-01-2023, End Date 06-30-2024
Amount awarded: $2,000 USD

2022**: Markworth JF** and Cooper B. Ralph W. and Grace M. Showalter Trust Awards. Aspirin-triggered lipid mediators in muscle injury and repair.
Start Date 07-01-2022, End Date 07-01-2024
Amount awarded: 75,000 USD

2022: Kuang S, **Markworth JF**, Ferreira C, Zhang C. National Institutes of Health (R01). Metabolic regulation of muscle satellite cell homeostasis mediators of LD function.
Start Date: 09/01/2022, End Date: 08/31/2027
Amount awarded: $3,123,535.00 USD

2018: **Markworth JF** and Brooks SV. Glenn Foundation for Medical Research/American Federation for Aging Research (AFAR) Post-Doctoral Fellowship for Translational Research on Aging. Aging and the resolution of skeletal muscle inflammation.
Start Date: 02-01-2018, End Date: 02-01-2019
Amount awarded: $60,000 USD

New Zealand/Australia:

Total research income: $636,424 NZD
Research income as Principal Investigator (PI): $146,118 NZD

2015: Naot D, Musson D, **Markworth JF**, Fernandez J, Cornish J. Auckland Medical Research Foundation (AMRF). Muscle as a source of bone anabolic factors.
Project Number: 1115009
Start Date: 1-10-2015, End Date: 1-10-2017
Amount awarded: $149,515 NZD

2015: Cameron-Smith D and **Markworth JF.** AgResearch Limited New Zealand. Digestive and nutrient-bioavailability benefits of goat-milk formula in Humans.
Start Date: 1-10-2015, End Date: 1-8-2017
Amount awarded: $265,500.00 NZD

2014: **Markworth JF**, Mitchell C, and Cameron-Smith D. The University of Auckland - Faculty Research Development Fund (FRDF). The effects of dietary arachidonic acid supplementation on human mediator lipidomic profile and skeletal muscle anabolic capacity.
Project Number: 3706927
Start Date: 01-9-2014, End Date: 30-9-2015
Amount awarded: $30,000 NZD

2014: **Markworth JF**, Cameron-Smith D, Guan J. New Zealand Primary Growth Partnership – Fonterra. Effect of dietary phospholipid supplementation on neuromuscular development.
Project Number: 33816.001
Start Date: 1-07-2014 End Date: 30-06-2015
Amount awarded: $81,700 NZD

2013: **Markworth JF** and Cameron-Smith, D. The University of Auckland - Faculty Research Development Fund (FRDF)**.** Role of specialized pro-resolving lipid mediators in physiological and pathological inflammation: Implications on skeletal muscle mass and regenerative capacity.
Project Number: 3704496
Start Date: 05-8-2013, End Date: 05-8-2014
Amount awarded: $34,418 NZD

2013: Cameron-Smith D, **Markworth JF,** Gian J. New Zealand Primary Growth Partnership – Fonterra: Testing dairy fragments in Brain Development and Function – Skeletal muscle sub-contract.
Project Number: 32946.001
Start Date: 22-6-2013 End Date: 22-12-2013
Amount awarded: $75,302 NZD

2012: Vella L, **Markworth JF**, Russell A, Cameron-Smith D. Sport Medicine Australia Research Foundation Grant.
Amount awarded: $2000 AUD

INVITED LECTURES:

2022: *Inflamm-aging: Does Unresolved Inflammation Contribute to Age-related Muscle Dysfunction*? Departmental Seminar. Purdue Center for Aging and the Life Course (CALC). October 7. Purdue University, West Lafayette, IN, USA.

2022: *Local imbalance of inflammatory and resolving lipid mediators limits the regenerative capacity of aging skeletal muscle.* 3rd International Conference on Musculoskeletal and Neural Interactions. August 25-26. Emory University. Atlanta, Georgia, USA.

2022: *Role of Dietary Essential Fatty Acids and their Bioactive Metabolites in Skeletal Muscle Growth and Regeneration.* Departmental seminar. Purdue Interdepartmental Nutrition Program (INP), College of Health and Human Sciences, Purdue University, West Lafayette, IN, USA. March 25th.

2021 *Metabolipidomic Profiling Reveals an Age-Related Deficiency of Skeletal Muscle Proresolving Mediators that Contributes to Maladaptive Tissue Remodelling*. iSLS 9 – 9th International Singapore Lipid Symposium. Singapore. March 1–5.

2020: *Nutritional Determinants of Muscle Growth, Regeneration, and Aging: Role of dietary essential fatty acids*. Departmental seminar. Department of Animal Sciences, College of Agriculture, Purdue University, USA.

2020: *Inflammation and its resolution following skeletal muscle injury: Role of immunoresolving lipid mediators*. Departmental seminar. Ohio Musculoskeletal and Neurological Institute (OMNI). Ohio University, USA.

2018: *Inflammation and its resolution following skeletal muscle Injury: Role of bioactive lipid mediators.* Departmental seminar. School of Medicine, Wayne State University, Michigan, USA.

2017: *The role of inflammation and its successful resolution in adaptive remodelling of skeletal muscle tissue.* Departmental seminar. Department of Orthopedic Surgery, University of Michigan, Michigan, USA.

2016: *Effects of nutrition and exercise on pro-resolving lipid mediators.* Departmental seminar. Liggins Institute, University of Auckland, Auckland, New Zealand.

2016: *The resolution of skeletal muscle inflammation: Effects of nutrition and exercise on pro-resolving lipid mediators.* Departmental seminar. Centre for Experimental Therapeutics and Reperfusion Injury, Brigham and Women's Hospital and Harvard Medical School. Boston, Massachusetts, USA.

2014: *Role of arachidonic acid in regulation of skeletal muscle mass.* SOFAD seminar series, University of Auckland, Auckland, New Zealand.

2012:Inflammation and its role in skeletal muscle growth and regeneration. Departmental seminar. Liggins Institute, University of Auckland, Auckland, New Zealand.

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