BIOGRAPHICAL SKETCH

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NAME: Matthew Jackman

eRA COMMONS USER NAME (credential, e.g., agency login): JACKMAN.M

POSITION TITLE: Senior Instructor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Illinois, Champaign/Urbana, IL	BS	1989	Kinesiology
Arizona State University, Tempe, AZ	MS	1992	Exercise Physiology
Arizona State University, Tempe, AZ	PhD	1997	Exercise Science
University of Colorado Denver, Aurora, CO	Senior Instructor	present	Metabolism/Metabolic disease

A. Personal Statement

*For the Colorado Nutrition Obesity Research Center (**NORC**), I will serve in the following positions: 1) Associate Director of the Molecular and Cellular Analytical (**MCA**) core; and 2) Managing Director of the NORC's animal facilities in the Energy Balance Assessment (**EBA**) core*. During the next award cycle, I will take over all management of the preclinical services of the EBA and become Associate Director, when Dr. MacLean steps down to focus his energies as the NORC Director.

I am a Senior Research Instructor of Medicine in the Division of Endocrinology, Metabolism, and Diabetes, and I have been a member of the NORC research base for more than 20 years. *My professional career has been dedicated to facilitating nutrition and obesity research* in the NORC through my work in building infrastructure, providing technical expertise, and training faculty, fellows, and students, in tools and techniques used for *in vitro* and *in vivo* metabolic phenotyping. I have extensive experience working in the team science environment and coordinating collaborations with researchers from a broad range of disciplines. I am currently a co-investigator on a U54 team science grant (PI-Kohrt), an R01 project grant (MPIs- MacLean, Catenacci, Kabos), and the lead PI on a preclinical contract with a nutraceutical company developing obesity therapeutics. I have over 50 publications, many of which have involved the coordination of nutrition and obesity research in the EBA and MCA cores.

As Associate Director of the MCA core, I will oversee the maintenance, training, and use of the equipment and facilities for *in vitro* metabolic phenotyping and mitochondrial function assays, which includes high resolution respirometry with the Oroboros O2k, high throughput cellular respiration/glycolysis with the Agilent Seahorse, and live cell imaging with the Agilent Cytation1. I have extensive experience with this equipment and in cellular and mitochondrial bioenergetics. I have served in this position helping researchers with these assays for the last 5 years. My track record of success in this leadership role can be assessed in the metrics of productivity presented in the MCA core section of this proposal.

As Managing Director of the EBA core's animal facilities, I will oversee the small animal metabolic phenotyping facilities, equipment, and services. I have more than 15 years' experience overseeing preclinical metabolic phenotyping in the EBA core and have served in this position for over 10 years. I have been intimately involved in the establishment, operation, and expansion of the NORC's metabolic monitoring systems, body composition equipment, and the BioDAQ feed monitoring systems NORC preclinical researchers. In 2022, I was the PI of an institutional SIRC equipment grant to obtain a new EchoMRI for the EBA core, which has been integrated into the EBA cost center that I currently oversee. More recently, I

secured funding and partnerships that double the EBA capacities for EchoMRI body composition measurements, BioDAQ meal patterning measurements, and BioDAQ computerized gate-controlled feed interventions. *In the upcoming cycle I will advance as an Associate Director of the EBA core, when Dr. MacLean steps down to devote more effort to his role as the NORC Director*. Given my background, experience, and track record of success in supporting our research base, I am best qualified and ideally positioned to take on this leadership position to oversee all preclinical services in the NORC's EBA core.

Current and Recently Completed Research Projects to Highlight

Ongoing Projects

NIH P30DK48520 (NORC) MacLean 8/1/20 – 7/31/25
Colorado Nutrition Obesity Research Center
This is a center grant to foster collaborative, interdisciplinary, translational research in nutrition among NIH funded researchers studying nutrition and obesity. The grant supports core laboratories and a pilot program.
Roles: Center Director, Associate Director of Energy Balance Assessment core

NIH/NCIR01 CA258766 MacLean, Kabos, Catenacci 1/1/22-12/31/26
Novel Dietary Interventions for Reducing Obesity-Associated Breast Cancer.
This project will examine the utility of intermittent fasting and time-restricted feeding as strategies for preventing breast cancer recurrence in patient-derived xenograft models and breast cancer survivors, while elucidating the role of cancer-associated fibroblasts in obesity-associated breast cancer.

NIH U54AG062319 (SCORE) Kohrt 9/20/12 – 8/31/28
Bioenergetic and Metabolic Consequences of the Loss of Gonadal Function.
The CO-SCORE contains 3 integrated R01-equivalent, translational research projects examining the impact of gonadal aging on the regulation of bioenergetics, abdominal adiposity, and metabolism.

B. Positions, Scientific Appointments and Honors

Employment:

2024-	Preclinical Managing Director, NORC Energy Balance Assessment Core; Small Animal Phenotyping Services
2019-	Associate Director, NORC Molecular Cellular and Analytical Core, Mitochondrial Function Component
2014-	Director, NORC Animal Satellite Facility; Managing Director of the NORC EBA Small Animal Phenotyping Services.
2011-	Senior Instructor. University of Colorado Denver, Department of Medicine
2005-2010	Instructor. University of Colorado Denver, Department of Medicine, Division of Endocrinology, Metabolism and Diabetes, Center for Human Nutrition
1998-2005	Postdoctoral Research Fellow, UCHSC, Department of Medicine, Division of Endocrinology, Metabolism and Diabetes.
1995-1997	Adjunct Faculty, Biology Department. Chandler Gilbert Community College.
1993-1997	Research and Teaching Associate. Arizona State University
2005-2010	Instructor. University of Colorado Denver, Department of Medicine, Division of Endocrinology, Metabolism and Diabetes, Center for Human Nutrition
2011-	Senior Instructor. University of Colorado Denver, Department of Medicine
2014-	Director, NORC Animal Satellite Facility; Managing Director of the NORC EBA Small Animal Phenotyping Services.
2019-	Associate Director, NORC Molecular Cellular and Analytical Core, Mitochondrial Function Component
2024-	Preclinical Managing Director, NORC Energy Balance Assessment Core; Small Animal Phenotyping Services

C. Contributions to Science

1. **Mitochondrial Function in Health and Disease.**

Prior to working at the Anschutz Medical Campus, my research focused on differences and variations in mitochondrial bioenergetics of skeletal muscle and hepatic tissue. I have performed and published both preclinical and clinical studies on mitochondrial function in hepatic tissue and skeletal muscle. During this time frame, I developed a clamping methodology that allowed for the examination of altered/clamped energetic states across a physiological range of energy states. This methodology is still used frequently, including a recent graduate student of Dr. MacLean. My background in mitochondrial bioenergetics has facilitated my current role as the Associate Director of the Molecular and Cellular Analytical (MCA) core, mitochondrial component. Although my primary focus has shifted over the years, I am still intrigued by all things mitochondrial, and continue to collaborate with individuals across the Anschutz Campus, and at large on mitochondrial studies.

a. **Jackman MR**, Willis WT. Characteristics of mitochondria isolated from type I and type IIb skeletal muscle. Am J Physiol. 1996 Feb;270(2 Pt 1):C673-8. doi: 10.1152/ajpcell.1996.270.2.C673. PMID: 8779934.
b. Messer JI, **Jackman MR**, Willis WT. Pyruvate and citric acid cycle carbon requirements in isolated skeletal muscle mitochondria. Am J Physiol Cell Physiol. 2004 Mar;286(3):C565-72. doi: 10.1152/ajpcell.00146.2003. Epub 2003 Nov 5. PMID: 14602577.
c. **Jackman MR**, Ravussin E, Rowe MJ, Pratley R, Milner MR, Willis WT. Effect of a polymorphism in the ND1 mitochondrial gene on human skeletal muscle mitochondrial function. Obesity (Silver Spring). 2008 Feb;16(2):363-8. doi: 10.1038/oby.2007.40. PMID: 18239645.
d. Perreault L, Newsom SA, Strauss A, Kerege A, Kahn DE, Harrison KA, Snell-Bergeon JK, Nemkov T, D'Alessandro A, **Jackman MR**, MacLean PS, Bergman BC. Intracellular localization of diacylglycerols and sphingolipids influences insulin sensitivity and mitochondrial function in human skeletal muscle. JCI Insight. 2018 Feb 8;3(3):e96805. doi: 10.1172/jci.insight.96805. PMID: 29415895; PMCID: PMC5821197.

2. **Polygenic Predisposition For Obesity.** A number of studies have used a HFD to produce obesity. This singular approach is lacking in that it fails to incorporate genetic factors. Over the last 20yrs, I have performed studies using several different obesity prone and obesity resistant models (Hill and Levin), both of which combine a nutritional factor (HFD) on a polygenic background, thereby mimicking many aspects of human obesity and obesity resistance. I have also used radiolabeled fatty acids in both preclinical and clinical studies for more than 25yrs to measure dietary fat oxidation, and to delineate the trafficking of dietary fatty acids to individual tissues for storage. The inclusion of radio-labelled fatty acid tracers demonstrate that differences in the partitioning of dietary fat between storage in adipose tissue, and oxidation in muscle and liver may in part underlie the differential tendency for lean and obese rats and humans to gain weight.

a. Bessesen DH, Vensor SH, **Jackman MR**. Trafficking of dietary oleic, linolenic, and stearic acids in fasted or fed lean rats. Am J Physiol Endocrinol Metab. 2000 Jun;278(6):E1124-32. doi: 10.1152/ajpendo.2000.278.6.E1124. PMID: 10827016.
b. **Jackman MR**, Kramer RE, MacLean PS, Bessesen DH. Trafficking of dietary fat in obesity-prone and obesity-resistant rats. Am J Physiol Endocrinol Metab. 2006 Nov;291(5):E1083-91. doi: 10.1152/ajpendo.00159.2006. Epub 2006 Jun 27. PMID: 16803858.
c. Bergouignan A, Kealey EH, Schmidt SL, **Jackman MR**, Bessesen DH. Twenty-four hour total and dietary fat oxidation in lean, obese and reduced-obese adults with and without a bout of exercise. PLoS One. 2014 Apr 8;9(4):e94181. doi: 10.1371/journal.pone.0094181. PMID: 24714529; PMCID: PMC3979741.
d. Bessesen DH, Cox-York KA, Hernandez TL, Erickson CB, Wang H, **Jackman MR**, Van Pelt RE. Postprandial triglycerides and adipose tissue storage of dietary fatty acids: impact of menopause and estradiol. Obesity (Silver Spring). 2015 Jan;23(1):145-53. doi: 10.1002/oby.20935. Epub 2014 Oct 30. PMID: 25354893; PMCID: PMC4276527.

3. **Metabolic phenotyping for studies in nutrition and obesity.** I have been performing metabolic phenotyping studies on mice and rats for more than 20yrs. More recently I have been performing the phenotyping studies as a fee for service through the NORC Energy Balance Assessment Core; Small Animal core. I currently run the only metabolic phenotyping core on campus, and the specialized equipment has been uniquely modified so that measures of energy balance can be acquired while assessing nutrient trafficking and

metabolism. In contrast to the vivarium, the core facility is maintained at 28C, a temperature that is thermoneutral for rats, and slightly lower than thermoneutrality for mice. We are also capable of performing experiments under cold stress, at temperatures as low as 4C.

a. **Jackman MR**, MacLean PS, Bessesen DH. Energy expenditure in obesity-prone and obesity-resistant rats before and after the introduction of a high-fat diet. Am J Physiol Regul Integr Comp Physiol. 2010 Oct;299(4):R1097-105. doi: 10.1152/ajpregu.00549.2009. Epub 2010 Aug 4. PMID: 20686168; PMCID: PMC2957378.
b. Morris EM, **Jackman MR**, Johnson GC, Liu TW, Lopez JL, Kearney ML, Fletcher JA, Meers GM, Koch LG, Britton SL, Rector RS, Ibdah JA, MacLean PS, Thyfault JP. Intrinsic aerobic capacity impacts susceptibility to acute high-fat diet-induced hepatic steatosis. Am J Physiol Endocrinol Metab. 2014 Aug 15;307(4):E355-64. doi: 10.1152/ajpendo.00093.2014. Epub 2014 Jun 24. PMID: 24961240; PMCID: PMC4137118.
c. Presby DM, Checkley LA, **Jackman MR**, Higgins JA, Jones KL, Giles ED, Houck JA, Webb PG, Steig AJ, Johnson GC, Rudolph MC, MacLean PS. Regular exercise potentiates energetically expensive hepatic de novo lipogenesis during early weight regain. Am J Physiol Regul Integr Comp Physiol. 2019 Nov 1;317(5):R684-R695. doi: 10.1152/ajpregu.00074.2019. Epub 2019 Sep 25. PMID: 31553623.
d. Presby DM, Rudolph MC, Sherk VD, **Jackman MR**, Foright RM, Jones KL, Houck JA, Johnson GC, Higgins JA, Neufer PD, Eckel RH, MacLean PS. Lipoprotein Lipase Overexpression in Skeletal Muscle Attenuates Weight Regain by Potentiating Energy Expenditure. Diabetes. 2021 Apr;70(4):867-877. doi: 10.2337/db20-0763. Epub 2021 Feb 3.PMID: 33536195.

4. **Supporting Transdisciplinary Research**. Transdisciplinary research models are can be complicated, however the advantage is that the research draws upon a number of researchers from a number of fields that are not directly connected to the research data. The NORC Energy Balance Assessment Core; Small Animal Phenotyping Core has recently acquired a 2nd BioDAQ feeding system (Research Diets), enhancing our capacity from 32 to 64 gated, feeding cages. This increased capacity has facilitated an agreement with a Nutraceutical company outside of the University to perform food intake and meal patterning analyses. Studies proposed are outside of the current academic dogma and should shine light on new protocols and approaches to alleviate food intake/obesity at large. Although blind to the treatments, this is an exciting avenue of research, that we consider viable in the long term.

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/myncbi/matthew.jackman.1/bibliography/public/