

BIOGRAPHICAL SKETCH

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NAME: Fielding, Roger A.

eRA COMMONS USER NAME (credential, e.g., agency login): Roger_A_Fielding
POSITION TITLE: Professor of Nutrition and Medicine
Senior Scientist

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
Boston University, Sargent College, Boston, MA	BS	1983	Applied Physiology
Ball State University, Muncie, IN	MA	1985	Human Bioenergetics
Tufts University, Boston, MA	PhD	1993	Human Nutrition

A. Personal Statement

I have the necessary experience and expertise to successfully serve as Associate Director of the Boston Claude D. Pepper Older Americans Independence center, as Director of the Function Assessment Core, and as Associate Director of the Research Career Development Core. I have over twenty years of experience in the development and conduct of clinical studies of exercise and nutrition in older adults. My work has primarily focused on studies examining the role of skeletal muscle power output on physical function and disability in older adults, as well as parallel studies examining intracellular signaling events in contracting skeletal muscle. We have conducted numerous clinical studies of exercise and muscle function in older adults along with an emerging program in the basic science of age-related muscle atrophy. We have also explored the effects of nutritional, pharmacological, and exercise therapies on changes in skeletal muscle structure and function with advancing age. My laboratory has been at the forefront of the development of tools and instruments to assess muscle performance and physical functioning in older adults. I also currently serve as the PI for the Tufts Field Center for the NIA-funded LIFE Study and ENRGISE pilot study. Throughout my career I have been committed to the training of graduate students, post-doctoral fellows, and junior faculty and continue to develop young talent in geriatrics and gerontology.

B. Positions and Honors

1993-1994 Clinical Assistant Professor, Boston University, Department of Health Sciences
1993-1996 Director Fitness Evaluation Center, Sargent Clinic, Boston University
1993-1998 Scientist III, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, MA (JM USDA HNRCA)
1995-1999 Assistant Professor of Health Sciences, Boston University, Department of Health Sciences
1999-2004 Associate Professor of Health Sciences (tenured), Boston University, Dept of Health Sciences
1999-2004 Director, Human Physiology Laboratory, Boston University, Department of Health Sciences
2004-Present Director, Scientist I, Nutrition, Exercise Physiology, and Sarcopenia Laboratory, JM USDA HNRCA
2005-Present Director, Body Composition Analysis Center, Friedman School of Nutrition Science and Policy, Tufts University (SNSP)
2005-Present Professor of Nutrition, SNSP
2006-2010 Associate Program Director, Clinical Translational Research Center (formerly GCRC, Tufts Medical Center)
2007-Present Director, Body Composition Unit, Boston Nutrition Obesity Research Center

2007-Present Senior Scientist, JM USDA HNRCA
2007-Present Professor of Medicine, Tufts University School of Medicine (TUSM)
2008-Present Associate Director, Boston Older Americans Independence Center for Translational Research in Function Promoting Anabolic Therapies, Boston University-Tufts University

Other Experience and Professional Memberships

1995 Ad hoc reviewer for Department of Veteran's Affairs merit research grant
1996-2004 Member, Boston University Institutional Review Board (Human Studies)
1997-1999 Brookdale Foundation National Fellow
1999 Member, NIH-CSR Special Emphasis Panel, Centers for Mind-Body Interactions and Health
1999 Member, Department of Veteran's Affairs Review Panel, Physiological Foundations of Physical Performance and Combat Readiness
2002-2014 Lecturer on Physical Medicine and Rehabilitation, Harvard Medical School, Department of Physical Medicine and Rehabilitation
2003 Review Panel Member, NASA/ESA/CNES International Long-term Bed Rest Study
2003 Member, NIA Special Emphasis Panel, Metabolic Effects of Bedrest
2003-2008 Charter Member, Aging Systems and Geriatrics Study Section, PHS-NIH
2010-2012 Member, NIH, Center for Scientific Review, College of Reviewers
2003-Present Member, Brookdale Institute on Aging
2004-Present Member, American Federation for Aging Research, National Scientific Advisory Council
2009-Present Scientific Advisory Board, NASA, Nutrition Research and Countermeasures Program
2012-Present Associate Editor, Journal of Gerontology Medical Sciences
2013-Present Associate Editor, Exercise and Sports Science Reviews
2013-Present Associate Editor, Calcified Tissues and Musculoskeletal Research International
2015 International Osteoporosis Foundation Olof Johnell Science Award
2015 Nutrition Impact Award, Tufts University, Friedman School of Nutrition Science and Policy

C. Contributions to Science

Skeletal muscle power and aging: My group has conducted the pioneering work of identifying the age-related changes in skeletal muscle power production as a strong independent risk factor for deficits in physical functioning and disability among older adults. We also described for the first time the roles of neuromuscular activation and intrinsic skeletal muscle force generating capacity on the decline in muscle power with advancing age in humans.

1. Bean J.F., Kiely D.K., Herman S., Leveille S.G., Mizer K., Frontera W.R., Fielding R.A. The relationship between leg power and physical performance in mobility-limited older people. *Journal of the American Geriatrics Society* 2002;50(3):461-7
2. Clark D.J., Patten C., Reid K.F., Carabello R.J., Phillips E.M., Fielding R.A. Impaired voluntary neuromuscular activation limits muscle power in mobility-limited older adults. *The journals of gerontology Series A, Biological sciences and medical sciences* 2010;65(5):495-502 PMID: PMC2854883
3. Reid K.F., Doros G., Clark D.J., Patten C., Carabello R.J., Cloutier G.J., Phillips E.M., Krivickas L.S., Frontera W.R., Fielding R.A. Muscle power failure in mobility-limited older adults: preserved single fiber function despite lower whole muscle size, quality and rate of neuromuscular activation. *European journal of applied physiology* 2012;112(6):2289-301 PMID: PMC3394542
4. Reid K.F., Martin K.I., Doros G., Clark D.J., Hau C., Patten C., Phillips E.M., Frontera W.R., Fielding R.A. Comparative effects of light or heavy resistance power training for improving lower extremity power and physical performance in mobility-limited older adults. *The journals of gerontology Series A, Biological sciences and medical sciences* 2015;70(3):372-8 PMID: PMC4351393

Age-related changes in skeletal muscle growth capacity: I have led translational studies of the age-related changes in skeletal muscle growth capacity and have investigated the underlying mechanisms of these changes. Our work has highlighted the role of excess intramyocellular lipid accumulation on deficits in anabolic signaling. In addition, we have recently discovered that small non-coding micro RNA in skeletal muscle play a role in the differential response to exercise stimuli in young and older humans.

1. Parkington J.D., LeBrasseur N.K., Siebert A.P., Fielding R.A. Contraction-mediated mTOR, p70S6k, and ERK1/2 phosphorylation in aged skeletal muscle. *Journal of applied physiology* 2004;97(1):243-8
2. Rivas D.A., Morris E.P., Fielding R.A. Lipogenic regulators are elevated with age and chronic overload in rat skeletal muscle. *Acta physiologica* 2011;202(4):691-701 PMID: PMC3995003
3. Rivas D.A., Morris E.P., Haran P.H., Pasha E.P., Morais Mda S., Dolnikowski G.G., Phillips E.M., Fielding R.A. Increased ceramide content and NFkappaB signaling may contribute to the attenuation of anabolic signaling after resistance exercise in aged males. *Journal of applied physiology* 2012;113(11):1727-36 PMID: PMC3774074
4. Rivas D.A., Lessard S.J., Rice N.P., Lustgarten M.S., So K., Goodyear L.J., Parnell L.D., Fielding R.A. Diminished skeletal muscle microRNA expression with aging is associated with attenuated muscle plasticity and inhibition of IGF-1 signaling. *FASEB journal : official publication of the Federation of American Societies for Experimental Biology* 2014;13:14-254490 PMID – PMC Journal In Process

Exercise and nutrition interactions in older adults: Throughout my career I have tried to examine the synergistic effects of exercise and dietary intake. We have recently completed a randomized trial combining a high quality protein supplement (40 g whey) on resistance exercise-induced changes in muscle mass and function. In addition, we have an emerging interest on the role of vitamin D on skeletal muscle function.

1. Pojednic R.M., Ceglia L., Lichtenstein A.H., Dawson-Hughes B., Fielding R.A. Vitamin D receptor protein is associated with interleukin-6 in human skeletal muscle. *Endocrine* 2014 NIHMS683476
2. Pojednic R.M., Ceglia L., Olsson K., Gustafsson T., Lichtenstein A.H., Dawson-Hughes B., Fielding R.A. Effects of 1,25-dihydroxyvitamin d3 and vitamin d 3 on the expression of the vitamin d receptor in human skeletal muscle cells. *Calcified tissue international* 2015;96(3):256-63 NIHMS683480
3. Chale A., Cloutier G.J., Hau C., Phillips E.M., Dallal G.E., Fielding R.A. Efficacy of whey protein supplementation on resistance exercise-induced changes in lean mass, muscle strength, and physical function in mobility-limited older adults. *The journals of gerontology Series A, Biological sciences and medical sciences* 2013;68(6):682-90 PMID: PMC3708517
4. Kirn DR, Koochek A, Reid KF, et al. **The Vitality**, Independence, and Vigor in the Elderly 2 Study (VIVE2): Design and methods. *Contemp Clin Trials* 2015;43:164-71 PMID – PMC Journal In Process

Metabolomic predictors of body composition and function: We have employed mass spectrometry (MS)-based metabolomics to investigate mechanisms that may underlie the maintenance of skeletal muscle mass and physical function. We reported associations between gut bacteria-related metabolites, branched chain amino acids (BCAAs), metabolites related to uremia, oxidative stress and inflammation with percent lean mass or aerobic capacity in young adults. We have also shown associations between BCAAs and gut bacteria-related metabolites with lean and skeletal muscle mass and with markers of insulin resistance and inflammation, and identified the amino acid glycine as an insulin resistance-associated marker of regional adiposity in older adults. We have also observed significant associations between circulating gut bacteria-related metabolites with measures of physical function in both young and older adults.

1. Lustgarten M.S., Price L.L., Chale A., Fielding R.A. Metabolites related to gut bacterial metabolism, peroxisome proliferator-activated receptor-alpha activation, and insulin sensitivity are associated with physical function in functionally-limited older adults. *Aging cell* 2014;13(5):918-25 PMID: PMC4331755
2. Lustgarten M.S., Price L.L., Chale A., Phillips E.M., Fielding R.A. Branched chain amino acids are associated with muscle mass in functionally limited older adults. *The journals of gerontology Series A, Biological sciences and medical sciences* 2014;69(6):717-24 PMID: PMC4073623
3. Lustgarten M.S., Price L.L., Phillips E.M., Fielding R.A. Serum glycine is associated with regional body fat and insulin resistance in functionally-limited older adults. *PLoS one* 2013;8(12):e84034 PMID: PMC3877144
4. Lustgarten MS, Price LL, Fielding RA. Analytes and Metabolites Associated with Muscle Quality in Young, Healthy Adults. *Med Sci Sports Exerc* 2015;47:1659-64 PMID – PMC Journal In Process

Exercise training/physical activity in older adults: Our group has contributed extensively to work on the role of exercise training and physical activity on changes in muscle strength power and function in older adults. We were recently part of the team that successfully completed the LIFE study that showed that a sustained

program of physical activity can significantly reduce incident and persistent mobility disability in at risk older adults.

1. Fielding R.A., LeBrasseur N.K., Cuoco A., Bean J., Mizer K., Fiatarone Singh M.A. High-velocity resistance training increases skeletal muscle peak power in older women. *Journal of the American Geriatrics Society* 2002;50(4):655-62
2. Ouellette M.M., LeBrasseur N.K., Bean J.F., Phillips E., Stein J., Frontera W.R., Fielding R.A. High-intensity resistance training improves muscle strength, self-reported function, and disability in long-term stroke survivors. *Stroke; a journal of cerebral circulation* 2004;35(6):1404-9
3. Fielding R.A., Rejeski W.J., Blair S., Church T., Espeland M.A., Gill T.M., Guralnik J.M., Hsu F.C., Katula J., King A.C., Kritchevsky S.B., McDermott M.M., Miller M.E., Nayfield S., Newman A.B. The Lifestyle Interventions and Independence for Elders Study: design and methods. *The journals of gerontology Series A, Biological sciences and medical sciences* 2011;66(11):1226-37 PMID: PMC3193523
4. Pahor M., Guralnik J.M., Ambrosius W.T., Blair S., Bonds D.E., Church T.S., Espeland M.A., Fielding R.A., Gill T.M., Groessl E.J., King A.C., Kritchevsky S.B., Manini T.M., McDermott M.M., Miller M.E. Effect of structured physical activity on prevention of major mobility disability in older adults: the LIFE study randomized clinical trial. *JAMA* 2014;311(23):2387-96 PMID: PMC4266388

Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/roger.fielding.1/bibliography/41154172/public/?sort=date&direction=ascending>

D. Research Support

1950-51000-068-01S Fielding (PI) 10/01/14-09/30/19
USDA/ARS

Nutrition, Physical Activity, and Sarcopenia in the Elderly This grant supports the core functions of the Nutrition, Exercise Physiology and Sarcopenia Laboratory and its mission is to conduct research into how exercise and diet can influence age-related loss of skeletal muscle mass and function (sarcopenia). Projects include both human and animal studies, ranging from the molecular level to population-based observational and intervention studies.

Role: Principal Investigator

U01 AG022376-08 Pahor (PI) 09/30/09-11/30/15
NIH/NIA

Lifestyle Interventions for the Elderly (LIFE) The major goal of the project is to conduct a pilot randomized controlled trial to compare a structured physical exercise program with a health education control in sedentary older persons at risk of disability.

Role: Principal Investigator of Tufts' subcontract

R01AG01303 Seals (PI) 08/01/14-04/30/19
Nitrite Supplementation for Improving Physiological Function in Older Adults The major goal of this project is to examine the role of nitrite supplementation on vascular function and physical functioning in older at risk adults.
Role: Principal Investigator of Tufts' subcontract

Nestec, Corp CTA#10.27.CLI Fielding (PI) 10/09/10-10/10/15
Exercise & Nutrition Efficacy This study will further define our understanding of the role of high quality nutritional supplement on whole body physical functioning and accrual of fat free mass in older individuals with objectively measured functional limitations.
Role: Principal Investigator

P30 AG031679-05 Bhasin (PI) 09/01/08-05/31/14 (NCE)
NIH/NIA
Boston Older Americans Independence Center: A Translational Approach to Function Promoting Anabolic Therapies The major goals of the Boston OAIC are to expedite the translation of research results into evidence-based function promoting anabolic therapies and to nurture a new generation of aging researchers.

Role: Principal Investigator of Tufts' subcontract

R24 HD065688-04
NIH/NIA

Jette (PI)

09/23/10-05/31/15 (NCE)

Improving Outcome Measurement for Medical Rehabilitation Clinical Trials The overall aim of the Performance-based Measures core is to improve and expand the utilization of performance-based measures of physical functioning in clinical trials of medical rehabilitation.

Role: Principal Investigator of Tufts' subcontract

R01 AT006367-03
NIH/NIA

Wang (PI)

08/01/11-06/30/15 (NCE)

Tai Chi and Fibromyalgia This study compares the effects of Tai Chi in patients with fibromyalgia in functioning for improving quality of life.

Role: Co-Investigator

P30 DK46200-22
NIH/NIDDK

Fried (PI)

04/01/09-03/31/18

Boston Obesity Nutrition Research Center Dr. Fielding serves as the Director of the Body Composition Unit for the BONRAC Clinical and Community Research Methods Core. He oversees the operation and quality control of the DXA and bioimpedance.

Role: Co-Investigator of Tufts' subcontract

R01 DK090401-03
NIH/NIDDK

Weiner (PI)

09/02/11-08/31/15

Effects of exercise training on cognition and functional performance in CKD The aims of this study are to compare the effects of 12 months of aerobic exercise training versus directed health education on Chronic Kidney Disease (CKD) patients.

Role: Principal Investigator of Tufts' subcontract

Regeneron Pharmaceuticals, Inc.

Fielding (PI)

07/01/13-06/30/14 (Ongoing)

A randomized, double-blind, placebo-controlled, multicenter study of The effects of repeated doses of subcutaneous REGN 1033 treatment, with and without exercise, on safety, body composition, muscle strength and stair climb power in male and female subjects aged 60 and older

Phase I study of anti-myostatin antibody on skeletal muscle mass and function.

Role: Principal Investigator

Pending Support

UO1AG050499

Pahor (PI)

09/01/15-08/31/18

The ENRGISE Study The major goal of this project is to conduct a pilot and feasibility study to evaluate the effects of Losartan and/or omega-three fatty acid supplementation on measures of physical functioning and inflammatory markers in older mobility-limited adults.

Role: Principal Investigator of Tufts' subcontract

R01AT008790

Wang (PI)

04/01/16-03/31/21

Tai Chi for Osteoarthritis Pain and Inflammation in Obese Older Adults The major goal of this project is to compare the effects of Tai Chi to structured exercise on pain inflammation and physical functioning in obese older adults with osteoarthritis.

Role: Principal Investigator of Tufts' subcontract