

BIOGRAPHICAL SKETCH

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NAME: Roger A. Fielding

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POSITION TITLE: Professor of Nutrition and Medicine, Senior Scientist, Associate Center Director

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. I have successfully collaborated with Drs. Bhasin, Lipsitz, Kiel, Marcantonio, Montano, Wagers, Jasuja and Trivison for the 5 years of the current project period. We have developed a fully integrated center which seeks to expand the footprint of research into function promoting therapies for older adults across our respective institutions. My research interests for the last 20 years have focused on age-associated declines in skeletal muscle mass and function, or sarcopenia. I have led basic science, observational, and intervention studies that examined the etiology of age-associated changes in the structure and function of skeletal muscle and evaluated the effects of therapeutic interventions on these alterations. My laboratory has been at the forefront of the development of tools and instruments to assess muscle performance and physical functioning in older adults. Outside the laboratory, I serve as Associate Director of the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University and Chair of the Aging Systems and Geriatrics Study Section of the National Institutes of Health (NIH) Center for Scientific Review. My laboratory has extensive expertise in the design and implementation of multicenter and single-site randomized controlled trials in older adults. I also have been continually funded by the NIH for the last 20 years and have authored over 200 publications in leading peer-reviewed journals in areas relevant to this application (over 31,000 citations; h-index: 93). I have successfully trained over 20 M.S. students, 10 Ph.D. students and a total of 10 post-doctoral researchers and fellows. The majority of my trainees have gone on to successful academic and/or clinical careers. I am currently primary mentor to two K01 awardees in my laboratory.

B. Positions and Honors

1993-1994	<u>Clinical Assistant Professor</u> , Boston University, Department of Health Sciences 1993-1996 <u>Director Fitness Evaluation Center</u> , Sargent Clinic, Boston University
1993-1998	<u>Scientist III</u> , Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, MA (JM USDA HNRCA)
1995-1999	<u>Assistant Professor of Health Sciences</u> , Boston University, Department of Health Sciences
1999-2004	<u>Associate Professor of Health Sciences (tenured)</u> , Boston University, Department of Health Sciences
1999-2004	<u>Director Human Physiology Laboratory</u> , Boston University, Department of Health Sciences
2006-2010	<u>Associate Program Director</u> , Clinical Translational Research Center (formerly GCRC, Tufts Medical Center)
2007-2016	<u>Director</u> , Body Composition Unit, Boston Nutrition Obesity Research Center
2015	International Osteoporosis Foundation Olof Johnell Science Award

2015 Nutrition Impact Award, Tufts University, Friedman School of Nutrition Science and Policy
 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,
 2005-Present Professor of Nutrition, Tufts University Friedman School of Nutrition Science and Policy
 2007-Present Senior Scientist, JM USDA HNRCA
 2007-Present Professor of Medicine, Tufts University School of Medicine (secondary appointment)
 2008-Present Associate Director, Boston Older Americans Independence Center for Translational Research in Function Promoting Anabolic Therapies, Boston University-Tufts University
 2017-2018 Interim Associate Center Director, JM USDA HNRCA
 2018-Present Associate Center Director, JM USDA HNRCA

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
 2002-2007 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
 2013 Co-chair, NIH/NHLBI Sedentary Behavior Workshop 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 and Musculoskeletal Tissues International
 2019-Present Chair, Aging Systems and Geriatrics Study Section, PHS-NIH

C. Contributions to Science

1. 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 (20 g per day) 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.

- a. 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. *J Gerontol Med Sci* 2013; 68(6):682-90. PMID: PMC3708517.
- b. **Fielding R.A.**, Trivison T.G., Kirn D.R., Koochek A., Reid K.F., von Berens A., Zhu H., Foltz S.C., Sacheck J., Nelson M.E., Liu C.K., Åberg A.C., Nydahl M.C., Lilja M., Gustafsson T., Cederholm T. Effect of structured physical activity and nutritional supplementation on physical function in mobility-limited older adults: Results from the VIVE2 randomized trial. *J Nutr Health and Aging* 2017; 21(9): 936-942. PMID: PMC6751564.
- c. Englund D.A., Kirn D.R., Koochek A., Zhu H., Trivison T.G., Reid K.F., von Berens A., Mein M., Cederholm T., Gustafsson T., and **Fielding R.A.** Nutritional supplementation with physical activity improves muscle composition in mobility-limited older adults, The VIVE2 Study: A randomized double-blind placebo-controlled trial. *J Gerontol Med Sci* 2017; 73(1): 95-101. PMID: PMC6555188.
- d. Pahor M., Anton S.D., Beavers D.P., Cauley J.A., **Fielding R.A.**, Kritchevsky S.B., Leeuwenburgh C., Lewis K.H., Liu C., Lovato L., Lu J., Manini T.M., McDermott M.M., Miller M.E., Newman A.B., Radziszewska B., Stowe C., Tracy R.P., Walkup M., Wu S., Ambrosius W.T.

Effect of losartan and fish oil on plasma IL-6 and mobility in older persons: The ENRGISE Pilot randomized clinical trial. *J Gerontol Med Sci* 2018 Dec 12. doi: 10.1093/gerona/gly277. [Epub ahead of print]. PMID: PMC6748815.

2. **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 which showed that a sustained program of physical activity can significantly reduce incident and persistent mobility disability in at risk older adults.
 - a. **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. *J Gerontol Med Sci* 2011; 66(11):1226-37. PMID: PMC3193523.
 - b. 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.
 - c. **Fielding R.A.**, Guralnik J.M., King A.C., Pahor M., McDermott M.M., Tudor-Locke C., Manini T.M., Glynn N.W., Marsh A.P., Axtell R.S., Hsu F.C., Rejeski W.J., LIFE study group. Dose of physical activity, physical functioning and disability risk in mobility-limited older adults: Results from the LIFE study randomized trial. *PLoS One* 2017; 12(8):e0182155. doi: 10.1371/journal.pone.0182155. eCollection 2017. PMID: PMC5562326.
 - d. Trombetti A., Hars M., Hsu F.C., Church T.S., Gill T.M., King A.C., Liu C.K., Manini T.M., McDermott M.M., Newman A.B., Rejeski W.J., Guralnik J.M., Pahor M., **Fielding R.A.** Effect of physical activity on frailty: secondary analysis of a randomized controlled trial. *Ann Intern Med* 2018; 168(5):309-316. PMID: PMC5898617.
3. **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 with advancing age in humans.
 - a. 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. *J Gerontol Med Sci* 2010;65(5):495-502. PMID: PMC2854883.
 - b. 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. *Eur J Appl Physiol* 2012;112(6):2289-301. PMID: PMC3394542.
 - c. Kirn D.R., Reid K.F., Hau C., Phillips E.M., **Fielding R.A.** What is a Clinically Meaningful Improvement in Leg-Extensor Power for Mobility-limited Older Adults? *The journals of gerontology Series A, Biological sciences and medical sciences* 2016; 71(5):632-6. PMID: PMC5007740.
 - d. Englund, D.A., Price L.L., Grosicki G.J., Iwai M., Kashiwa M., Liu C., Reid K.F., **Fielding R.A.** Progressive resistance training improves torque capacity and strength in mobility-limited older adults. *J Gerontol Med Sci* 2019; 74 (8): 1316-1321. PMID: PMC6625591.
4. **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.
 - a. 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. *J Appl Physiol* 2012; 113(11):1727-36. PMID: PMC3774074.
 - b. 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 J* 2014; 28(9):4133-4147. PMID: PMC5058318.

- c. Rivas D.A., McDonald D.J., Rice N.P., Haran P.H., Dolnikowski G.G., **Fielding R.A.** Diminished anabolic signaling response to insulin induced by intramuscular lipid accumulation is associated with inflammation in aging but not obesity. *Am J Physiol- Reg I* 2016; 310(7): R561-9. PMID: PMC4867383.
- d. Rivas D.A., Rice N.P., Ezzyat Y., McDonald D.J., Cooper B.E., **Fielding R.A.** Spingosine-1-phosphate analog FTY720 reverses obesity but not age-induced anabolic resistance to muscle contraction. *Am J Physiol-Cell Ph* 2019; 317(3):C502-C512. PMID: PMC6766615.
5. **Metabolomic/microbiome 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.
- a. 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.
- b. 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. *J Gerontol Med Sci* 2014;69(6):717-24. PMID: PMC4073623.
- c. Lustgarten M.S., **Fielding, R.A.** Metabolites Associated with Circulating Interleukin-6 in Older Adults. *J Gerontol Med Sci* 2017; 72(9): 1277- 1283. PMID: PMC6279159.
- d. **Fielding RA**, Reeves AR, Jasuja R, Liu C, Barrett BB, Lustgarten MS. Muscle strength is increased in mice that are colonized with microbiota from high-functioning older adults. *Exp Gerontol.* 2019;127:110722. PMID: PMC6823114.

Complete List of Published Work in My Bibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/roger.fielding.1/bibliography/public/>

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

8050-51000-104-01S / USDA/ARS Fielding (PI) 09/15/19-09/14/24

Nutrition, Sarcopenia, Physical Function, and Skeletal Muscle Capacity During Aging

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.

P30 AG031679 / NIH/NIA Bhasin (PI) 07/01/16-06/30/21

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: PI of Tufts subcontract/Associate Center Director

BIO101-CL02 / Biophytis S.A./ICON Fielding (PI) 05/01/17-09/30/20

Characterising SARcopenia and sarcopenic obesity in patients Aged 65 years and over, at risk of mobility disability. An Observational Clinical Trial

The major goal of this single arm phase 2 clinical trial is to study 300 community dwelling older adults reporting loss of physical function and are at risk of mobility disability. Participants will undergo mobility functional evaluation and dual-energy x-ray absorptiometry (DXA) scan for body composition.

BIO101-CL03 / Biophytis S.A./ICON Fielding (PI) 07/16/18-07/31/20
Safety and Efficacy of BIO-101 175 mg b.i.d. and 350 mg b.i.d. 26-week oral administration to patients suffering from age-related SARcopenia, including sarcopenic obesity. Aged >65 years and at risk of mobility disability. A double-blind, placebo controlled, randomized INTerventional Clinical Trial
The major goal of this project is to examine the efficacy of BIO-101 on lean mass and mobility on older mobility limited adults.

1R01DK115562-01A1 / NIH/NIA Shlipak & Coca (MPI) 07/01/18-06/30/21
Impact of exercise on kidney function and Injury among elders in the LIFE trial
The goal of this project is to measure the impact of structured physical activity (SPA) intervention compared with a health education (HE) intervention on reducing kidney function decline.
Role: PI of Tufts subcontract

R01 HD088061 / NIH/NICHHD Catalano & Kirwan (MPI) 08/16/18-11/30/21
*reflects start date of Tufts University subcontract
Lifestyle Intervention in Preparation for Pregnancy (LIPP)
The goal of this project is improving maternal metabolic conditioning before a subsequent pregnancy in overweight and obese women after their first pregnancy through a randomized control trial of lifestyle intervention.
Role: PI of Tufts subcontract

1R01AG055529-01A1 / NIH/NIA LeBrasseur (PI) 08/15/18-03/31/23
Senescence and Growth and Differentiation Factors as Modifiers of Aging
The goal of this project is to develop data on measures of senescence-related factors in human samples from previously conducted randomized trials in older adults.
Role: PI of Tufts subcontract

5R01AG055443 / NIH/NIA Ceglia (PI) 09/30/18-02/29/24
Impact of protein and alkali supplementation on skeletal muscle in older adults
To determine whether an alkaline salt supplement (potassium bicarbonate) can enhance the beneficial impact of a high protein diet on muscle performance and mass.
Role: Co-investigator

Lonza Work Order #2 / Lonza Fielding (PI) 07/01/16-02/28/21 (NCE)
Therapeutic Role of L-Carnitine and Creatine in Skeletal Muscle Hypertrophy
The major goal of this project is to evaluate the effect of Carnitine and Creatine intake on skeletal muscle protein synthesis.

1R21AR074138-01A1 / NIH/NIAMS Dawson-Hughes (PI) 04/10/19-02/28/22
Effect of a ghrelin receptor agonist on muscle and bone
The major goal of this project is to determine the effect of a ghrelin receptor agonist on bone remodeling, lean tissue mass, and muscle function in adults with low bone and muscle mass.
Role: Co-investigator

Completed Research Support

R21 AG060389 / NIH/NIA Haynes (PI) 08/15/18-04/30/20
Impact of aging and influenza respiratory tract infection on muscle health
The goal of this project is to identify mediators involved with age-related flu-induced myopathies that will help us to formulate mechanistic hypotheses about how this happens and how it can be prevented in order to keep elderly people healthier longer.
Role: Co-investigator

R01 AG01303 / NIH/NIA Seals (PI) 04/01/14-03/31/20
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: PI of Tufts subcontract