

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2. Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Shalender Bhasin	POSITION TITLE Professor of Medicine		
eRA COMMONS USER NAME SHBHASIN			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
D.A. V. College, Chandigarh (India)	Pre-Med	1970	Pre-Med
All India Institute of Medical Sciences, New Delhi, India	M.B., B.S.	1976	Medicine
Northwestern Univ. Med. School, Chicago	Resident	1978-81	Internal Medicine

A. Personal Statement

I am a translational investigator with nearly 30 years of experience in randomized trials of function-promoting therapies, including pharmacological, nutritional, and exercise interventions. I lead a large interdisciplinary research program in function promoting therapies focused on efficacy trials, mechanisms of action, and target identification and validation. My expertise in these content areas is reflected in over 250 peer-reviewed manuscripts, 120 book chapters and reviews, two books, and over 600 abstracts. I have conducted numerous NIH-funded, single site as well as multi-center, randomized trials of the effects of exercise, nutritional, and pharmacological interventions in young and older adults with mobility limitation, falls, chronic obstructive lung disease, HIV-infection, and end stage renal disease.

In addition to successfully completing some of the most important trials of androgens, myostatin antagonists, and exercise interventions, my laboratory has made major contributions to science, including the publication of conclusive evidence of the anabolic effects of androgens; demonstration that resistance exercise training augments the anabolic effects of androgens on muscle mass and strength; characterization of the testosterone dose response relationships in men and women; elucidation of the mechanisms of androgen action on the muscle and erythropoiesis; clarification of the role of steroid 5 α -reductase enzymes in adult men; elucidation of a new model of testosterone's binding to sex hormone binding globulin and development of an algorithm for calculating free testosterone concentrations; and cloning and characterization of the human myostatin gene, development of a myostatin assay, and conducting efficacy trials of myostatin antagonists.

I have served as an Associate Editor of the Journal of Clinical Endocrinology and Metabolism and the Journal of Andrology, Chair of the Clinical Guidelines Subcommittee of the Endocrine Society, and as the Chair of the American Board of Internal Medicine (Endocrinology and Metabolism). I chaired the Endocrine Society's expert panel that developed clinical guidelines for testosterone therapy of androgen deficiency syndromes in men. I serve as the Director of the Boston Claude D. Pepper Older Americans Independence Center, which is a collaboration among investigators from multiple academic institutions in the Boston metropolitan area aimed at providing infrastructural support for research in function promoting therapies.

My expertise in randomized trials of function promoting therapies, muscle biology, energetics and metabolism, my leadership experience as a Section Chief, a Center Director, and as a chair of national and international committees, my longstanding collaborative association with Drs. Montano and Storer, and more recently, Dr. Reisner at Fenway Health on transgender health, make me uniquely qualified as a Co-I in this project on inflammaging and functional capacity in transgender women, with and without HIV infection.

Positions and Employment

1984 - 1988 Assistant Professor, In-residence, UCLA School of Medicine

1988 - 1994 Associate Professor, In-residence, UCLA School of Medicine
 1994 - 2005 Professor of Medicine, In-residence, UCLA School of Medicine
 1996 - 2005 Chief, Division of Endocrinology, Metabolism and Molecular Medicine, Drew University
 1999 - 2005 Associate Chair for Academic Affairs, Department of Medicine
 2003- 2005 Director, Drew-UCLA Reproductive Science Research Center
 2005 - Professor of Medicine, Boston University School of Medicine, and Chief, Section of Endocrinology, Diabetes, and Nutrition, Boston Medical Center
 2008- Director, Boston Claude D. Pepper Older Americans Independence Center
 02/2013- Director, Research Program in Men's Health: Aging and Metabolism, Brigham and Women's Hospital, Harvard Medical School
 06/2014- Professor of Medicine, Harvard Medical School
 10/1/2014- Director, The Center for Clinical Investigation, Brigham and Women's Hospital

Other Experience and Professional Memberships

Member, American Board of Internal Medicine (Endocrinology and Metabolism Exam Writing Committee) 7/1/2005-7/1/2015; Chair, American Board of Internal Medicine, Endocrinology and Metabolism Subspecialty Board 7/1/2011-7/1/2015; Chair, Endocrine Society's Expert Panel for Development of Guidelines for Androgen Deficiency Syndromes in Men 6/2005-present; Chair, Endocrine Society's Clinical Guidelines Subcommittee 7/1/2008-6/30/2011; Member, the Council of the Endocrine Society 7/1/2011- 7/1/2014; Associate Editor, Journal of Andrology, 1997-2002; Associate Editor, J Clin Endocrinol Metab 1/2005-12/2009 7/2011- ; Chair, NIDDK Ad Hoc Study Section 1999; Protocol Chair, ACTG 5079, 1999-2005. Member, HIV ACE Study Section, 2002-2006; Chair, Ad Hoc Special Emphasis Panel AARV-6, NIDDK RFA on HIV-Associated Lipodystrophy; Temporary Member ASG Study Section, 2005-2008; President, Western Society for Clinical Investigation 2003; Member, CSR College of Scientific Reviewers 2010-2012; Reviewer for Special Emphasis Panel for Juvenile Protective Factors, 12/2012, 6/2013, 9/2013; 6/2014; K23 review panel 12/23; NIA Special Emphasis Panel for Vitamin D RFA 1/2014; NIA Special Emphasis Panel for Neuromuscular Junction 6/2015; Special Emphasis Panel on HIV and Aging 6/2014; 11/2014; 07/2015; Special Emphasis Panel for Anti-Geronic Factors 11/2015

Honors

1976 Graduate of the Year Gold Medal at AIIMS; 1980 Walter Rombach Intern of the Year Award (Northwestern University); 1984 Weitzman Award for the Best Fellow (Harbor-UCLA Medical Center); 1990 Richard Weitzman Young Investigator Award; 1990 Harbor-UCLA Distinguished Teaching Award; 1999 Drew Teaching Award; UT Southwestern Medical School GCRC Award for Excellence in Patient-Oriented Research, 2000; Harbor-UCLA GCRC Second Prize for Excellence in Clinical Research 2002; JCEM Pharmacia Finalist Award for Best Clinical Research Paper 2003; Mentor for Annals of Internal Medicine's Early Career Author Award 10/2012; The Endocrine Society's Research Mentor Award (Mentee: Grace Huang); Top Doctors of America 2005, 2011, 2012, 2013, 2014, 2015; Outstanding Clinical Investigator Award, the Endocrine Society, 2015

C. Selected peer-reviewed Publications (from 250 peer-reviewed manuscripts, 120 chapters and reviews, >600 abstracts, and 2 books)

My complete bibliography can be obtained at

<http://www.ncbi.nlm.nih.gov/sites/myncbi/shalendar.bhasin.1/bibliography/40528776/public/?sort=date&direction=descending>

Most relevant to the current application.

Manuscripts documenting expertise in randomized trials of function promoting therapies:

These publications highlight the investigator's expertise in randomized trials of function promoting therapies, including pharmacological, exercise and nutritional interventions, and document the study team's experience in recruiting and retaining participants in randomized trials. Among these publications 1, 2, and 8 included an exercise intervention.

1. Bhasin S, TW Storer N, Berman C, Callegari R, Tricker R, Casaburi R. The effects of supraphysiological doses of testosterone on muscle size and strength in normal men. N Engl J Med 1996;335:1-7. PMID: 8637535
2. Bhasin S, Storer TW, Berman N, Hays R, Beall G. Effects of testosterone replacement and resistance exercise in HIV-infected men with weight loss and low testosterone levels. JAMA 2000;283:756-762. PMID: 1068305
3. Basaria S, Coviello A, Travison TG, Storer TW, Farwell WR, Jette A, Eder R, Tennstedt S, Ulloor J, Zhang A, Choong K, Lakshman K, Mazer NA, Miciek R, Krasnoff J, Elmi A, Knapp P, Brooks B, Bhasin G, Appleman E, Aggarwal S, Collins L, LeBrasseur N, Fiore L, Bhasin S. Adverse effects associated with testosterone administration in older men. N Engl J Med 2010;363:109-22. PMID 2059229
4. Bhasin S, Travison TG, Storer TW, Lakshman K, Kaushik M, Mazer NA, Ngyuen AH, Davda MN, Jara H, Aakil A, Anderson S, Knapp PE, Hanka S, Mohammed N, Daou P, Miciek R, Ulloor J, Zhang A, Brooks B, Orwoll K, Hede-Brierley L, Eder R, Elmi A, Bhasin G, Collins L, Singh R, Basaria S. Effect of testosterone supplementation with and without a dual 5 α -reductase inhibitor on fat-free mass in adult men with suppressed testosterone production: a randomized trial. JAMA 2012;307:931-9. PMID: 22396515
5. Spitzer M, Basaria S, Travison TG, Davda M, Mazer N, Knapp P, Collins L, Eder R, Davou P, Mohammed N, Bhasin S. Effect of testosterone on response to phosphodiesterase 5 inhibitor. Ann Intern Med 2012;157:681-91. PMID: 15271690
6. Bhasin S, Woodhouse L, Casaburi R, Singh AB, Mac R, Dzekov J, Dzekov C, Lee M, Yarasheski K, Sinha-Hikim I, Bhasin S. Older men are as responsive to the anabolic effects of testosterone as young men. J Clin Endocrinol Metab 2005;90:678-88. PMID: 15562020
7. Storer TW, Woodhouse LJ, Sattler F, Singh AB, Schroeder ET, Beck K, Padero M, Mac P, Yarasheski KE, Geurts P, Willemsen A, Harms MK, Bhasin S. A randomized, placebo-controlled trial of nandrolone decanoate in HIV-Infected men with mild to moderate weight loss with recombinant human growth hormone as active reference treatment. J Clin Endocrinol Metab 2005;90(8):4474-82. PMID: 15914526
8. Casaburi R, Bhasin S, Cosentino L, Porszasz J, Somfay A, Lewis MI, Fournier M, Storer TW. Effects of testosterone and resistance training in men with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 2004;170(8):870-8. PMID: 15271690
9. Basaria S, Harman SM, Travison TG, Hodis H, Tsitouras P, Budoff M, Pencina KM, Vita J, Dzekov C, Mazer NA, Coviello AD, Knapp PE, Hally K, Pinjic E, Yan M, Storer TW, **Bhasin S**. Effects of testosterone administration for 3 years on subclinical atherosclerosis progression in older men with low or low-normal testosterone levels. JAMA 2015;314(6):570-81. PMID: 26262795
10. Snyder PJ, Bhasin S, Cunningham GR, Matsumoto, AM, Stephens A, Swerdloff RS, Barrett-Connor E, Cauley J, Lewis B, Crandall J, Ensrud K, Basaria S, Storer TW, Mohler E, Ellenberg S. Effects of testosterone treatment on sexual function, mobility and vitality in older men: a randomized trial. N Engl J Med 2016; 374:611-624. PMID: 26886521

Manuscripts describing expertise in mechanism elucidation, target validation and discovery science as it relates to function promoting therapies:

11. Gonzalez-Cadavid NF, Taylor WE, Yarasheski K, Sinha-Hikim I, Ma K, Ezzat S, Shen R, Lalani R, Asa S, Mamita M, Nair G, Arver S, Bhasin S. Organization of the human myostatin gene and expression in healthy men and HIV-infected men with muscle wasting. Proc Natl Acad Sci USA 1998;95:14938-43. PMID: 9843994

12. Guo W, Bachman E, Li M, Roy CN, Blusztajn J, Wong S, Chan SY, Serra C, Jasuja R, Travison TG, Muckenthaler MU, Nemeth E, Bhasin S. Testosterone administration inhibits hepcidin transcription and is associated with increased iron incorporation into red blood cells. Aging Cell 2013;12:280-91. PMID 23399021
13. Jasuja R, Costello J, Singh R, Jang H, Serra C, Guo W, Collins JC, Bhasin S. Combined Administration of testosterone plus an ornithine decarboxylase inhibitor as a selective prostate-sparing anabolic therapy. Aging Cell 2013.doi: 10:1111/accel.12174 PMID: 18948405.
14. Basaria S, Bhasin S. Targeting the skeletal muscle-metabolism axis in prostate-cancer therapy. N Engl J Med 2012;367:965-7. PMID: 22931265

Expertise in Assessment of Muscle Performance and other Outcomes in Older Adults

Publications 1-4, 6-8, and 10 (above) and 15 below demonstrate our expertise in assessment of muscle performance and physical function.

15. LeBrasseur N, Bhasin S, Miciek R, Storer TW. The reliability of and differences in measures of muscle strength and physical function in young men, older men and older men with mobility limitations. J Am Geriatr Soc 2008;56:2118-23. PMID: 18811607

D. Research Support

Ongoing Research Support

1R01AG048326-01 Bhasin (PI)

Randomized Trial of a Multi-factorial Fall Injury Prevention Strategy

Source: NIA-PCORI

06/01/2014-5/30/2019

Specific Aims: This is an RCT of a individually-tailored, risk-factor based multi-factorial fall injury prevention strategy, including practice redesign and a multi-dimensional exercise intervention in 6000 older adults recruited at 10 trial sites.

Overlap: None

1R01AG037547-01 Bhasin (PI)

Optimizing Protein Intake in Older Americans with Mobility Limitations

Source: NIH-NIA

10/5/2010-9/30/2016

Specific Aim: To establish protein requirements for older Americans

Overlap: None

5U01AG030644-02 (Snyder, Peter, PI)

The Testosterone Trials (Boston Site PI: Bhasin, S)

Source: NIA; 07/1/2009-06/30/2016

Specific Aims: To determine the effects of testosterone on physical function, bone health, vitality, anemia, and sexual dysfunction in older men. Dr. Bhasin serves as the Leader of the Physical Function Trial as well as the PI for the Boston site.

1R43AG045011-A1 (Bhasin, PI of the Academic Partner BWH; Jasuja, PI of the FPT, LLC)

Novel algorithm for free testosterone determination

Source: NIA 09/30/2015-09/30/2016

Specific Aims: To elucidate the molecular mechanisms of testosterone to SHBG and develop an algorithm for estimating free testosterone from the binding model.

Bhasin, S (PI): An Investigator-Initiated Proof-of-Mechanism Study

Application of a kisspeptin analog to stimulate the hypothalamic-pituitary axis in older men

Source: Takeda Pharmaceuticals 07/01/2015 - 06/30/2017

Specific aims: To determine the effects of a kisspeptin analog in stimulating testosterone in older adults

Sarcopenia as a Biomarker of Risk of Mobility Disability (Bhasin, PI) (Bhasin, PI)

Source: NIA

9/30/2015 – 6/30/2017

Specific Aim: To establish evidence-based cutpoints for muscle mass and strength to define sarcopenia as a biomarker to identify older adults at risk for physical disability

Application of a Fall Detection Device in Community Dwelling Older Adults (Biosensics, LLC; Bhasin PI of BWH academic partner)

Source: SBIR / NIA

Period: 10/ 1/ 2015 – 9/30/2017

Specific aims: To determine the sensitivity and specificity of a fall detection device in older adults

1R01 DK070534-06 Bhasin (PI)

Mechanisms of Androgen Effects on Body Composition

NIDDK 08/1/04-9/30/2016

Specific aims: To determine how testosterone regulates myogenic differentiation of mesenchymal stem cells.

Relevant Completed Research Support

Effect of a Nonsteroidal SARM, LGD-4033, on Muscle Protein Dynamics

Source: Ligand Pharmaceuticals

Aims: The aims of this short term investigation were to determine whether a nonsteroidal SARM increases muscle protein synthesis in healthy men.

Overlap: none.

1R01DK72449 Bhasin (PI)

The Mechanism of Myostatin Action (Bhasin S, PI)

Source: NIDDK

Project period: 2/01/2009-1/31/14