

Curriculum Vitae
Daniel L. Smith, Jr., PhD

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A. EDUCATION

BS 1997 – Bob Jones University, Greenville, SC – Pre-Med
MS 2000 – Bob Jones University, Greenville, SC – Counseling
MS 2004 – University of Virginia, Charlottesville, VA – Biological and Physical Sciences
PhD 2007 – University of Virginia, Charlottesville, VA – Department of Biochemistry and Molecular Genetics
Postdoctoral 2007 – Department of Nutrition Sciences, University of Alabama at Birmingham
2011 – National Institute on Aging Summer Institute on Aging (25th Anniversary)

B. PROFESSIONAL EXPERIENCE

2012-present Assistant Professor – University of Alabama at Birmingham, Department of Nutrition Sciences
Member of the Comprehensive Center for Healthy Aging, Nutrition Obesity Research Center, Diabetes Research Center, Comprehensive Neuroscience Center
Research Focus: The interaction of diet and metabolism in relationship to aging and disease; obesity, calorie restriction, calorie restriction mimetics, brown adipose tissue, ulcerative dermatitis in C57BL/6 mice; and systems biology of aging using budding yeast chronological lifespan.

2010-2012 Faculty Instructor – University of Alabama at Birmingham, Department of Nutrition Sciences

C. PROFESSIONAL SOCIETIES

The Obesity Society (2008-present)
American Society for Nutrition (2010-present)
Gerontological Society of America (2010-present)

D. AWARDS & HONORS

1997 *summa cum laude*, BS, Bob Jones University, Greenville, SC
2001-2007 Dean's Fellow, University of Virginia, Charlottesville, VA
2002-2004 Cellular and Molecular Biology Training Grant Fellow, University of Virginia, Charlottesville, VA
2006 Award for Excellence in Scholarship in the Sciences & Engineering, University of Virginia, Charlottesville, VA
2008-2010 UAB Obesity Training Grant Fellow, University of Alabama at Birmingham, Birmingham, AL
2009 Fall Career Enhancement Award – The University of Alabama at Birmingham: Office of Postdoctoral Education
2009 Best Poster Award – The University of Alabama at Birmingham – Center for Aging Annual Meeting: "Metformin Supplementation and Lifespan in Fischer-344 Rats"
2010 First Place Award – University of Alabama at Birmingham, Postdoctoral Research Day
2012 UAB Center for Aging Annual Symposium Poster Winner – Junior Faculty Division
2014 New Energetics Ideas for the New Year, Nutrition Obesity Research Center and the Office of Energetics, Faculty – Most Creative Idea Award

E. ACADEMIC SERVICE

- 2010-present Faculty Affairs Committee, School of Health Professions, University of Alabama at Birmingham
- 2011 Nutrition & Obesity Workgroup (University Strategic Plan), University of Alabama at Birmingham
- 2011 Oxidative Stress and Mitochondria Workgroup (University Strategic Plan), University of Alabama at Birmingham
- 2013 Department of Nutrition Sciences – Graduate Admissions Committee
- 2013 Comprehensive Center for Healthy Aging Steering Committee, University of Alabama at Birmingham
- 2014 Associate Editor, *Frontiers in Nutrition Methodology*

F. REFEREE

JOURNAL Ad hoc

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|---|---|
| <i>Adipocyte</i> | <i>Experimental Gerontology</i> |
| <i>American Journal of Clinical Nutrition</i> | <i>Journal of the World Aquaculture Society</i> |
| <i>Annals of Internal Medicine</i> | <i>Obesity</i> |
| <i>Behavior Genetics</i> | <i>Physiology & Behavior</i> |
| <i>Current Pharmaceutical Design</i> | <i>Journal of Obesity</i> |
| <i>Diabetes Care</i> | <i>Journal of Lipid Research</i> |

Societies/Centers (Annual Meetings)

- Gerontological Society of America (2013)
- UAB Comprehensive Center for Healthy Aging (2012)

G. GRANT REVIEWS

- United Soybean Board, William J. Clinton Foundation (2009)

H. PUBLICATIONS

SCIENTIFIC JOURNALS (PEER REVIEWED):

1. Gallo CM*, **Smith Jr DL***, and Smith JS (2004) Nicotinamide clearance by Pnc1 directly regulates Sir2-mediated silencing and longevity. *Mol. Cell. Biol.* 24: 1301-1312. PMID: PMC321434
2. Weinberger M, Feng L, Paul A, **Smith Jr DL**, Hontz RD, Smith JS, Vujcic M, Singh K, Huberman JA, and Burhans WC (2007) DNA replication stress is a determinant of chronological lifespan in budding yeast. *PLoS ONE* 2(8): e748. PMID: PMC1939877
3. **Smith Jr DL**, McClure JM, Matecic M, and Smith JS (2007) Calorie restriction extends the chronological life span of *Saccharomyces cerevisiae* independently of the Sirtuins. *Aging Cell* 6 (5), 649-662.
4. McClure JM, Gallo CM, **Smith Jr DL**, Matecic M, Hontz RD, Buck SW, Racette FG, Smith JS. (2008) Pnc1p-mediated nicotinamide clearance modifies the epigenetic properties of rDNA silencing in *Saccharomyces cerevisiae*. *Genetics* 180(2):797-810. PMID: PMC2567381
5. **Smith Jr DL**, Johnson MS and Nagy TR. (2009) Precision and accuracy of bioimpedance spectroscopy for determination of *in vivo* body composition in rats. *International Journal of Body Composition Research* 7(2): 21-26. PMID: PMC2722071
6. Johnson MS, **Smith Jr DL** and Nagy TR. (2009) Validation of quantitative magnetic resonance (QMR) for determination of body composition in rats. *International Journal of Body Composition Research* 7(3): 99-108. PMID: PMC2914623
7. **Smith DL Jr**, Li C, Matecic M, Maqani N, Bryk M, Smith JS. (2009) Calorie restriction effects on silencing and recombination at the yeast rDNA. *Aging Cell* 8(6):633-42. NIHMSID: NIHMS143548
8. Li X, Cope MB, Johnson MS, **Smith Jr DL**, Nagy TR. (2010) Mild calorie restriction induces fat accumulation in female C57BL/6J mice. *Obesity* 18(3):456-62. PMID: PMC2880162

9. Minor RK, **Smith DL Jr**, Sossong AM, Kaushik S, Poosala S, Spangler EL, Roth GS, Lane M, Allison DB, de Cabo R, Ingram DK, Mattison JA. (2010) Chronic ingestion of 2-deoxy-D-glucose induces cardiac vacuolization and increases mortality in rats. *Toxicol Appl Pharmacol* 243(3):332-9. PMID: PMC2830378
10. **Smith DL Jr**, Nagy TR, Wilson LS, Dong S, Barnes S, Allison DB. (2010) The effect of mannan oligosaccharide supplementation on body weight gain and fat accrual in C57Bl/6J mice. *Obesity* 18(5):995-9. PMID: PMC2940117
11. **Smith Jr DL**, Elam Jr C, Mattison JA, Lane MA, Roth GS, Ingram DK, and Allison DB. (2010) Metformin supplementation and lifespan in Fischer-344 rats. *Journals of Gerontology Series A: Biological Sciences* 65(5):468-74. PMID: PMC2854888
12. Matecic M, **Smith DL**, Pan X, Maqani N, Bekiranov S, Boeke JD, and Smith JS. (2010) A Microarray-based genetic screen in yeast for chronological aging factors. *PLoS Genetics* 6(4):e1000921. PMID: PMC2858703
13. Hu HH*, **Smith DL Jr***, Nayak KS, Goran MI, and Nagy TR. (2010) Identification of brown adipose tissue in mice with fat-water IDEAL-MRI. *Journal of Magn Reson Imaging* 31(5):1195-202. PMID: PMC2924147
14. Robertson HT, **Smith DL**, Pajewski NM, Weindruch RH, Garland T Jr, Argypoulos G, Bokov A and Allison DB. (2011) Can rodent longevity studies be both short and powerful? *J Gerontol A Biol Sci Med Sci.* 66(3):279-86. PMID: PMC3041472
15. **Smith DL Jr**, Robertson HT, Desmond RA, Nagy TR and Allison DB. (2010) No compelling evidence that sibutramine prolongs life in rodents despite providing a dose-dependent reduction in body weight. *Int J Obes (Lond).* 35(5): 652-7. PMID: PMC3091992
16. **Smith DL Jr**, Mattison JA, Desmond RA, Gardner JP, Kimura M, Roth GS, Ingram DK, Allison DB, Aviv A. (2011) Telomere dynamics in Rhesus Monkeys: No Apparent Effect of Caloric Restriction. *J Gerontol A Biol Sci Med Sci.* 66(11): 1163-8. PMID: PMC3193524
17. Hamilton G, **Smith DL Jr**, Bydder M, Nayak KS and Hu HH. MR properties of brown and white adipose tissues. (2011) *Journal of Magn Reson Imaging* 34(2): 468-73. PMID: PMC3146031
18. Hu HH, Hines CD, **Smith DL Jr**, Reeder SB. Variations in T(2)* and fat content of murine brown and white adipose tissues by chemical-shift MRI. (2012) *Magn Reson Imaging* 30(3): 323-9. PMID: PMC3288644
19. Casazza K, Fontaine KR, Astrup A, Birch LL, Brown AW, Bohan Brown MM, Durant N, Dutton G, Foster EM, Heymsfield SB, Mclver K, Mehta T, Menachemi N, Newby PK, Pate R, Rolls BJ, Sen B, **Smith JR DL**, Thomas DM and Allison DB. Myths, Presumptions, and Facts about Obesity. (2013) *N Engl J Med.* 31;368(5):446-54. PMID: PMC3606061
20. Yang Y, **DL Smith Jr.**, HH Hu, G Zhai, and TR Nagy. Chemical-shift water-fat MRI of white adipose depots: Inability to resolve cell size differences. *Int J Body Composition Res,* (2013) 11(1);9-16 PMID: PMC3649013
21. Li XS, Johnson MS, **Smith Jr DL**, Li Y, Kesterson RA, Allison DB, and Nagy TR. Effects of risperidone on energy balance in female C57BL/6J mice. *Obesity* (2013) [Epub ahead of print]. PMID: PMC3657586
22. **Smith, Jr DL**, Yang Y, Hu HH, Zhai G, and Nagy TR. Measurement of Interscapular Brown Adipose Tissue of Mice in Differentially Housed Temperatures by Chemical-Shift-Encoded Water-Fat MRI. *JMRI* (2013) [Epub ahead of print] PMID: PMC3856180
23. **Smith DL Jr**, Barry RJ, Powell ML, Nagy TR, D'Abramo LR, Watts SA. Dietary Protein Source Influence on Body Size and Composition in Growing Zebrafish (2013) [Epub ahead of print] PMID: PMC3760061
24. Froehlich, JM, Fowler, ZG, Galt, NJ, **Smith Jr, DL**, Biga, PR. Sarcopenia and piscines: the case for indeterminate-growing fish as unique genetic model organisms in aging and longevity research. *Front Genet* (2013) PMID: PMC3743216
25. Harrison, DE, Strong, R, Allison, DB, Ames, BN, Astle, CM, Atamna, H, Fernandez, E, Flurkey, K, Javors, MA, Nadon, NL, Nelson, JF, Pletcher, S, Simpkins, **Smith, DL**, Wilkinson, JE, Miller, RA. Acarbose, 17- α -estradiol, and nordihydroguaiaretic acid extend mouse lifespan preferentially in males. *Aging Cell* (2013) Oct 26 [Epub ahead of print] PMID: in process

*Authors contributed equally to this work

BOOK CHAPTERS AND REVIEWS

1. **Smith Jr DL** and Smith JS. Sirtuin Function in Longevity. In: *The Comparative Biology of Aging: An inter-species review of aging changes and their mechanisms*. N.S. Wolf, ed., Springer Publishers, Inc., 2010
2. **Smith Jr DL**, Nagy TR, and Allison DB. (2010) Calorie Restriction: What Recent Results Suggest for the Future of Aging Research. *Eur J of Clin Invest* 40(5):440-50 PMID: PMC3073505
3. Moellering DR and **Smith DL**. Ambient Temperature and Obesity. (2012) In "Etiology of Obesity" *Curr Obes Rep* 1(1): 26-34. PMID: *In process*
4. Kaiser KA, **Smith Jr DL** and Allison DB Conjectures on some curious connections among social status, calorie restriction, hunger, fatness, and longevity. (2012) *Ann NY Acad Sci* 1264(1):1-12 PMID: PMC3464393

<http://www.healio.com/endocrinology/news/print/endocrine-today/%7B7f1371f0-7fcc-49cd-8ba1-4e4debecb2a9%7D/exploring-brown-fat-the-long-road-ahead>

I. PRESENTATIONS

TEACHING

2012 – Summer Term Co-Course Master (with Dr. Maria Johnson); Body Composition & Energy Expenditure (NTR650/750) Department of Nutrition Sciences, UAB

Guest Lectures

2008 Brown Adipose Tissue; Body Composition & Energy Expenditure Summer Course (Course Master: Dr. Tim Nagy)
2010 How Do We Define and Measure Obesity in Animal and Human Models; Obesity in the 21st Century (Course Master: Dr. Jose Fernandez)
2011, 2012, 2013 Human Body Composition Methodologies; The Molecular & Genetic Basis of Obesity (Course Master: Dr. Molly Bray)
2011, 2013 Measures of Brown Adipose Tissue by IDEAL MRI; Energy Metabolism, Diabetes & Obesity Journal Club (Course Master: Dr. Krista Casazza)
2012 Center for Aging Community Advisory Committee (University of Alabama at Birmingham)

Invited Presentations

2010 Genetics and Genomics Seminar Series – Genetic Pathways Affecting Lifespan (Yeast)
2011 Nutrition Obesity Research Centers Directors Meeting – "Nutrition and Cellular Aging with Budding Yeast"
2013 Professional Workshop Series: Creativity in Research (Pt 1) – UAB School of Public Health and the Nutrition Obesity Research Center.
2013 AALAS National Meeting Seminars, "Mouse Ulcerative Dermatitis – Perspective on a Persistent Problem"
2013 Gerontological Society of American Annual Meeting, Nutrition Interest Group, "Nutrition, Energetics & Aging: Model Organisms at the University of Alabama at Birmingham"

J. RESEARCH FUNDING

CURRENT FUNDING

Body Composition, Energetics, and Longevity

PI: David B. Allison, PhD (Co-Investigator)

Type: 1R01AG033682

Direct Costs: \$271,578 (Current Yr)

Investigation of the effects of calorie restriction (for weight loss) and weight cycling (yo-yo dieting) on body composition, metabolism, longevity and disease patterns after the establishment of obesity in a rodent model.

Agency: NIH/NIA

Period: 3/01/2010 – 02/28/2015

Effort: 3.0 calendar months

Preservation of glucose homeostasis with acarbose for lifespan extension. Acarbose as a calorie restriction mimetic.

PI: Daniel L. Smith, Jr., PhD

Agency: The Ellison Medical Foundation

Type: New Scholar in Aging

Period: 08/01/2012 – 07/31/2016

Direct Costs: \$92,593 (yearly)

Effort: 1.8 cal mo

Promoting “healthy aging” requires a deeper understanding of the role of nutrients in disease and longevity. This work tests whether acarbose, a glucosidase inhibitor that reduces and delays complex carbohydrate digestion and absorption, is a calorie restriction mimetic considering its ability to lower post-prandial and plasma glucose.

Constructing Gene-Regulatory Networks to Reveal the Metabolic Basis of Lifespan in Yeast

PI: John H. Hartman, MD (Co-Investigator)

Agency: NIH/NIA

Type: R01

Period: 07/15/2012 – 06/30/2017

Direct Costs: \$250,000 (Current Yr)

Effort: 2.4 calendar months

This is an application in response to RFA RFA-AG-12-011: Demonstration Projects for Systems Biology of Aging in *Saccharomyces cerevisiae* (R01). The goal is to integrate phenomic analysis in yeast with metabolomics and network construction methods to achieve systems level understanding of cellular aging.

Energetics, Disparities, & Lifespan: A unified hypothesis

PI: Allison (Co-Investigator)

Agency: NIH

Type: TR01 (AG043972)

Period: 09/01/2012 - 8/31/2017

Direct costs: \$2,059,391.00 (1st Yr)

Effort: 3.6 cal mo

Maximizing quality of life for citizens from all social strata and at all ages requires an understanding of the factors that lead to disparities in health, to differences in body fat levels, and to healthier aging in our increasingly older population. The proposed research will contribute such knowledge.

OTHER ACTIVE AWARDS

Acarbose

Co-PIs: Allison & Smith

Agency: NIA

Type: Interventions Testing Program

Period: 2009-present

Direct Costs: NA

Effort: NA

Acarbose is currently being tested at the NIA ITP program for health promotion and lifespan extension in mice under *ad lib* feeding conditions (cohort 2009). Additional follow-up studies are underway at the NIA and are complementary to the proposed studies in the Ellison Medical Foundation Grant.

(<http://www.nia.nih.gov/research/dab/interventions-testing-program-itp/compounds-testing>)

COMPLETED FUNDING

Reduced Ambient Temperature as a Confounding Agent in Obesity Drug Discovery

PI: Daniel L. Smith, Jr., PhD

Agency: The Obesity Society

Type: Early-Career Research Grant

Period: 11/15/2011-11/14/2012

Direct Costs: \$25,000 (Current Yr)

Effort: 0.6 calendar months

Testing the effects of thermoneutral housing compared with normal, laboratory room temperature for food intake, body weight and body composition effects of weight loss medications in mice as a pre-clinical model of human metabolism for translation research.

Diet and husbandry optimized for growth and reproduction in zebrafish (*D. rerio*) as a predictor of reduced health and longevity

PI: Daniel L. Smith, Jr., PhD

Agency: NIDDK

Type: Pilot grant from P30DK056336

Period: 6/1/2010-5/30/2012

Investigation of the effect of the protein source and amount on growth, body composition and reproduction in zebrafish using a semi-purified diet. Additional studies of temperature effects on growth and body composition.

In vivo determination of brown adipose tissue and adipocyte cell size using MRI

PI: Tim R. Nagy, PhD (Co-Investigator)

Agency: NIDDK

Type: Pilot grant from P60DK079626

Period: 2/22/2010-2/21/2012

Validation and determination of the feasibility of IDEAL magnetic resonance imaging for the measurement of fat cell size and brown adipose tissue amount using the fat fraction metric.

Validation of the ImpediVet™ device for the determination of body composition in rats and mice

PI: Tim R. Nagy, PhD

Agency: ImpediMed™

Type: Industry

Period: 1/1/08 – 12/31/08

Validation study of the ImpediVet™ device for the determination of body composition in rats and mice.

Effects of Mannan on Body Weight & Body Composition: A Precursor to a Longevity Study

PI: David B. Allison, PhD

Agency: ODS

Type: Pilot grant from P50AT00477

Period: 12/1/07 – 12/1/08

Investigation of manno oligosaccharide supplementation as a potential calorie restriction mimetic.