

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Allison, David B.

eRA COMMONS USER NAME (credential, e.g., agency login): Dallison1

POSITION TITLE: Distinguished Professor; Quetelet Endowed Professor of Public Health; Associate Dean for Science; Director, Office of Energetics; Director, Nutrition Obesity Research Center

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
Vassar College, Poughkeepsie, New York	B.A.	05/1985	Psychology
Hofstra University, Hempstead, New York	M.A.	08/1987	Clinical Psychology
Hofstra University, Hempstead, New York	Ph.D.	07/1990	Clinical Psychology
Johns Hopkins University School of Medicine	Post-doc	08/1991	Behavioral Pediatrics
Columbia University & Saint Luke's/Roosevelt Hospital, New York	Post-doc	05/1994	Obesity

A. Personal Statement

I am excited about working on this proposed project involving expectancy effects. Conceived from a dialogue I had with my collaborator of two decades, Dr. Kevin Fontaine, and our team's more recent addition Dr. Gareth Dutton, this project is quite distinct from any we know of being studied by other investigators. It approaches weight loss RCTs from a different angle and asks an important, yet heretofore unaddressed, question.

Originally trained as a psychologist, I have studied obesity for over 20 years, and gone on to develop advanced expertise in statistical science—becoming a professor of biostatistics and an elected Fellow of the American Statistical Association—, in genetic epidemiology, in aging research, and in nutrition research. My research interests include obesity, energetics, quantitative genetics, clinical trials, and statistical and research methodology. In recent years, my work has involved several major areas: (a) the relations among body weight, body composition, caloric intake, and changes thereof with longevity in animal models and humans; (b) the genetic, behavioral, and environmental influences on obesity and related traits; (c) statistical methods for genetic and epidemiologic studies; (d) design, implementation, and analysis of randomized controlled trials; and (e) research integrity. In addition, attesting to my organizational abilities, I have served as principal investigator or co-principal investigator for 5 successful NIH R13-funded conferences, edited 5 books, initiated 4 successful NIH-funded T32 training programs as a principal investigator, and served as the director of several NIH- and NSF-funded national short courses on statistical genetics. I am currently funded to offer 2 national short courses on obesity via NIH R25 grants (R25DK099080 “Mathematical Sciences in Obesity Research” www.soph.uab.edu/energetics/shortcourse/; and R25HL124208 “Strengthening Causal Inference in Behavioral Obesity Research” www.soph.uab.edu/energetics/causal_inference_shortcourse/). I am also deeply committed to mentoring new scholars in our field, attested through multiple mentoring awards, having successfully mentored dozens of early career faculty, post-doctoral fellows, and graduate students who have now gone on to be successful independent scientists and faculty.

I have published over 500 papers in peer-reviewed journals. A complete listing can be found in my full CV at: http://www.soph.uab.edu/files/faculty_cvs/DAllisonCV_17.pdf

- Casazza K, **Allison DB**. 2012. Stagnation in the clinical, community, and public health domain of obesity: the need for probative research. *Clinical Obesity* 2:83–85. PMID: 25586161. No NIH Support.

- Pavela G, Wiener H, Fontaine KR, Fields DA, Voss JD, **Allison DB**. (In press). Packet randomized experiments for eliminating classes of confounders. *European Journal of Clinical Investigation* [Epub ahead of print, Dec 1, 2014]. DOI: 10.1111/eci.12378. PMID: 25444088. PMCID Journal – In Process

B. Positions and Selected Honors

Academic Employment

- 1991–1994 Post-Doctoral Fellowship, New York Obesity Research Center, St. Luke's/Roosevelt Hospital, Columbia University College of Physicians and Surgeons
- 1994–2001 Associate Research Scientist, NY Obesity Research Center, Saint Luke's/Roosevelt Hospital Center
- 1994–1999 Assistant Professor of Clinical Psychology (in Psychiatry), Columbia University College of Physicians and Surgeons
- 1999–2001 Associate Professor of Medical Psychology (in Psychiatry), Columbia University College of Physicians and Surgeons
- 2001–2011 Head and founder, Section on Statistical Genetics, University of Alabama at Birmingham
- 2001–Present Professor (with tenure) of Biostatistics & Director, Nutrition Obesity Research Center, Dept. of Nutrition Sciences, University of Alabama at Birmingham
- 2011 Appointed Distinguished Professor by the Board of Trustees of University of Alabama at Birmingham
- 2012 Appointed Quetelet Endowed Professor of Public Health by the Board of Trustees of University of Alabama at Birmingham

Memberships, Honors, and Awards (selected from > 50)

- 2014 Elected Chair-Elect of the American Society of Nutrition (ASN) Obesity Research Interest Section (RIS)
- 2014 Elected Fellow of the Gerontological Society of America
- 2014 Elected Fellow of the New York Academy of Medicine
- 2014 Atwater Award from the United States Department of Agriculture
- 2013 Selected Member of the National Public Health Honor Society, Delta Omega
- 2013 Wright Gardner Award from the Alabama Academy of Science, to honor individuals whose research work during residence in Alabama has been outstanding
- 2013 Elected Member of the Johns Hopkins Society of Scholars
- 2013 American Society of Nutrition's 2013 Dannon Institute Mentorship Award
- 2013 University of Alabama at Birmingham Graduate Dean's Excellence in Mentorship Award
- 2012 ***Elected Member of the Institute of Medicine (IOM) of the National Academies***
- 2012 Appointed Quetelet Endowed Professor of Public Health by the Board of Trustees of University of Alabama at Birmingham
- 2011 Appointed Distinguished Professor by the Board of Trustees of University of Alabama at Birmingham. Dr. Allison was on the 21st person in the history of UAB to be awarded this honor.
- 2011 Selected as the 2011 Distinguished Faculty Lecturer by University of Alabama at Birmingham. Recognizing faculty who have advanced the frontiers of science, this has been called the highest award a UAB faculty member can receive.
- 2009 Elected Fellow of the American Association for the Advancement of Science (AAAS)
- 2009 TOPS Research Achievement Award from the Obesity Society. Recognizes an individual for singular achievement or contribution to obesity research.
- 2009 American Society of Nutrition's Centrum Center for Nutrition Science Award. Given in recognition of recent investigative contributions of significance to the basic understanding of human nutrition.
- 2006 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM). Administered by the National Science Foundation, the award was accompanied by a Presidential certificate and a personal visit with the President in the Oval Office.
- 2002 Andre Mayer Award from the International Association for the Study of Obesity (IASO). International award given once every four years for outstanding achievement by an investigator under age 40.
- 2002 Lilly Scientific Achievement Award from the North American Association for the Study of Obesity for outstanding achievement by an investigator within 15 years of receiving their doctoral degree.

- 1999 Award for Outstanding Achievement in Health Psychology from the Health Psychology Division of the American Psychological Association
- 1996 Neal Miller Early Career Award from the Academy of Behavioral Medicine

C. Contributions to Science

Opening up new ideas: Science thrives when we constantly challenge ourselves to consider new ideas and new approaches to research. Much of my work has involved introducing new ideas in the field of obesity. Many of these have then served as catalysts for the field, as well as for individuals working directly with me, to follow up with research addressing the hypotheses introduced, questions raised, or new methodologic approaches suggested. As one recent example, to find ways to increase the efficiency with which meta-researchers can assess large bodies of scientific literature, in collaboration with my mentee Dr. AW Brown, I developed and tested crowdsourcing as a novel approach. The method proved to be reliable and cost effective, opening an avenue to timely and economic meta-analyses of current research. Two provocative concept articles on putative contributors to the obesity epidemic in the United States beyond those conventionally discussed emphasize my role as an advocate of openness to new ideas and have spurred multiple hypothesis-testing investigations around the world. Another influential area of my research, currently funded through a **Transformative R01 grant**, addresses the theory that perceptions about energetic uncertainty influence adiposity and lifespan (as tested in mice and flies).

- Brown A, **Allison DB**. 2014. Using crowdsourcing to evaluate published scientific literature: methods and example. *PLoS One* 9:e100647. DOI: 10.1371/journal.pone.0100647. PMID: PMC4079692.
- Keith S, ... [20 authors in total], **Allison DB**. 2006. Putative contributors to the secular increase in obesity: exploring the roads less traveled. *International Journal of Obesity* 30:1585–1594. PMID: 16801930.
- McAllister EJ, ... [22 authors in total], **Allison DB**. 2009. Ten putative contributors to the obesity epidemic. *Critical Reviews in Food Science and Nutrition* 49:868–913. PMID: PMC2932668.
- Schwartz TS, Gainer R, Dohm ED, Johnson MS, Wyss JM, **Allison DB**. 2015. Second-hand eating? Maternal perception of the food environment affects reproductive investment in mice. *Obesity* (in press).

Methods development: Advances in research depend vitally on good methods, and just as the content of science evolves, so too must the methods. I have published extensively on the development of methods for experimental design and data analysis. For example, in 2002, shortly after large-scale, high-dimensional genomics (microarrays) entered the field, my team introduced the first statistical method for analyzing the distribution of P-values, an approach which then spawned many extensions and similar approaches by others. My group has helped the field push for more rigor in ‘omics’ analysis. In the area of epidemiology, we introduced more efficient analyses to determine years of life lost. We have developed and introduced new methods for testing effects on ‘maximum lifespan’ which are now used by the National Institute on Aging as standard procedure in their *Interventions Testing Program*. Most recently, we have introduced a method to test for causal effects of human fetal genotype on the phenotype of the mother (the fetal drive hypothesis).

- **Allison DB**, et al. [7 authors in total]. 2002. A mixture model approach for the analysis of microarray gene expression data. *Computational Statistics & Data Analysis* 39:1–20.
- Mehta T, Tanik M, **Allison DB**. 2004. Toward sound epistemological foundations of statistical methods for high dimensional biology. *Nature Genetics* 36:943–947. PMID: 15340433.
- Gao G, Wan W, Zhang S, Redden DT, **Allison DB**. 2008. Testing for differences in distribution tails to test for differences in ‘maximum’ lifespan. *BMC Medical Research Methodology* 8:49. PMID: PMC2529340.
- Liu N, Archer E, Srinivasasainagendra V, **Allison DB**. 2015. A statistical framework for testing fetal drive effects: illustration in a human dataset. *Frontiers in Genetics* 5:464. PMID: Journal – In Process

Dispelling misinformation (i.e., ‘myth busting’): In the field of obesity and nutrition research, ideas and beliefs that would, if challenged, not withstand scientific questioning are often perpetuated. Since the earliest days of my career, beginning with a 1993 JAMA paper showing mislabeling of calories in marketed foods, I have published numerous papers that effectively ‘busted myths’ and corrected misinformation regarding obesity. I have done this through systematic reviews, original empirical data collection, meta-analyses, hypothesis-driven experiments, and methods development. A recent, much-cited and widely-discussed example includes our studies regarding the presumed effects of regular breakfast consumption (as opposed to breakfast-skipping) on preventing or reducing obesity. My mentees and I showed how the existing observational evidence in the field had been exaggerated, and we conducted a large multi-site RCT to test the effect and found none. In this and other analyses, my colleagues and I proved how scientific reporting often is distorted by biased research reporting and research lacking probative value. My role in these types of critical

evidence evaluation has been a key factor in both my election to the Institute of Medicine and my selection for the USDA/ASN's Atwater Award.

- **Allison DB**, Heshka S, Sepulveda D, Heymsfield SB. 1993. Counting calories? – Caveat emptor. *Journal of the American Medical Association* 270:1454–1456. PMID: 8371446.
- Brown AW, Bohan Brown MM, **Allison DB**. 2013. Belief beyond evidence: using the proposed effect of breakfast on obesity to show 2 practices that distort scientific evidence. *American Journal of Clinical Nutrition* 98:1298–1308. PMCID: PMC3798081.
- Dhurandhar EJ, ... [13 authors in total], **Allison DB**. 2014. The effectiveness of breakfast recommendations on weight loss: a randomized controlled trial. *American Journal of Clinical Nutrition* 100:507–513. PMCID PMC4095657.
- Casazza K, ... [20 authors in total], **Allison DB**. 2013. Myths, presumptions, and facts about obesity. *New England Journal of Medicine* 368:446–454. DOI: 10.1056/NEJMsa1208051. PMCID PMC3606061

Leading large collaborative projects: I enjoy organizational activities, and as a senior scientist as well as director of the NIH-funded Nutrition Obesity Research Center, I am well-positioned and often have the opportunity to offer leadership to large research teams advancing medical science in nutrition, obesity, and disease prevention. The following are just a few of many publications (as first or senior author) attesting to my leadership role in large collaborative efforts. Topics, to name just a few, include the identification of research priorities and opportunities in the domain of aging and energetics; RCTs of pharmaceuticals that led to FDA approval of a clinically useful drug; a novel pooling analysis showing that many mammalian populations living with or around humans are also experiencing epidemics of weight gain; and the exposition that self-reported energy intake and physical activity energy expenditure are unreasonably poor measures for use in scientific research.

- **Allison DB**, et al. [9 authors and many sites in total]. 2012. Controlled-release phentermine/topiramate in severely obese adults: a randomized controlled trial (EQUIP). *Obesity* 20:330–342. PMCID: PMC3270297.
- **Allison DB**, et al. [25 authors in total]. 2014. Aging and energetics' "Top 40" future research opportunities 2010–2013. [v1; ref status: indexed, <http://f1000r.es/4ae>]. *F1000Research* 3:219. DOI: 10.12688/f1000research.5212.1. PMCID: PMC4197746.
- Klimentidis YC, ... [12 authors in total], **Allison DB**. 2010. Canaries in the coal mine: a cross-species analysis of the plurality of obesity epidemics. *Proceedings of the Royal Society B: Biological Sciences* 278:1626–1632. DOI: 10.1098/rspb.2010.1890. PMCID: PMC3081766.
- Dhurandhar NV, ... [9 authors in total], **Allison DB**, & the Energy Balance Measurement Working Group. 2014. Energy balance measurement: when something is not better than nothing. *International Journal of Obesity* [Epub ahead of print, Nov 13]. DOI: 10.1038/ijo.2014.199. PMID: 25394308. PMCID Journal – In Process

Research integrity: One of the most important values I strive to convey to my mentees is research integrity, because I am deeply committed to ethical principles such as intellectual honesty, trustworthiness, and the personal responsibility to conduct science to the highest possible professional standards. I have a long track record as an advocate for clear, transparent reporting of research results, and I openly write on controversial topics that relate to biostatistics (e.g., so-called P-hacking, misuse of odds ratios) and medical claims and recommendations (e.g., lack of evidential basis for most dietary supplements).

- Cope MB, **Allison DB**. 2010. White hat bias: examples of its presence in obesity research and a call for renewed commitment to faithfulness in research reporting. *International Journal of Obesity* 34:84–88; discussion 83. PMCID: PMC2815336.
- Gadbury GL, **Allison DB**. 2012. Inappropriate fiddling with statistical analyses to obtain a desirable P-value: tests to detect its presence in published literature. *PLoS One* 7:e46363. DOI: 10.1371/journal.pone.0046363. PMCID: PMC3466248.
- Tajeu GS, Sen B, **Allison DB**, Menachemi N. 2012. Misuse of odds ratios in obesity literature: an empirical analysis of published studies. *Obesity* 20:1726–1731. PMCID: PMC3399983.
- Kaiser KA, ... [13 authors in total], **Allison DB**. 2012. Is funding source related to study reporting quality in obesity or nutrition randomized control trials (RCTs) in top tier medical journals? *International Journal of Obesity* 36:977–981. PMCID: PMC3288675.

D. Research Support

In the past three years, I have held grants for work in areas such as: (a) the relations among body weight, body composition, caloric intake, and changes thereof with longevity in animal models and humans; (b) genetic,

behavioral, and environmental influences on obesity-related traits; (c) statistical methods; and (d) clinical trials of weight loss. Selected supporting grants are summarized below.

(a) Relations among body weight, body composition, caloric intake, and longevity

NIH R01AG043972 (Allison) 09/15/12 – 08/31/17

Energetics, Disparities, & Lifespan: A Unified Hypothesis

This **Transformative R01** research involves conducting seven separate experiments in model organisms to test a theory that perceptions about the energetic security of the environment influence both organisms' tendency to store energy as body fat and the fundamental rate of aging or senescence.

NIH P30DK056336 (Allison) 06/01/00 – 06/30/17

UAB Nutrition Obesity Research Center

This research center supports all aspects of research on nutrition with an emphasis on obesity.

NIH R01 R01AG033682 (Allison) 02/15/10 – 02/14/15

Body Composition, Energetics, and Longevity

Examine the effects of repeated weight loss and regain on longevity in mice.

(b) Genetic, behavioral, and environmental influences on obesity and related traits

NSF IOS 1051890 (Morgan/Hahn) 04/01/11 – 03/31/14

Integrating Physiological and Genetic Mechanisms to Understand the Evolution of Cold Tolerance

Test hypotheses about biochemical and physiological mechanisms underlying the evolution of cold tolerance.

NIH R01DK52431 (Leibel/Allison/Chung – multiple PI) 08/01/03 – 11/30/13

Molecular Genetic Analysis of Human Obesity

Evaluate the association of obesity candidate genes with obesity phenotypes.

NIH R01DK074842-01A1 (Boyer) 09/13/07 – 08/31/13

Genetics of Obesity in Yup'ik Eskimos

Conduct linkage genome scan & exhaustive gene-based candidate gene association study related to obesity.

(c) Methodology

NIH R01GM099992 (de los Campos) 09/01/12 – 06/30/17

Factors Affecting Prediction Accuracy of Complex Human Traits and Diseases

Produce a comprehensive evaluation of Whole Genome Prediction methods.

NIH R25 HL124208 (Allison) 08/15/14 – 06/30/18

Strengthening Causal Inference in Behavioral Obesity Research

National short course funded by the National Heart Lung and Blood Institute.

NIH R25DK099080 (Allison/Thomas) 07/01/13 – 06/30/18

The Mathematical Sciences in Obesity Research

The course develops connections between mathematical scientists and obesity researchers for novel research.

(d) Clinical trials

NIH R01DK078826 (Allison) 03/01/09 – 02/28/13

Design Issues in Obesity RCTs: Building an Evidence Base

Use meta-analytic and raw data pooling methods to evaluate merits of various design features in obesity RCTs.

Jason Pharmaceuticals (Allison) 09/14/10 – 09/13/12

Randomized Clinical Trial of the Medifast 5&1 Plan

Conduct a randomized controlled trial of a weight loss program.