David A. McDonald, Ph.D.

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Education

Ph.D., Genetics & Genomics *May 2013*
Duke University, Durham, NC
Dissertation title: Cerebral Cavernous Malformations – From Two-Hit Mechanism to Developing a Targeted Therapy. Advisor: Dr. Douglas A. Marchuk
Certificate in College Teaching
Certificate in Cell & Molecular Biology

B.S., Biochemistry *May 2008*
University of Florida, Gainesville, FL
Thesis title: Effects of Chemical Diabetes, Starvation, and Endocrine Hormones on Blood and Organ Carnitine Concentrations in Rats. Advisor: Dr. Peggy R. Borum
Summa cum laude

Higher Education Experience

Associate Director, Graduate Student Career Services, Duke University, Durham, NC *October 2017 – Present*
- Managing a team of four (three direct reports) to provide career services to Master's and Doctoral students from humanities, social science, and STEM disciplines
- Created an assessment strategic plan for the Career Center to create a culture of evidence-based decision-making
- Developing and maintaining relationships with on-campus stakeholders to meet the needs of graduate students
- Spearheading the transition to a new technology platform through coordinating with stakeholders, managing multiple timelines, and organizing training sessions
- Advocated for and led the formation of a Diversity Committee, focusing initially on creating an open and accepting staff culture and developing strategic relationships with offices and identity centers across campus
- Leading a shift in graduate student career education through needs assessment (interviews with faculty and students, organizing design charrettes with stakeholders) and the creation of the Duke Grad Milestones for integration into graduate program curricula
- Reviewed the Duke Sanford School's career services model as part of a collaborative committee, contributing to benchmarking with peer public policy schools and soliciting student feedback
- Published career-related articles on Inside Higher Ed with posts exceeding 6,500 page views

Education Researcher, Freelance *September 2014 – Present*
- Analyzing quantitative and qualitative survey data on medical education

Assistant Director, Graduate Student Career Services, Duke University, Durham, NC *January 2015 – September 2017*
- Led the Career Center in the development and implementation of assessment projects, fostering a culture of assessment and using data to inform decision-making

- Trained Career Center staff in educational best practices, developing sustained interest in improving how learning outcomes are created and assessed
- Headed committees to hire Career Center staff and ensure that facilities and resources are attuned to the needs of students with disabilities
- Hired and supervised an intern to research career outcomes of Master's students
- Spearheaded a team to develop workshop curricula incorporating novel opportunities for graduate students
- Created rapport with faculty to encourage cultural change in the perception of graduate students pursuing non-academic careers
- Coordinated event series and online resources with The Graduate School and the Office of Postdoctoral Services
- Built and sustained relationships with on-campus partners to serve graduate student career needs particular to each degree program
- Fostered connections between students, alumni, and professionals from various industries
- Developed new resources and programs to guide students through exploring possible career paths and conducting successful job and internship searches
- Published career-related articles on Inside Higher Ed

Co-Founder, Postdoc Association, North Carolina Central University, Durham, NC — *December 2013 – January 2015*

- Directed the formation of the university's first postdoctoral association by interfacing with university administration and coordinating with postdoctoral fellows across campus
- Invited professionals to speak to postdocs on career paths in and outside of academia

Instructor, North Carolina Central University, Durham, NC — *August 2013 – January 2015*

- Supervised and trained teaching assistants
- Created a curriculum to improve students' scientific skills by incorporating authentic research experiences
- Presented findings from educational research at national conferences

Instructor, Duke University Talent Identification Program, Winston-Salem, NC — *July 2013*

- Utilized active learning, team-based learning, and project-based learning techniques to teach middle school students how to use scientific principles

Teaching Assistant, Duke University, Durham, NC — *Fall 2012*

- Piloted a new course with a team of educators incorporating active learning methods

Research Experience

HHMI Postdoctoral Fellow, North Carolina Central University, Durham, NC — *August 2013 – January 2015*

Graduate Researcher, Duke University, Durham, NC — *August 2008 – June 2013*

Undergraduate Researcher, University of Florida, Gainesville, FL — *December 2004 – May 2008*

Grants & Awards

Student Affairs Bonus Program Award, Duke University — *August 2017*

Jhumki Basu Equity Scholars Award, International Conference of the National Association for Research in Science Teaching — *March 2014*

Postdoctoral Travel Award, International Society for the Scholarship of Teaching & Learning — *October 2013*

Postdoctoral Fellow, Undergraduate Science Education Grant, Howard Hughes Medical Institute *June 2013*
Third Place, National Science Foundation Innovation in Graduate Education Challenge *June 2013*
Predoctoral Travel Award, Angioma Alliance, Pathobiology of CCM Scientific Workshop *November 2012*
National Research Service Award, National Institute of Neurological Disorders and Stroke, #F31NS077702 *December 2011 – May 2013*
Predoctoral Fellowship, American Heart Association, #11PRE7360003 *July 2011 – December 2011*
Predoctoral Travel Award, Angioma Alliance, Pathobiology of CCM Scientific Workshop *November 2010*
James B. Duke Fellowship, Duke University *March 2008 – May 2013*
University Scholars Program, University of Florida *April 2006 – May 2008*

Publications

Bennet CL, **McDonald DA**, Finch A, Rennie S, Morse JE. North Carolina medical student views on abortion. NC Med J 2018; 79(1): 14-9. PMCID 29439096

Bennett CL, **McDonald DA**, Dorner SC, Nadel ES, McDonald FS, McPherson JA. Association of the 2003 and 2011 ACGME resident duty hour reforms with internal medicine initial certification exam performance. J Grad Med Educ 2017; 9(6): 789-90. PMCID 29270281

Bennett CL, **McDonald DA**, Chang Y, Finch A, Vuong K, Rennie S, Nadel ES. A national cross-sectional study of surgery residents who underreport duty hours. J Surg Edu 2017; 74(6): 928-33. PMCID 28529194

McDonald DA. PhD supervisors: invest more time. Nature 2017; 545(7653): 158. PMCID 28492248

McDonald DA. Don't let your dissertation run your life. Inside Higher Ed 2017.

Reaves DK, Hoadley KA, Fagan-Solis KD, Jima DD, Bereman M, Thorpe L, Hicks J, **McDonald D**, Troester MA, Perou CM, Fleming JM. Nuclear localized LSR: a novel regulator of breast cancer behavior and tumorigenesis. Molecular Cancer Res 2017; 15(2): 165-78.

Shenkar R, Shi C, Austin C, Moore T, Lightle R, Cao Y, Zhang L, Wu M, Zeineddine HA, Girard R, **McDonald DA**, Rorrer A, Gallione C, Pytel P, Liao JK, Marchuk DA, Awad IA. RhoA kinase inhibition with fasudil versus simvastatin in murine models of cerebral cavernous malformations. Stroke 2017; 48(1): 187-94. PMCID 27829448

Bennett CL, Finch A, Vuong K, **McDonald DA**, Rennie S. Underreporting of duty hours – a national survey of general surgery residents. New England Journal of Medicine 2016; 374: 34.

McDonald DA. Tips for talking about other options. Inside Higher Ed 2016.

McDonald DA, Marchuk DA. The Roles of *KRIT1*, *CCM2*, and *PDCD10* in the Pathogenesis of Cerebral Cavernous Malformations. Epstein's Inborn Errors of Development, 3rd Edition. Erickson B, Wynshaw-Boris T, eds. 2016.

McDonald DA, Council SE, Schroeder SC, Utile S, Phillips RS, Hollowell GP, Key SCS. Identifying promoter activators and repressors using lacZ transgene expression in *Saccharomyces cerevisiae*. Association for Biology Laboratory Education 2015; 37.

Shenkar R, Shi C, Rebeiz T, Stockton RA, **McDonald DA**, Mikati AG, Zhang L, Austin C, Akers AL, Gallione CJ, Rorrer A, Gunel M, Min W, Marcondes J, Lee C, Marchuk DA, Awad IA. Exceptional aggressiveness of cerebral cavernous malformation disease associated with *PDCD10* mutations. Genetics in Medicine 2015; 17(3): 188-96. PMCID 25122144

McDonald DA, Shi C, Shenkar R, Gallione CJ, Akers AL, Li S*, de Castro N*, Berg MJ, Corcoran DL, Awad IA, Marchuk DA. Lesions from sporadic cases of cerebral cavernous malformations harbor somatic mutations in the CCM genes: Evidence for a common biochemical pathway for CCM pathogenesis. Human Molecular Genetics 2014; 23(16): 4357-70. PMCID 24698976.

McDonald DA, Shi C, Shenkar R, Stockton RA, Liu F, Ginsberg MH, Marchuk DA, Awad IA. Fasudil decreases lesion burden in a murine model of cerebral cavernous malformation disease. Stroke 2012;43(2):571-4. PMCID 22034008.

McDonald DA, Shenkar R, Shi C, Stockton RA, Akers AL, Kucherlapati MH, Kucherlapati R, Brainer J, Ginsberg MH, Awad IA, Marchuk DA. A novel mouse model of cerebral cavernous malformations based on the two-hit hypothesis recapitulates the human disease. Human Molecular Genetics 2011;20(2): 211-22. PMCID 20940147.

Jones LL, **McDonald DA**, Borum PR. Acylcarnitines: role in brain. Progress in Lipid Research 2010;49(1):61-75. PMCID 19720082.

*undergraduate co-author

Quoted & Featured

June AW. The Many Paths of the Would-Be Professoriate. Chronicle of Higher Education 2017.

Keeley D. Alumni Profiles Series: Dave McDonald. Duke Graduate School Professional Development Blog 2017.

Roth B. 3 Steps to Reach Your Professional Potential. Working@Duke 2017.

Gibbs KD. Analysis of NIGMS Request for Information on Strategies for Modernizing Biomedical Graduate Education, quoted on pg. 4 under "Curriculum and classroom teaching…" NIGMS Feedback Loop Blog 2016.

What Else Can I Do With My PhD? Duke Clinical and Translational Science Institute 2016.

Presentations

McDonald DA. Assessment for beginners. Oral presentation, OneDuke Conference, May 2017.

Council SE, Grillo WH, Key SCS, Royal MO, **McDonald DA**, Phillips RS, Hollowell GP, White SL. Development and infusion of course-based undergraduate research experiences (CUREs) into introductory core courses of a biology curriculum. American Society for Microbiology Conference for Undergraduate Educators, May 2015.

Shenkar R, Shi C, **McDonald DA**, Austin C, Rorrer A, Gallione CJ, Zhang L, Marchuk DA, Awad IA. A comparison between fasudil and simvastatin treatment in two murine models with cerebral cavernous malformation. Poster, International Stroke Conference, February 2015.

Grillo WH, Hollowell GP, Key SCS, Phillips RS, Royal MO, Council SE, **McDonald DA**, White SL. Development and infusion of course-based undergraduate research experiences (CUREs) into introductory core courses of a biology curriculum. Poster, CUREnet Meeting, March 2014.

Gamble D*, Gallione CJ, **McDonald DA**, North P, Marchuk DA. Somatic mutations leading to vascular anomalies: is the GNAQ somatic mutation the link? Poster, Annual Biomedical Research Conference for Minority Students, November 2013.

McDonald DA, Shenkar R, Shi C, Awad IA, Marchuk DA. Exploring the implications of a two-hit mechanism in cerebral cavernous malformations. Oral presentation, Pathobiology of CCM Scientific Workshop, November 2012.

McDonald DA, Shi C, Shenkar R, Stockton RA, Liu F, Ginsberg MH, Marchuk DA, Awad IA. Fasudil decreases lesion burden in a murine model of cerebral cavernous malformation disease. Oral presentation, Pathobiology of CCM Scientific Workshop, November 2011.

McDonald DA, Shenkar R, Shi C, Akers AL, Stockton RA, Kucherlapati M, Kucherlapati R, Ginsberg MH, Awad IA, Marchuk DA. A second-generation mouse model to study cerebral cavernous malformations lesion development. Poster, American Society for Human Genetics. Annual Meeting, November 2010.

McDonald DA, Shenkar R, Shi C, Akers AL, Stockton RA, Kucherlapati M, Kucherlapati R, Ginsberg MH, Awad IA, Marchuk DA. A second-generation mouse model to study cerebral cavernous malformations lesion development. Angioma Alliance. Oral presentation, Pathobiology of CCM Scientific Workshop, November 2010.

McDonald DA, Akers AL, Kucherlapati R, Kucherlapati M, Shenkar R, Shi C, Awad IA, Marchuk DA. A second-generation mouse model of cerebral cavernous malformation pathogenesis. Poster, North American Vascular Biology Organization. Genetics and Genomics of Vascular Disease Workshop, September 2009.

McDonald DA, Borum PR. Sex steroid hormones affect carnitine concentrations of blood and organs in rats. Poster, Experimental Biology, April 2008.

McDonald DA, Borum PR. Effects of chemical diabetes and starvation on blood and organ carnitine concentrations in rats. Poster, Experimental Biology, April 2007.

*undergraduate co-author

Teaching Experience

Instructor, North Carolina Central University, Durham, NC *August 2013 – January 2015*

- Restructured introductory biology labs with curricula based on authentic research experiences in order to increase student retention and graduation rates
- Taught the laboratories for BIOL 1201: General Biology I (organismal biology and evolution), BIOL 1202: General Biology II (macromolecules and cell structure), and BIOL 2200: General Biology III (molecular biology of cells)

Guest Lecturer, North Carolina Central University

BIOL 1620: Human Anatomy and Physiology, "Nutrition & Metabolism" *April 2014*

BIOL 3100: Genetics, "Tazswana Case Study of Alternative Splicing Mutations" *March 2014*

Instructor, BIOL 4350: Cancer Biology, North Carolina Central University *January 2014 – May 2014*

- Created a writing assignment for students to design their own experiment to study cancer biology
- Guided students through multiple rounds of outlining and revisions
- Enriched the online course through individualized attention and constructive feedback

Instructor, Duke University Talent Identification Program, Winston-Salem, NC *July 2013*

"DNA: Unlocking the Genetic Code"

- Developed an original curriculum on modern topics of genetics and evolution for middle school students
- Utilized active learning, team-based learning, and project-based learning techniques

Guest Lecturer, Duke University *August 2012*

UPGEN 306: Writing Grant Proposals for graduate students, "Specific Aims Pages"

Teaching Assistant, Bio 102L: Genetics and Evolution, Duke University *Fall 2012*

- Led students through weekly labs in genetics, evolution, and bioinformatics using multiple model organisms and *in silico* genetic data analysis
- Helped introduce active learning methods for the pilot semester of this new course
- Held weekly office hours to assist students with assignments, exam preparation and discussion of topics from lecture and lab

Teaching Assistant, University of Florida *Fall 2005, Fall 2006*

CHM 2074L: Honors General Chemistry Lab

- Reinforced concepts of spectrometry, absorption, and electrochemistry
- Guided students through performing labs, analyzing data, and drawing relevant conclusions

Mentoring

Dionna Gamble, University of Maryland, Baltimore County undergraduate *Summer 2013*

- Project: Mutation Analysis of Patients with Sturge-Weber Syndrome and Port-Wine Stains

- Currently a graduate student at Duke University

Nicholas De Castro, Elon University undergraduate *Summer 2012*
- Project: Next-Generation Sequencing Analysis of Sporadic Cerebral Cavernous Malformations Patients
- Currently a veterinary student at North Carolina State College of Veterinary Medicine

Emily Ngan, Duke University undergraduate *Summer 2010*
- Project: The Two-Hit Mutation Mechanism in a Mouse Model of Cerebral Cavernous Malformations
- Currently a medical student at Duke University

Stephanie Li, Duke University undergraduate *Fall 2009, Spring 2010*
- Thesis title: Loss of Heterozygosity in a Somatic Mosaic Cerebral Cavernous Malformation Patient
- Currently a medical resident at Duke University

Academic Activity

Reviewer, HHMI BioInteractive	*August 2014 – January 2015*
Reviewer, *European Journal of Human Genetics*	*June 2014*
Founding Member, North Carolina Central University Postdoc Association	*December 2013 – January 2015*
Duke Reader Project, Duke University	*August 2013 – June 2015*
North Carolina DNA Day Instructor, Northern Vance High School	*April 2013*
Science Fair Judge, North Carolina School of Science and Math	*March 2013*
Scholar, Duke Scholars in Cardiovascular Medicine	*August 2012 – May 2013*
Reviewer, *Syllabus* Journal	*July 2012 – May 2013*
Preparing Future Faculty Program, Duke University	*August 2011 – July 2012*

Memberships & Service

Moderator, Panels on Queer Representation in Pop Culture, NC Comicon	*November 2018 – Present*
Student Affairs Assessment Task Force, Duke University	*September 2016 – Present*
Graduate Student Affairs Advisory Committee, Duke University	*September 2016 – Present*
Graduate Career Consortium	*March 2015 – Present*
National Association of Colleges and Employers	*March 2015 – Present*
Associate Member, American Association for Cancer Research	*September 2014 – January 2015*
Member, National Association for Research in Science Teaching	*December 2013 – January 2015*
Trainee Member, American Society of Human Genetics	*May 2010 – May 2013*
Trainee Member, North American Vascular Biology Organization	*July 2009 – May 2013*

Professional Development

Leadership Institute, North Carolina Association of Colleges and Employers, UNC-Chapel Hill	*March 2019*
Trans & Asexual Training, Duke Center for Sexual and Gender Diversity	*October 2018*
National Conference, Graduate Career Consortium	*June 2017*
Assessment Conference, North Carolina Independent Colleges & Universities	*June 2017*
Applying and Leading Assessment in Student Affairs, Canvas Network Online Course	*June 2017*
Career Development for Biomedical Scientists, National Institutes of Health	*June 2016*
Intercultural Skills Development Program, Duke International House	*May 2016*
National Conference, National Association of Colleges and Employers	*June 2015*