

Marsha P. Cole, Ph.D.
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Terms describing scientific expertise: cardiac and vascular injury, diabetes, mass spectrometry, nitric oxide signaling, inflammation, fatty acid modification, murine models of disease

EDUCATION

UNDERGRADUATE:

1992-1996 University of Kentucky B.S. Chemistry

GRADUATE:

1996-1998 University of Kentucky M.S. Chemistry
Dissertation Title: The Effects of Antioxidants on Membrane Proteins in Oxidative Stress Systems

1999-2004 University of Kentucky Ph.D. Nutritional Sciences
Dissertation Title: Exacerbation of Adriamycin-Induced Cardiac Injury in Inducible Nitric Oxide Synthase Null Mice is Alleviated by Overexpression of Manganese Superoxide Dismutase

POST GRADUATE:

2005-2006 Department of Anesthesiology Bruce A. Freeman, PhD
University of Alabama at Birmingham Redox Biochemistry

2006-2009 Department of Pharmacology & Chemical Biology Bruce A. Freeman, PhD
University of Pittsburgh, School of Medicine, Redox Biochemistry
Pittsburgh, Pennsylvania

ACADEMIC APPOINTMENTS

1996-1998 University of Kentucky, Lexington, Kentucky Teaching Assistant
Department of Chemistry

1999-2000 University of Kentucky, Lexington, Kentucky Teaching Assistant
Department of Nutrition and Food Science

2001-2004 University of Kentucky, Lexington, Kentucky, NIH Predoctoral Scholar
College of Medicine, Graduate Center for Toxicology

2005 University of Alabama, Birmingham, Alabama Postdoctoral Fellow
Department of Anesthesiology

2006-2008 University of Pittsburgh, Pittsburgh, Pennsylvania, NIH Postdoctoral Scholar
School of Medicine, Department of Endocrinology

2009-2010 University of Pittsburgh, Pittsburgh, Pennsylvania, Research Instructor¹

	School of Medicine, Department of Pharmacology & Chemical Biology	
2010-2011	University of Pittsburgh, Pittsburgh, Pennsylvania, School of Medicine, Department of Pharmacology & Chemical Biology	Research Assistant Professor
2011-present	University of Louisville, Louisville, Kentucky, School of Medicine, Department of Biochemistry and Molecular Biology	Assistant Professor²
2013-present	University of Louisville, Louisville, Kentucky, School of Medicine, Department of Physiology and Biophysics	Associate Faculty

1. Maternal leave October-December 2009
2. Maternal leave May-July 2013

PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

Center for Genetics and Molecular Medicine, University of Louisville	2013-present
Center for Diabetes and Obesity	2012-present
Gheens Center on Aging	2012-present
American Heart Association	2010-present
Society for Free Radical Biology and Medicine	2000-present
American Chemical Society	1998-present

HONORS AND AWARDS

1995	Regional Undergraduate Chemistry Award University of Kentucky, Department of Chemistry, Lexington, Kentucky Dates
1995-1996	Howard Hughes Medical Institute Award University of Kentucky, Department of Chemistry, Lexington, Kentucky
2002	Young Investigator Award* Society for Free Radical Biology and Medicine
2005	Career Enhancement Award Postdoctoral Office, University of Alabama, Birmingham, Alabama
2005	Young Investigator Award* Society for Free Radical Biology and Medicine
2007	Young Investigator Award* Society for Free Radical Biology and Medicine
2012	Pre-Tenure Career Conference Award Dean's Office, University of Louisville, Louisville, KY

*10 total awards per year nationally (out of all graduate and postdoctoral student members in the Society)

FELLOWSHIPS

- 2001-2004 NIH Predoctoral Scholar (NRSA), Graduate Center for Nutritional Sciences, College of Medicine, University of Kentucky, Lexington, Kentucky
- 2006-2008 NIH Postdoctoral Scholar (NRSA), Department of Endocrinology, School of Medicine, University of Pittsburgh, Pennsylvania
- 2009-2010* Hartwell Fellowship, Department of Pharmacology & Chemical Biology, School of Medicine, University of Pittsburgh, Pennsylvania

*1 of 10 fellows in the US

BACKGROUND AND CAREER GOALS

In my career thus far, I have developed the skills necessary to study the impact of endogenous mitochondrial nitration products on cardiovascular function in health and disease states. I have been passionately pursuing a career in academic biomedical research since I was an undergraduate in 1994. I have had the desire to apply my biochemical knowledge to mechanisms of disease in medicine since my first experience with research. While obtaining my B.S. in Chemistry, I participated in independent research using electron paramagnetic resonance (EPR) spectrometry to study antioxidant strategies for the prevention of ischemia reperfusion injury (under the mentorship of Dr. Allan Butterfield). After deciding to become a doctoral student, I obtained the necessary research and academic training in chemistry and nutrition at the University of Kentucky, enabling me to understand advanced biochemical metabolism, fatty acid synthesis, transport and nitration. Further, I built a solid foundation of knowledge in oxidative cardiac injury and redox signaling in the laboratory of Dr. Daret St. Clair, where I studied the role of nitric oxide in doxorubicin-induced cardiac injury. Overall, I have been working with animal-based disease models for approximately 20 years.

Throughout my graduate career I acquired strong biochemical skills related to cardiovascular inflammatory injury. Importantly, during a 3 year postdoctoral fellowship, I had the opportunity to expand this training and have acquired significant expertise in HPLC-ESI MS/MS under the mentorship of Dr. Bruce Freeman. I have continuously participated in intra- and extramural activities to present my research findings, as well as having authored and co-authored original manuscripts in high impact peer-reviewed journals. As a result, I was promoted to Research Instructor and subsequently Research Assistant Professor following my postdoc fellowship at the University of Pittsburgh.

Since competing for and obtaining a 5-year pathway to independence career award (K99/R00) in 2010, I have aggressively pursued academic independence. After arriving at the University of Louisville, I assembled a dynamic research team consisting of a research technician (whom has been with me for 6 years), 4 graduate students, a postdoctoral student, and a high school student. **While conceiving independent research ideas, I consistently engage in service (including SOM and department committees, as well as participating as a peer reviewer for journals and grant applications), and academic teaching (including medical, dental, graduate, undergraduate and high school students).** I am committed to the training of graduate and medical students in the field of biochemistry. My overall plan is to continue to develop new research insights into molecular mechanisms and treatment of disease with the goal of becoming a leading independent academic investigator in the field of oxidative injury and inflammation.

COMMITTEE ASSIGNMENTS AND ADMINISTRATIVE SERVICES

Early Career Reviewer Program – NIH/NHLBI (placed on contact list in March 2014)

American Heart Association Peer Review – Vascular Wall Biology 4 (2011-present; 2 cycles/year; 5-7 grants per cycle)

School of Medicine Website Committee, University of Louisville (2013-present)

Curriculum Committee-Biochemistry and Molecular Biology, University of Louisville (2012-present)
 Personnel Committee-Biochemistry and Molecular Biology, University of Louisville (2015-present)
 Society for Free Radical Biology and Medicine Council since 2010 [Chair for Free Radical School (2015); Chair for Website (2010-2012) and Junior Awards (2013-2014)]

EDUCATIONAL ACTIVITIES

Course Lectures

Chemistry – General, analytical, and organic chemistry

Taught laboratory and lecture classes for 6 semesters (1996-1998)

Nutritional Biochemistry – Advanced nutrition and metabolism

Taught course lectures for dietician and nutrition undergraduate students (1999-2000)

Responsible Conduct of Research: Survival skills and ethics in research

1-2 lectures each Spring Semester (2012-present)

Dental Biochemistry – Co-Course Director (2015) and lecturer (Lipid Biochemistry ~7 lectures)

Students

Name	Type of Student	Year(s)	Present Position
Patrick Van Hoose	graduate (PhD)	2012-present	
Natia Q. Kelm	postdoc/graduate (PhD)	2013-present	
Catherine Cobb	graduate (PhD)	2014-present	
Linda Omer	graduate (PhD)	2014-present	
Jane Solinger	high school	2013-present	
Christa Hitchner	high school	1999-2000	Clinical Dietitian – Washington D.C.
Nikiru Motanya	undergraduate	2006-2008	Post-bac/pre-med UPenn
Kellianne Piell	undergraduate	2008-2011	Research Assistant Senior UofL
Megan Caroway	medical	2012-2013	Medical Student Univ of Cincinnati
Masarath Aman	undergraduate	2012	Research Assistant UofL

PhD Student Committees

Patrick Van Hoose	graduate student	primary mentor (Biochemistry)	2012-present
Natia Q. Kelm	graduate student	primary mentor (Physiology)	2013-present
Linda Omer	graduate student	primary mentor (Biochemistry)	2014-present
Catherine Cobb	graduate student	primary mentor (Biochemistry)	2014-present
Lindsey Beck	graduate student	committee member	PhD, 2014
Thibaut Barnoud	graduate student	committee member	2013-present
Bathri Vajravelu	graduate student	committee member	2013-present
Diana Avila	graduate student	committee member	2014-present
Adjoa Boakye	graduate student	committee member	2014-present

GRANTS

Research Support

Current:

R00HL095769

06/19/12-05/31/15

Principal Investigator: Cole, Marsha P

Metabolic Stress-Induced Fatty Acid Nitration and Cardiovascular Function

NIH/NHLBI

Percent Effort: 75%

P20 GM103494

Principal Investigator: Bhatnagar, Aruni
Center for Excellence in Diabetes and Obesity Research
 NIH/NIGMS
 Percent Effort: 5%
 Role Collaborator

09/01/13-06/30/18

School of Medicine Basic Grant-University of Louisville

Principal Investigator: Cole, Marsha P
Preservation of cardiovascular function using conjugated linoleic acid (cLA) in combination with nitrite following myocardial ischemia (MI)
 Percent Effort: N/A

12/01/13-11/30/14

KSTC-184-512-14-176 (SBIR-STTR Matching Funds Award)

Principal Investigator: Wang, Eugenia
Generating Transgenic mouse mutants overexpressing key circulating microRNAs in blood plasma
 Percent Effort: 2.5%
 Role: Subcontract PI

01/01/14-12/31/2014

Completed:

1K99HL095769

Principal Investigator: Cole, Marsha P
Metabolic Stress-Induced Fatty Acid Nitration and Cardiovascular Function
 NIH/NHLBI

06/01/10-05/31/2012

Hartwell Foundation

Principal Investigator: Cole, Marsha P
Fellowship Award for Career Development
 Role: Postdoctoral Fellow/Trainee

01/01/09-12/31/11

P30 DK046204-15

Principle Investigator: Cole, Marsha P
 NIH/ONRC Pilot/Feasibility Grant
Nitro-Fatty Acid Modulation in Type II Diabetes

03/01/08-02/28/09

EDITORIAL WORK***Manuscript Review (Ad Hoc)***

Environmental Health Perspectives
 Journal of Biological Chemistry
 International Journal of Cardiology
 The Journal of Immunology
 PLOS ONE
 Journal of Endocrinology
 Journal of Molecular Pharmaceutics
 Molecular and Cellular Endocrinology

PUBLICATIONS***Peer-Reviewed Journals***

1. Chaiswing L, **Cole MP**, St. Clair DK, Ittarat W, Szweda L, and Oberley TD. Oxidative damage precedes nitrative damage in adriamycin-induced cardiac mitochondrial injury. *Toxicol Path*, 32:1-12, 2004.

2. Humphrey ML, **Cole MP**, Pendergrass JC, and Kiningham KK. Mitochondrial mediated thimerosal-induced apoptosis in a human neuroblastoma cell line (SK-N-SH). *Neurotoxicology*, 26(3):407-16, 2005.
3. Joshi G, Sultana R, Tangpong J, **Cole MP**, St. Clair DK, Vore M, Estus S, and Butterfield DA. Free radical mediated oxidative stress and toxic side effects in brain induced by the anti cancer drug adriamycin: insight into chemobrain. *Free Radic Res*, 39(11):1147-54, 2005.
4. Chaiswing L, **Cole MP**, Ittarat W, Szweda LI, St. Clair DK, and Oberley TD. Manganese superoxide and inducible nitric oxide synthase modify early oxidative events in acute Adriamycin-induced mitochondrial toxicity. *Mol Cancer Ther*, 4(7):1056-64, 2005.
5. Tangpong J, **Cole MP**, Estus S, Vore M, St. Clair W, Ratanachaiyavong S, St. Clair DK, and Butterfield DA. Adriamycin-induced, TNF- α -mediated central nervous system toxicity. *Neurobiol Dis* 23(1): 127-39, 2006.
6. Jungsuwadee P, **Cole MP**, Sultana R, Joshi G, Tangpong J, Butterfield DA, St. Clair DK, and Vore M. Increase in Mrp 1 expression and 4-hydroxy-2-nonenal adduction in the heart tissue of Adriamycin-treated C57BL/6 mice. *Mol Cancer Ther*, 5(11): 2851-60, 2006.
7. **Cole MP**, Chaiswing L, Oberley TD, Edelmann SE, Piascik MT, Lin SM, Kiningham KK, and St. Clair DK. The protective roles of nitric oxide (NO) and superoxide dismutase (SOD) in Adriamycin (ADR)-induced cardiotoxicity. *Cardiovasc Res*, 69(1):186-97, 2006.
8. Tangpong J, **Cole MP**, Sultana R, Estus S, Vore M, St. Clair W, Ratanachaiyavong S, St. Clair DK, and Butterfield DA. Adriamycin mediated nitration of manganese superoxide dismutase in the central nervous system: insight into the mechanism of chemobrain. *J Neurochem*, 100(1):191-201, 2007.
9. Spasojević I, Chen Y, Noel TJ, Yu Y, **Cole MP**, Zhang L, Zhao Y, St. Clair DK, and Batinic-Haberle I. Mn porphyrin-based superoxide dismutase (SOD) mimic, Mn(III) TE-2-PyP(5+), targets mouse heart mitochondria. *Free Radic Biol Med*, 42(8):1193-200, 2007.
10. Nithipongvanitch R, Ittarat W, **Cole MP**, Tangpong J, St. Clair, DK, and Oberley, TD. Mitochondrial and nuclear p53 localization in cardiomyocytes: redox modulation by Adriamycin. *Antioxid Redox Signal*, Jul;9(7):1001-8. Review, 2007.
11. Kiningham KK, Cardozo ZA, Cook C, **Cole MP**, Stewart JC, Tassone M, Coleman MC, Spitz DR. All-trans-retinoic acid induces manganese superoxide dismutase in human neuroblastoma through NF-kappa B. *Free Radic Biol Med*, 44(8):1610-6, 2008.
12. Kim C-S, Jung S-B, Naqvi A, Hoffman TA, DeRicco J, Yamamori T, Jeon BH, **Cole MP**, and Irani K. P53 impairs endothelium-dependent vasomotor function by transcriptionally upregulating p66shc expression. *Circ Res*, 103(12):1441-50, 2008.
13. Iles KE, Wright MM, **Cole MP**, Welty NE, Ware LB, Matthay MA, Schopfer FJ, Baker PR, Agarwal A, and Freeman BA. Fatty acid transduction of nitric oxide signaling: LNO₂ mediates protective effects through regulation of the ERK pathway. *Free Radic Biol Med*, 46(7):866-75, 2009.
14. Rudolph V, Schopfer FJ, Khoo NH, Rudolph TK, **Cole MP**, Woodcock S, Baker PR, Golin-Bisello F, Bonacci G, Groeger A, Chen CS, and Freeman BA. Metabolism of nitro-oleic acid: saturation, desaturation and β -oxidation. *J Biol Chem*, 284(3):1461-73, 2009.

15. Schopfer FJ, Batthyány C, Baker PRS, Bonacci G, **Cole MP**, Rudolph V, Rudolph TK, Nadtochiy S, Brookes PS, and Freeman, BA. Detection and quantification of protein adduction by electrophilic fatty acid nitration products: mitochondrial generation of fatty acid nitroalkene derivatives. *Free Radic Biol Med*, 46(9):1250-9, 2009.
16. **Cole MP** and Freeman BA. Promotion of cardiovascular disease by exposure to the air pollutant ozone. *Am J Physiol Lung Cell Mol Physiol*, 297:L205-8, 2009.
17. **Cole MP**, Rudolph TK, Khoo NH, Motanya UN, Golin-Bisello F, Wertz JW, Schopfer FJ, Rudolph V, Woodcock S, Bolisetty S, Ali MS, Zhang J, Chen YE, Agarwal A, Freeman BA, and Bauer PM. Nitro-fatty acid inhibition of neointima formation after endoluminal vessel injury. *Circ Res*, 105(10):965-72, 2009.
18. Rudolph V, Rudolph TK, Schopfer FJ, Bonacci G, Woodcock SR, **Cole MP**, Baker PRS, Ramani R, and Freeman BA. Endogenous generation and protective effects of nitro-fatty acids in a murine model of focal cardiac ischemia and reperfusion. *Cardiovasc Res*, 85(1):155-66, 2009.
19. Khoo NK, Rudolph V, **Cole MP**, Golin-Bisello F, Schopfer FJ, Woodcock SR, Batthyany C, Freeman BA. Activation of vascular endothelial nitric oxide synthase and heme oxygenase-1 expression by electrophilic nitro-fatty acids. *Free Radic Biol Med*, 48(2):230-9, 2010.
20. Borniquel S, Jansson EÅ, **Cole MP**, Freeman BA, and Lundberg JO. Nitrated oleic acid up-regulates colonic peroxisome proliferator-activated receptor gamma and attenuates experimental inflammatory bowel disease. *Free Radic Biol Med*, 48(4):499-505, 2010.
21. Joshi G, Aluise CD, **Cole MP**, Sultana R, Pierce WM, Vore M, St. Clair DK, and Butterfield DA. Alterations in brain antioxidant enzymes and redox proteomic identification of oxidized brain proteins induced by the anti-cancer drug Adriamycin: implications for oxidative stress-mediated chemobrain. *Neuroscience*, 166(3):796-807, 2010.
22. Schopfer FJ*, **Cole MP***, Groeger A*, Chen C-S, Woodcock S, Golin-Bisello F, Motanya UN, , Khoo NH, Rudolph T, Rudolph V, Hallis TM, Bonacci G, Xu HE, Chen YE, Agarwal A, and Freeman BA. Covalent peroxisome proliferator-activated receptor γ binding by nitro-fatty acids: distinctive coregulatory protein interactions and restoration of insulin sensitivity. *J Biol Chem*, 285(16):12321-12333, 2010.
*contributed equally
23. Rudolph, TK, Rudolph V, Edreira MM, Bonacci G, Schopfer FJ, Woodcock SR, **Cole MP**, Khoo NKH, Hasty A, and Freeman BA. Nitro-fatty acids reduce atherosclerosis in apoE^{-/-} mice. *Arterioscler Thromb Vasc Biol*, 30(5):938-945, 2010.
24. Groeger AL, Cipollina C, **Cole MP**, Woodcock SR, Bonacci G, Rudolph TK, Rudolph V, Freeman BA and Schopfer FJ. Cyclooxygenase-2 generates anti-inflammatory mediators from omega-3 fatty acids. *Nat Struct Mol Biol*, 6(6):433-441, 2010.
25. Zhang J, Villacorta L, Chang L, Fan Z, Hamblin M, Zhu T, Chen CS, **Cole MP**, Schopfer FJ, Deng CX, Garcia-Barrio MT, Feng YH, Freeman BA, and Chen YE. Nitro-oleic acid inhibits angiotensin II-induced hypertension. *Circ Res*, 107(4):540-548, 2010.
26. Jung S-B, Kim C-S, Naqvi A, Yamamori T, Mattagajasingh I, Hoffman TA, **Cole MP**, Jumar A, DeRicco J, Jeon BH, and Irani K. Histone Deacetylase-3 antagonizes Aspirin-stimulated Endothelial Nitric Oxide production by reversing Aspirin-induced lysine acetylation of Endothelial Nitric Oxide Synthase. *Circ Res*, 107(7):877-887, 2010.

27. Bonacci G, Baker PRS, Salvatore SR, Shores D, Khoo NKH, Koenitzer JR, Vitturi DA, Woodcock SR, Golin-Bisello F, **Cole MP**, Watkins S, St. Croix C, Batthyany CI, Freeman BA and Schopfer FJ. Conjugated linoleic acid is a preferential substrate for fatty acid nitration. *J Biol Chem*, 287(53):44071-44082, 2012.

28. Kelm NQ, Piell KM, Solinger JC, and **Cole MP**. Combination treatment with conjugated linoleic acid and nitrite protects against myocardial infarction. *Redox Biol*, 2:1-7, 2013.

29. **Cole MP***, Chaiswing L, Oberley TD, Kiningham KK, and St. Clair DK. Nuclear interaction between ADR-Induced p65 and p53 mediates cardiac injury in iNOS (-/-) mice. *PLoS ONE*, 9(2):e89251, 2014.

***Corresponding Author**

30. Piell KM, Kelm NQ, Caroway MC, Aman M, and **Cole MP**. Nitrite attenuates conjugated linoleic acid induced cardiac dysfunction in aged mice. *Free Rad Biol Med*, 72:66-75, 2014.

In preparation/submitted

31. Kelm NQ, Wang E, and **Cole MP**. MicroRNA-1 predicts myocardial injury in aged mice. *Submitted, J Cell Physiol, JCP-14-0818*.

32. Bonsignore L, Tooley JG, Van Hoose PM, Wang E, Cheng A, **Cole MP**, and Tooley CS. NRMT1 knockout mice exhibit phenotypes associated with impaired DNA repair and premature aging. *Submitted, Mech Ageing Dev*.

33. Cobb C and **Cole MP**. Redox signaling of oxidative/nitrative lipids in neurodegenerative diseases. *Manuscript in preparation for Neurobiology of Disease, to be submitted January 2015*.

34. Van Hoose P, Piell KM, and **Cole MP**. Nitrite compensates for conjugated linoleic acid-induced changes in cardiac mitochondrial function and activity in a murine model of myocardial infarction. *Manuscript in preparation for J Clin Invest, to be submitted mid March 2015*.

Book Chapters and Invited Reviews

Cole MP, Chaiswing L, Oberley TD, Kiningham KK, and St. Clair DK. Superoxide, superoxide dismutases, and cardiovascular dysfunction. *Mechanisms of Cardiovascular Aging*, Chapter 9 (Elsevier, Editor Tory Hagen), December 2002.

Cole, MP and Freeman, BA. Nitric oxide modulation of inflammatory-mediated lipid signaling. *Nitric Oxide*, 2nd Edition, Chapter 11 (Elsevier, Editor Louis Ignarro), 391-414, 2010.

ABSTRACTS AND PRESENTATIONS

Published Abstracts

1. **Ball Marsha C**, Oberley TD, Lin SM, Hines JN, and St. Clair DK. Generation and characterization of inducible nitric oxide synthase (iNOS) knock-out and over-expressing manganese superoxide dismutase (MnSOD) cross-breed mouse model for investigation of the role of nitric oxide (NO) in Adriamycin (ADR)-induced cardiac toxicity. *Free Radic Biol Med*, 29:S66, supplement 1, 2000.

2. **Cole MP**, Oberley TD, Lin SM, Kiningham KK, and St. Clair DK. Loss of adaptive response to oxidative stress and exacerbation of Adriamycin (ADR)-induced cardiac injury in inducible nitric oxide synthase homozygous knock-out mice. *Free Radic Biol Med*, 31:S68, supplement 1, 2001.

3. Kiningham KK, **Cole MP**, Pendergrass JC, and St. Clair DK. Mitochondrial mediated apoptosis in a human neuroblastoma cell line (SK-N-SH) by thimerosal: A proapoptotic role for nuclear factor kappa binding protein (NFκB). *Tox Sci*, 66:1-S:209, 2002.
4. **Cole MP**, Oberley TD, Lin SM, Kiningham KK, and St. Clair DK. Inducible nitric oxide synthase knock-out (iNOS (-/-)) mice exhibit increased oxidative stress injury in response to Adriamycin (ADR)-induced cardiotoxicity. *Tox Sci*, 66:1-S:279, 2002.
5. Chaiswing L, Oberley TD, Szweda LI, **Cole MP**, Ittarat W, and St. Clair DK. In vivo analysis of ROS/RNS in adriamycin-induced cardiotoxicity. *Free Radic Biol Med*, 33:S410, supplement 2, 2002.
6. **Cole MP**, Lin SM, Chaiswing L, Kiningham KK, Oberley TD, and St. Clair DK. Intricate relationship between nitric oxide (NO) and superoxide dismutase (SOD) in the protection against Adriamycin (ADR)-induced cardiotoxicity. *Free Radic Biol Med*, 33:S379, supplement 2, 2002.
7. Kiningham K, Davis J, Stewart J, Cook C, Dhar S, and **Cole MP**. All-trans retinoic acid (ATRA) mediated differentiation of neuroblastoma: potential role of manganese superoxide dismutase (MnSOD). *Free Radic Biol Med*, 35:S169, supplement 1, 2003.
8. Chaiswing L, Oberley TD, **Cole MP**, Ittarat W, and St. Clair DK. Change in ROS/RNS levels in mitochondria precede adriamycin-induced cardiac mitochondrial ultrastructural changes. *Free Radic Biol Med*, 35:S130, supplement 1, 2003.
9. **Cole MP**, Chaiswing L, Oberley T, Kiningham K, and St. Clair DK. Reactive oxygen species generated by Adriamycin (ADR) play a central role in the distribution of transcription factors between nuclear and mitochondrial compartments. *Free Radic Biol Med*, 35:S117, supplement 1, 2003.
10. Tangpong J, Sultana R, Joshi G, **Cole MP**, Estus S, Vore M, Ratanachaiyavong S, St. Clair W, St. Clair DK, and Butterfield DA. Adriamycin-induced central nervous system toxicity: An insight into the mechanism of "chemobrain". *Free Radic Biol Med*, 37:S164, supplement 1, 2004.
11. **Cole MP**, Chaiswing L, Oberley T, Kiningham, K, and St. Clair DK. Overexpression of MnSOD suppresses p53-mediated ADR-induced cardiac injury in mice lacking iNOS. *Free Radic Biol Med*, 37:S132, supplement 1, 2004.
12. Tangpong J, **Cole MP**, Estus S, Vore M, St. Clair W, Ratanachaiyavong S, St. Clair DK, and Butterfield DA. Adriamycin-induced TNF-α-mediated central nervous system toxicity: Insights into the mechanism of chemobrain. *Free Radic Biol Med*, 39:S64, supplement 1, 2005.
13. **Cole MP**, Groeger AL, Schopfer FJ, Baker PRS, Iles KE, Long MH, Chumley PH, and Freeman BA. Inflammatory oxidants induce fatty acid nitration *in vivo*. *Free Radic Biol Med*, 39:S83, supplement 1, 2005.
14. Spasojević I, Batinic-Haberle I, Yu Y, Chen Y, Noel TJ, **Cole MP**, Zhao Y, and St. Clair DK. Mn Porphyrin-based SOD mimic, MnTe-2-PyP⁵⁺ (AEOL-10113), targets mouse heart mitochondria after single 10 mg/kg IP administration. *Free Radic Biol Med*, 41:S12, supplement 1, 2006.
15. Iles KE, **Cole MP**, Saini D, Wright M, Powell P, Schopfer FJ, Baker PRS, Matthay M, Agarwal A, and Freeman BA. Fatty acid transduction of nitric oxide signaling: inflammation induces the generation and adaptive mediator actions of LNO₂ in the Lung. *Free Radic Biol Med*, 41:S34, supplement 1, 2006.

16. **Cole MP**, Motanya UN, Schopfer FJ, Woodcock SR, Golin-Bisello F, and Freeman BA. Nitro-fatty acids induce anti-inflammatory therapeutic effects in a murine model of type II diabetes. *Free Radic Biol Med*, 43:S44, supplement 1, 2007.
17. **Cole MP**, Rudolph TK, Khoo NKH, Motanya UN, Golin-Bisello F, Wertz JW, Schopfer FJ, Woodcock SR, Ali MS, Zhang J, Chen YE, Bauer PM, and Freeman BA. Nitro-fatty acid inhibition of endoluminal vessel injury. *Free Radic Biol Med*, 45:S142, supplement 1, 2008.
18. Motanya UN, Hales AM, **Cole MP**, Schopfer FJ, and Freeman BA. Nitro-fatty acids are orally bioavailable. *Free Radic Biol Med*, 45:S88, supplement 1, 2008.
19. Schopfer FJ, Groeger A, Bonacci GR, Chen C-S, **Cole MP**, Batthyány C, Baker P, Zhang J, Hallis T, Chen YE, and Freeman BA. In vivo activation of PPAR γ by nitro-fatty acids involves nitroalkylation of PPAR γ . *Free Radic Biol Med*, 45:S37, supplement 1, 2008.
20. Bonacci GR, Schopfer FJ, Chen C-S, **Cole MP**, Golin-Bisello F, Groeger A, Kelley EE, and Freeman BA. Nitro-oleic acid improves insulin signaling via protein tyrosine phosphatase-1B inhibition. *Free Radic Biol Med*, 45:S154, supplement 1, 2008.
21. Rudolph TK, **Cole MP**, Bauer PM, and Freeman BA. Abstract 1704: Nitro-fatty acid inhibition of neointima formation after endoluminal vessel injury. *Circ.*, 118:S_372, 2008.
22. Rudolph TK, Rudolph V, Edreira MM, **Cole MP**, Bonacci G, Schopfer FJ, Woodcock SR, Groeger A, Khoo NK, and Freeman BA. Abstract 5576: Nitro-fatty acids reduce atherosclerosis in ApoE deficient mice. *Circ.*, 120:S1120, 2009.
23. Bonacci GR, Schopfer FJ, Koenitzer J, Woodcock SR, Rudolph V, Rudolph TK, **Cole MP**, and Freeman BA. Mitochondrial nitration of fatty acids. *Free Radic Biol Med*, 47:S119, supplement 1, 2009.
24. Borniquel S, **Cole MP**, Freeman BA, and Lundberg JO. Dietary nitrate, olive oil and inflammatory bowel disease. *Free Radic Biol Med*, 49:S109, supplement 1, 2010.
25. Piell K, Salvatore SR, Bonacci G, Schopfer FJ, and **Cole MP**. Co-administration of nitrite and conjugated linoleic acid attenuates cardiac dysfunction in leptin deficient mice. *Free Radic Biol Med*, supplement 1, 2011.
26. Van Hoose P, Piell KM, **Cole MP**. Co-administration of nitrite and conjugated linoleic acid promotes changes in cardiac mitochondrial function and activity in a murine model of obesity. *Free Radic Biol Med*, supplement 1, 2013.
27. Kelm NQ, Piell KM, Solinger JC, and **Cole MP**. Combination treatment with conjugated linoleic acid and nitrite protects against myocardial infarction. *Free Radic Biol Med*, supplement 1, 2013.
28. Piell KM, Kelm NQ, Caroway MC, Aman M, and **Cole MP**. Nitrite attenuates conjugated linoleic acid induced cardiac dysfunction in aged mice. *Free Radic Biol Med*, supplement 1, 2013.
29. Van Hoose P, Piell KM, Kelm NQ, and **Cole MP**. Conjugated linoleic acid and nitrite co-treatment alter cardiac mitochondrial function and complex activity in vivo. *Free Radic Biol Med*, supplement 1, 2014.
30. Piell KM, Kelm NQ, and **Cole MP**. Nox4 derived hydrogen peroxide contributes to conjugated linoleic acid and nitrite-induced cardiac protection. *Free Rad Biol Med*, supplement 1, 2014.
31. Kelm NQ, Van Hoose PM, Piell KM, and **Cole MP**. Nitrite supplementation rescues life-threatening arrhythmias in conjugated linoleic acid treated mice following myocardial infarction. *Free Radic Biol Med*, supplement 1, 2014.

INVITED SPEAKER

2003 Reactive oxygen species generated by Adriamycin (ADR) play a central role in the distribution of transcription factors between nuclear and mitochondrial compartments. Society for Free Radical Biology and Medicine Meeting, Seattle, WA. This work was 1 of only 48 selected from 575 submitted abstracts for an oral presentation.

2005 Inflammatory oxidants induce fatty acid nitration *in vivo*. Society for Free Radical Biology and medicine Meeting, Austin, TX, 2005. This work was 1 of 74 selected from ~800 submitted abstracts for an oral presentation. **I received a Young Investigator Award for this work.**

2006 Fatty Acid Transduction of Nitric Oxide Signaling: Inflammation Induces the Generation and Adaptive Mediator Actions of LNO₂ in the Lung. This work was selected among submitted abstracts for an oral presentation. Society for Free Radical Biology and Medicine, Denver, CO.

2007 Nitro-fatty acids induce anti-inflammatory therapeutic effects in a murine model of type II diabetes. Society for Free Radical Biology and Medicine, Washington, DC. This work was selected among submitted abstracts for an oral presentation. **I received a Young Investigator Award for this work.**

2008 Nitrated fatty acid-induced anti-inflammatory effects in murine models of disease. The University of Pittsburgh Postdoctoral Association, August 20.

2010 Redox signaling of anti-inflammatory mediators in disease. University of Pittsburgh, Graduate School of Public Health, Department of Environmental and Occupational Health, October 21.

2011 Fatty acid transduction of nitric oxide signaling: resolution of inflammation in disease. University of Louisville, Department of Biochemistry and Molecular Biology, March 22.

2011 Co-administration of nitrite and conjugated linoleic acid attenuates cardiac dysfunction in leptin deficient mice. Society for Free Radical Biology and Medicine, Atlanta, GA. **This work was in the top 5 of abstracts selected for oral presentation (out of ~800).**

2012 Yes, you can still be successful in obtaining a job in this current economy. NIH-NIEHS, Research Triangle Park, NC, April 27.

2012 Just Say •NO to Diabetes. University of Louisville Department of Medicine, Division of Endocrinology, Metabolism and Diabetes, June 6.

2012 Climbing the ladder towards success: things you need to know, University of Louisville, Postdoctoral Appreciation Luncheon, September 13.

2012 Obtaining Funding: NIH K99/R00 Pathway to Independence Grants. Society for Free Radical Biology and Medicine Meeting, San Diego, CA, November 17.

2013 Anti-inflammatory signaling of nitrated fatty acid precursors in type II diabetes and cardiovascular injury, University of Louisville Department of Medicine, Diabetes and Obesity Center, February 26.

2014 Mirror, mirror on the wall, is cLA good for all? University of Louisville Department of Medicine, Division of Endocrinology, Metabolism and Diabetes, May 21.

Selected Poster Presentations

2000 Generation and characterization of inducible nitric oxide synthase (iNOS) knock-out and over-expressing manganese superoxide dismutase (MnSOD) cross-breed mouse model for investigation of the role of nitric oxide (NO) in Adriamycin (ADR)-induced cardiac toxicity. Society for Free Radical Biology and Medicine Meeting, San Diego, CA, 2000. This work was presented in a poster session.

2001 Loss of adaptive response to oxidative stress and exacerbation of adriamycin-induced cardiac injury in inducible nitric oxide synthase homozygous knock-out mice. Society for Free Radical Biology and Medicine Meeting, Durham, NC. This work was presented in a poster session.

2002 Inducible nitric oxide synthase knock-out (iNOS (-/-)) mice exhibit increased oxidative stress injury in response to Adriamycin (ADR)-induced cardiotoxicity. Society of Toxicology Meeting, Nashville, TN. This work was presented in a poster-discussion session on oxidative injury.

2002 Intricate relationship between nitric oxide (NO) and superoxide dismutase (SOD) in the protection against Adriamycin (ADR)-induced cardiotoxicity. Society for Free Radical Biology and Medicine Meeting, San Antonio, TX. **This work was presented in a poster session for which I won a Young Investigator Award.**

2004 Overexpression of MnSOD suppresses p53-mediated ADR-induced cardiac injury in mice lacking iNOS. Society for Free Radical Biology and Medicine Meeting, St. Thomas, US Virgin Islands. This work was presented in a poster session

2008 Nitro-fatty acid inhibition of endoluminal vessel injury. Society for Free Radical Biology and Medicine Meeting, Indianapolis, IN. This work was presented at a poster session.

2013 Co-administration of conjugated linoleic acid and nitrite attenuates cardiac dysfunction in leptin deficient mice. NIH K-Award Meeting, Cardiovascular Sciences, Bethesda, MD. This work was presented in a poster session

MP Cole as corresponding author

2013 Van Hoose P, Piell KM, and **Cole MP**. Co-administration of nitrite and conjugated linoleic acid promotes changes in cardiac mitochondrial function and activity in a murine model of obesity. Research!Louisville **This work was selected for oral presentation at the Society for Free Radical Biology and Medicine 2013**

2013 Kelm NQ, Piell KM, Solinger JC, and **Cole MP**. Combination treatment with conjugated linoleic acid and nitrite protects against myocardial infarction. Research!Louisville

2014 Van Hoose P, Piell KM, Kelm NQ, and **Cole MP**. Conjugated linoleic acid and nitrite co-treatment alters cardiac mitochondrial function and complex activity in vivo. Research!Louisville

2014 Piell KM, Kelm NQ, and **Cole MP**. Nox4 derived hydrogen peroxide contributes to conjugated linoleic acid and nitrite-induced cardiac protection. Research!Louisville

2014 Kelm NQ, Van Hoose PM, Piell KM, and **Cole MP**. Nitrite supplementation rescues life-threatening arrhythmias in conjugated linoleic acid treated mice following myocardial infarction. Research!Louisville

2014 Cobb C, Piell K, Van Hoose P, and **Cole MP**. 8-Isoprostane generation following co-treatment with conjugated linoleic acid and nitrite may promote myocardial protection. Research!Louisville

2014 Omer L, Piell K, and **Cole MP**. Conjugated linoleic acid and nitrite co-treatment mediates protective signaling in aged kidney. Research!Louisville

Meeting Organization

May 6, 2002 Oxidative Stress in Nutrition Symposium, University of Kentucky

Coordinated the first one-day symposium sponsored by the NIH Training Grant in Oxidative Stress and Nutrition, which included four speakers outside of the University of Kentucky and two internal speakers. Three disciplines associated with nutrition were reviewed, including cancer, alcohol, neurology, and cardiology.

April 7, 2003 Oxidative Stress in Nutrition Symposium, University of Kentucky

Coordinated a one-day symposium sponsored by the NIH Training Grant in Oxidative Stress and Nutrition, which included five speakers outside of the University of Kentucky and one internal speaker. Four disciplines associated with nutrition were reviewed, including cancer, obesity, alcohol, neurology, and cardiology.

May 17, 2004 Oxidative Stress in Nutrition Symposium, University of Kentucky

Coordinated a one-day symposium sponsored by the NIH Training Grant in Oxidative Stress and Nutrition, including five speakers outside of the University of Kentucky and one internal speaker. Seminars included subject areas from four disciplines including alcohol, neurology, cancer, and cardiology.