

## **Personal Information**

**Full Name:** L. Ashley Cowart, Ph.D.

**Title:** Professor, Director, Lipidomics Core Facility, Research Health Scientist

**Business Name:** Virginia Commonwealth University

**Business Address:** 1101 E. Marshall St., Sanger Hall 2-016A, Richmond, VA 23219

**Phone:** 804-827--791

**Email:** lauren.cowart@vcuhealth.org

**Languages Spoken:** English

## **Professional Summary**

### **Primary Departmental Specialization Area/Field**

Lipid metabolism, signaling, and biology in the context of diabetes and related metabolic disorders

### **Areas of Expertise and Interest**

lipid signaling

sphingolipids

ceramide

sphingosine-1-phosphate

enzyme kinetics

membranes

protein structure

diabetes

obesity

non-alcoholic fatty liver disease

diabetic cardiomyopathy

adipose tissue

adipogenesis

insulin resistance

obesity

lipidomics

lipid metabolism

## **Education**

### **Post Graduate**

Postdoctoral Fellowship, Medical University of South Carolina, Charleston, SC,  
Biochemistry and Molecular Biology  
08/2001 - 05/2005

### **Graduate**

Vanderbilt University, Nashville, TN, **NOVEL PATHWAYS OF CYTOCHROME P450-MEDIATED ARACHIDONIC ACID BIOACTIVATION**, Jorge H. Capdevila.  
08/1995 - 12/2001

### **Undergraduate**

Furman University, Greenville, SC, Biology, B.S., 1995,  
08/1991 - 05/1995

## **Academic Appointment History**

Professor, tenure track, Virginia Commonwealth University College of Medicine  
11/2017 - Present

Associate Professor with tenure, Medical University of South Carolina College of Medicine  
01/2017 - 10/2017

Associate Professor, tenure track, Medical University of South Carolina College of Medicine  
07/2014 - 12/2016

Assistant Professor, tenure track, Medical University of South Carolina College of Medicine  
06/2009 - 06/2014

Assistant Professor, research track, Medical University of South Carolina College of Medicine  
07/2005 - 05/2009

## **Employment History**

Research Health Scientist, McGuire Veterans Affairs Medical Center  
11/2017 - Present

Director, Lipidomics Shared Resource Facility, Virginia Commonwealth University College of Medicine  
02/2018 (in progress)

Research Health Scientist, Ralph H. Johnson Veterans Affairs Medical Center  
05/2005 - 10/2017

Director, Lipidomics Pilot Project Program, Medical University of South Carolina College  
of Medicine  
2014 - 2017

Co-Director, Center of Biomedical Research Excellence in Lipidomics and Pathobiology,  
Medical University of South Carolina  
2014 - 2017

### **Special Awards & Honors**

Mencius Lectureship, Qingdao University, Qingdao, China  
04/2018

Keynote Speaker, International Ceramide Conference, Port Jefferson, NY  
05/2017

Developing Scholar Award, Medical University of South Carolina. Recently appointed  
assistant professors from across all colleges and departments were nominated by  
department chairs within the university. Letters of support were received by Provost's  
level awards committee who made the selection of 3 faculty based upon established  
criteria and strength of evidence.  
2011

NIH Ruth L. Kirschstein National Research Service Award Individual Postdoctoral  
Fellowship (F32)  
2002

Award for Outstanding Research, Furman University Biology Department  
1995

National Merit Finalist  
1991

### **Society Memberships**

2017-Present	American Heart Association	Member
2017- Present	American Diabetes Association	Regular Member
2013 – Present	Biochemical Society	Member
2012-Present	Society for Heart and Vascular Metabolism	Member
2010-11	American Society for Biochemistry and Molecular Biology, Lipid Research Division	Founding Member
2005 - Present	American Society for Biochemistry and Molecular Biology	Regular Member

### **Scholarly Activities**

#### **Expert Services**

### **Editorial board positions:**

2017- Present	Frontiers in Cardiovascular Medicine	Editorial Board
2013 - Present	PLoS One	Associate Editor
2013 - Present	Journal of Lipid Research	Editorial Board
2013 - Present	Biochemical Journal	Editorial Advisory Board

### **Study section memberships:**

2018	ad hoc reviewer	Univ. of Alabama Birmingham NIDDK Nutrition and obesity research center
2017	ad hoc reviewer	NIH/NCATS UG3/UH3 Industry Program (X02)
2016-2019	<u>Permanent Member</u>	NIH Myocardial Ischemia and Metabolism (MIM)
2016	Temporary Member, Winter Cycle	NIH Myocardial Ischemia and Metabolism (MIM)
2015 (BBM)	Temporary member, Winter, Summer, and Fall review cycles	NIH Biochemistry and Biophysics of Membranes
2015	ad hoc grant review	Israel Science Foundation
2015	ad hoc grant review	UNC Chapel Hill Nutrition Obesity Research Center
2014 (BBM)	ad hoc grant review	NIH Biochemistry and Biophysics of Membranes
2013	ad hoc grant review	NIH Special Emphasis Panel ZDK1 GRB-D (M1)
2013	ad hoc grant review	Austrian Science Foundation
2012-13	ad hoc grant review	Michigan Diabetes Research and Training Center
2012	ad hoc grant review	Research Council KU Leuven
2011	ad hoc grant review	Duke-NUS Star collaboration pilot projects
2011	ad hoc grant review	National Science Foundation

### **Organizing roles in scientific meetings:**

#### Organizer:

2019	Meeting Organizer	International Ceramide Conference, Lisbon, Portugal
2018	Meeting Organizer	Society for Heart and Vascular Metabolism, to be held in Charleston, SC
2010	Chair and Organizer	44th Annual Southeastern Regional Lipid Conference, Cashiers, NC

#### Session Chair/Discussion Leader:

2018	Session Moderator	American Heart Association-Basic Cardiovascular Sciences, San Antonio, Texas
2018	Discussion leader	Gordon Research Conference in Glycolipid and Sphingolipid Biology, Galveston, Texas

2017	Session Moderator	American Heart Association-Basic Cardiovascular Sciences, Portland, Oregon
2017	Session Chair	Keystone Meeting in Lipidomics and Bioactive lipids in Metabolism and Disease, Tahoe City, California
2016	Session Chair	Society for Heart and Vascular Metabolism, Beijing, China
2016	Discussion Leader	Gordon Research Conference in Glycolipid and Sphingolipid Biology, Il Ciocco, Italy
2015	Session Chair	International Ceramide Conference, Izmir, Turkey
2013	Session Chair	Society for Heart and Vascular Metabolism, Cambridge, Maryland
2013	Panelist	Society For Heart and Vascular Metabolism, Cambridge, Maryland
2011	Session Chair	Charleston Ceramide Conference, Villars, Switzerland
2010	Session Chair	Gordon Research Conference on Glycolipid and Sphingolipid Biology, Ventura, California
2007 - 2008	Session Chair	Southeastern Regional Lipid Conference, Cashiers, North Carolina

### **Journal refereeing:**

Ad hoc for journals including Cell Reports, PNAS, Nature Medicine, Molecular Cell, J. Biol. Chem., FASEB J., Diabetes, Hepatology, J. Lipid Research, Lipids, PLoS One, PLoS Genetics, Biochem. J., Am. J. Physiology, Circulation Research, Biochimica Biophysica Acta, J. Clin. Lipidology, Cancer Research, and others. Approximately 4/month.

### **Grants and Contracts: Active**

2017 - 2021	Veteran's Affairs	\$1,189,300 total
5/8ths		

2I0BX000200

Sphingolipids in the Pathophysiology of Obesity and Diabetes  
Cowart, PI

2014-2019	NIH/NHLBI	\$1,862,500
total	30%	

1R01HL117233

Sphingolipids in Diabetic Cardiomyopathy  
Cowart, PI

5/1/17-4/30/22	NIH/NCI
20%	

5P30CA016059-37

VCU Massey Cancer Center Support grant  
Ginder, PI  
Cowart, Lipidomics Core Director

1 R13 HL144011 (PI: Cowart) 08/01/2018 –  
07/31/2019 0 calendar  
NIH/NHLBI  
\$10,300

Society for Heart and Vascular Metabolism, 16th Annual Meeting  
This grant provides funding for a scientific meeting  
Cowart, PI  
2017 - 05/2017

### **Grants and Contracts: Pending**

02/01/2019 - 01/31/2020 NIH \$776,938 (Direct)  
1 S10 OD026815-01

NIH High End Instrumentation Grant Thermo-Fisher Q Exactive HF for Lipidomics and  
Metabolomics Research  
COWART, LAUREN ASHLEY (PD/PI)  
Pending IRG Review  
This grant will fund purchase of a new instrument for the VCU Lipidomics and  
Metabolomics Core Facility  
02/2019 - 06/2019

### **Grants and Contracts: Past**

2013 - 2017 Veteran's  
Affairs \$1,143,300 8/8ths\*  
1I01BX000200-01

Sphingolipids in the Pathophysiology of Obesity and Diabetes-  
Cowart, PI

2009 - 2013 Veteran's  
Affairs \$891,900 8/8ths\*  
1I01BX000200-01

Sphingolipid-Mediated Skeletal Muscle Pathology in Response to Free Fatty Acids  
Cowart, PI

2005 - 2008 Veteran's Affairs Merit  
Review \$402,500 8/8ths\*  
Entry Program

The Role of Sphingolipids in Free Fatty Acid-Induced Insulin Resistance  
Cowart, PI

\*The Medical University of South Carolina and the Ralph H. Johnson VA Medical Center  
have an agreement that effort for faculty with dual appointments (MUSC and the VA) is

based on 1.5 FTE.

2002 - 2012	NIH/NCRR P20 RR017677- 06	\$10,950,000	50%
COBRE in Lipidomics and Pathobiology Obeid, PI/ Cowart, PI for Project 1 (\$125,000/yr direct)			
2002 - 2003	NIH/NIGMS F32 GM068270-01A1	\$47,296	100%
Sphingolipid-Dependent Transcriptional Responses to Heat Cowart, PI			

**Co-Investigator, past:**

2014- 2017	NIH/NIGMS 5P30GM103339-03	\$1,094,825/yr	10%
COBRE in Lipidomics and Pathobiology Ogretmen, PI			
2009 - 2010	NIH/NLM R01 LM010144-01	\$1,589,117	20%
Statistical Methods for Integromics Discoveries Co-investigator (Lu, PI) 2013 - 2010			

**Advising and Mentoring**

**Current Trainees:**

Anna Kovilakath, PhD Research Mentor, 50 hours per year, Research: Atypical sphingolipids in diabetic cardiomyopathy  
Maryam Jamil, PhD Research Mentor, 50 hours per year, Research: Lipid signaling in non-alcoholic fatty liver disease  
Yolander Valentine, PhD Research Mentor, 50 hours per year, Research: Lipid signaling in adipose tissue ER stress  
Johana Lambert, PhD Research Mentor, 50 hours per year, Research: Lipid signaling in adipogenesis  
Andrea Anderson, PhD Research Mentor, 50 hours per year, Research: Lipid signaling in circadian clock regulation  
William Hancock, PhD, Postdoctoral Mentor, 40 hours per year, Research: Ceramides

and diabetic cardiomyopathy

David Montefusco, PhD, Junior Faculty Mentor, 20 hours per year, Research: Lipids in liver disease

### **Past Trainees:**

Michael Harland, Masters Thesis Mentor, 50 hours per year, Research: Sphingosine Kinase in fatty liver disease. Masters Obtained May 2016.

Abigail Washispack, Masters Thesis Mentor, 50 hours per year, Research: Ceramides in diabetic cardiomyopathy. Masters Obtained December 2016.

Sarah B. Russo, MD/PhD Thesis mentor, 50 hours per year, Research: Ceramides in diabetic cardiomyopathy. MD/PhD obtained May 2018

Jessica Ross, PhD Thesis mentor, 50 hours per year, Research: Sphingosine Kinase in skeletal muscle. PhD obtained May 2014

Brittany Law, PhD. Postdoctoral Mentor, 40 hours per year, Research: Ceramides in mitophagy.

Tuoyu Geng, PhD. Postdoctoral Mentor, 20 hours per year, Research: Dietary fat composition and diabetes

Wei Hu, MD. Postdoctoral Mentor, 20 hours per year. Research: Sphingolipid functions and regulation in insulin resistance

Tamara Knowing, PhD, Junior Faculty Mentor, 5 hours per year. Research: Sphingolipids in Lupus Nephritis

Ying Xiong, PhD, Junior Faculty Mentor, 3. hours per year. Research: Bone marrow stem cell-derived adipocytes

Seok Hyung Kim, PhD, Junior Faculty Mentor, 10 hours per year. Research: Zebrafish models of non-alcoholic fatty liver disease

Catrina Robinson, PhD, Junior Faculty Mentor, 5 hours per year. Research: Dietary fat and cognitive function

05/2016 - 05/2014

## **Presentations**

### **Invited**

#### **Internal/VCU**

Virginia Commonwealth University, 2018, Host: Dr. Clive Baumgartner, Pharmacology and Toxicology Departmental Seminar Series  
2018

#### **Local/Regional (Virginia but Non-VCU)**

University of Virginia, May 2016, Host: Drs. Ken Hsu and Kevin Lynch  
05/2016

### **National**

#### **Invited Seminars:**

University of Missouri, September 2018, Host: Dr. Christopher Baines

University of Kentucky, November 11, 2017, Host: Dr. Mariana Nikolova-Karakashian



East Carolina University, October 4, 2017, Host: Dr. Myles Cabot  
Virginia Commonwealth University, April 2017, Host: Dr. Charles Chalfant  
University of Louisville, January 2017, Host: Dr. Yi Tan  
University of Texas, Southwestern, December 2015, Host: Dr. Will Holland  
University of Alabama Birmingham, September 2015, Host: Dr. Adam Wende  
Washington University, June 2015, Host: Dr. Jean Schaffer  
Sanford-Burnham Research Institute, December 2014, Hosts: Drs. Bret Goodpaster and Paul Coen  
Clemson University Department of Biological Sciences, November 2014, Host: Dr. Kimberly Paul  
University of Iowa Diabetes Research Center, November 2014, Host: Dr. E. Dale Abel  
University of St. Louis, Cardiovascular Center, September 2014, Host: Dr. David Ford  
National Institute of Alcohol Abuse and Alcoholism –2012, Host: Dr. George Kunos  
University of Pittsburgh, 2012, Host: Dr. Brett Goodpaster, PhD  
Clemson University Genetics and Biochemistry Club, 2011, Host: Ms. Krutika Mediwala  
Sodexo Clinical Update, Medical University of South Carolina, Charleston, SC, 2011  
University of South Carolina Graduate Studies, 2011, Host: Dr. Wayne Carver  
Georgia Health Sciences University Department of Physiology, 2010 Host: Dr. Wendy Bollag  
Clemson University Department of Genetics and Biochemistry, 2010, Host: Dr. Alex Feltus  
Dalhousie University Department of Biochemistry, Halifax, Canada, 2010, Host: Christopher McMaster  
UCSF Department of Dermatology, San Francisco, CA, 2006, Host: Walt Holleran, PhD  
Vanderbilt University Clinical Pharmacology, 2005, Host: Jason Morrow, MD

### **Invited Presentations at Conferences:**

Mini Symposium on Aberrant Lipid Metabolism/Signaling in Aging and Disease".  
University of Texas San Antonio, December 2018  
Keynote lecture, International Ceramide Conference, Port Jefferson, NY, May 2017  
Keystone Meeting in Lipidomics and Bioactive Lipids in Metabolism and Disease 2017.  
Chair: Sarah Spiegel, Alfred Merrill  
ASBMB/Experimental Biology, 2014, San Diego, CA, Chair: Marion Sewer, Ph.D.  
Lipids 2016. October 2016 Session chair: George Kokotos  
ASBMB/Experimental Biology, April 2014, San Diego, CA, Chair, Besim Ogretmen Ph.D.  
Gordon Conference on Glycolipid and Sphingolipid Metabolism, January 2014, Ventura, CA, chair: Walter Holleran, Ph.D.  
World Congress on "Exercise is Medicine", and World Congress on Inflammation in Exercise, Health, and Disease. Annual Conference of the American College of Sports Medicine, May 2014, Orlando, FL, Session: Sphingolipids in Skeletal Muscle, Chair, John Quindry, Ph.D.  
Southeast Lipid Research Conference, Callaway Gardens, GA, September 2013, Chair: John Parks, Ph.D.  
World Congress on "Exercise is Medicine", Annual Conference of the American College of Sports Medicine, Indianapolis, IN, May 2013 Session: Molecular Mechanisms of Lipotoxicity in Multiple Organs, Chair, Michael Reid, Ph.D.  
ASBMB/Experimental Biology, April 2013, Boston, MA, Chair: Besim Ogretmen, Ph.D.

FASEB Summer Research Conference on Phospholipid Metabolism, July 2012, Saxton's River, VT, Chair: Vytas Bankaitis, Ph.D.  
FASEB Summer Research Conference on Phospholipid Metabolism, June 2010, Steamboat Springs, CO, Chair, Alex Brown, Ph.D.  
2005

## **International**

### **Invited Seminar:**

Mencius Lectureship, 2018 Qingdao University, Qingdao, China, Host: Dr. Peifeng Li

### **Invited Presentations at Conferences:**

4th Conference on the Molecular Medicine of Sphingolipids, Rehovot, Israel October 2018

Bioactive Lipids 2018, Athens, Greece

Society for Heart and Vascular Metabolism, Sanofi-sponsored satellite, October 2016, Beijing, China. Chair: Xiao-Wei Chen

International Ceramide Conference, Izmir, Turkey, May 2015. Chair, Besim Ogretmen, PhD

EMBO Molecular Medicine, Bad Staffelstein, Germany, October 2014. Chair, Erich Gulbins, Ph.D  
2018

## **Teaching Experience**

### **Didactic and Clinical**

### **MEDICAL UNIVERSITY OF SOUTH CAROLINA**

#### **Major teaching activities:**

COLLEGE of GRADUATE STUDIES:

2012, 2014, 2016	Lipids in Pathobiology (BMB748)
2015	Molecular Basis of Cardiovascular Disease
2013 Syndrome (BMB605D)	Selective in Obesity, Diabetes, and the Metabolic
2013	Advanced Cell Biology (MCBP723)
2012	General and Systemic Pathology
2009-2012	Nucleic Acids Unit of the FYC, COGS
2008-2012 students)	Week 3, Summer Refresher Course (entering PhD

2008 Selective in Aging (BMB605A)

COLLEGE of MEDICINE:

2009-2015 Physiology of Aging

2012-2016 Cholesterol Metabolism, Lipoprotein Transport (4  
lecture hours total)

**Course Design, Development, and Directing:**

<b>Year</b>	<b>Course</b>
2014 Course (BMB735)	Participated in Developing the upper-level Biochemistry
2012-2016	Developed and Co-directed Lipids in Pathobiology (BMB748)
2013 the Metabolic	Developed and directed Selective in Obesity, Diabetes, and Syndrome (BMB605D)
2013 of Medicine MD yr. 1	Developed "Physiology of Aging" lecture content for College
2010 – 2012	Director, Nucleic Acids Unit of the First-Year Curriculum, College of Graduate Studies
2008	Developed and directed Selective in Aging (BMB605A) College of Graduate Studies
2012 - 2008	

**Service Activities**

**Service to the Profession**

**Medical University of South Carolina:**

University-Level Committees

2017 Medicine/Oral Health Sciences	Search Committee for Chair of Oral Health Sciences	Member	Dental
2015-2017 resource	Lipidomics shared Member MUSC/Hollings Cancer Center		

	internal advisory committee		
2017	Gene Function Core Internal Advisory Board	Member	MUSC
2017 Cancer Center	Hollings Cancer Center T32  mentoring committee	Member	Hollings
2014-2017 South Carolina Clinical and Translational Research Institute	Scientific Review Committee	Member	MUSC

#### College-Level Committees

2017 College of Medicine	Strategic Plan Committee- Metabolic and Digestive Disease	Member	MUSC
2016-2017 College of Medicine	Bridge Funding Committee	Member	MUSC
2016 College of Medicine	University Gene Function Core restructuring committee	Member	MUSC
2016-P2017 College of Graduate Studies	First Year Graduate Student Advisory Committee	Member	MUSC
2015-2017 College of Graduate Studies	Credential Committee	Member	MUSC
2014-2017 College of Medicine	Infrastructure Committee	Member	MUSC
2014 College of Medicine	Medical School LCME Re-accreditation committee	Member	MUSC
2009 - 2013 College of Graduate Studies	Graduate Admissions Committee	Member	MUSC

## Department-Level Committees

2014-2017 Department of Biochemistry Molecular Biology	Appointments, Promotions, and Tenure committee	Member	MUSC and
2014-2015 Department of Medicine, of Cardiology	Search Committee for Chief of Cardiology	Member	MUSC Division
2014-present Department of Biochemistry d Molecular Biology	External Seminar series coordinator		MUSC an
2013-15 Department of Biochemistry Molecular Biology	Search Committee Faculty Recruitment	Member	MUSC and
2013-15 Department of Biochemistry Molecular Biology	Search Committee COEE Endowed Chair in Structural Biology	Member	MUSC and
2008 – Present Department of Biochemistry d Molecular Biology	Graduate Training Committee	Member	MUSC an

## Virginia Commonwealth University:

2018- Interviewer	VCU School of Medicine	Admissions
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## **Service to the Community**

2017 “Beer with a Scientist”, Presentation to the Lay public, Against the Grain Brewery, Louisville, KY, sponsored by University of Louisville

2015-2017 Editor of the “Buist Banner”, a bi-annual publication of the Buist Academic Magnet Academy Foundation Board  
2015-2017. Buist Academic Magnet Academy Foundation Board  
2015 Buist Academic Magnet Academy Science Project Leader  
2011 Academic Magnet High School Science Fair Judge

2017 - 2011

## Service to the University

2018-                      Director, Virginia Commonwealth University Lipidomics and  
Metabolomics Core  
2018

## Service to the School of Medicine

2018-                      VCU School of Medicine                      Admissions  
Interviewer

## Service to other Affiliated Institutions

### Local Veterans' Affairs service:

2018-                      IACUC Committee                      Member                      Hunter  
Holmes McGuire VAMC

2018-                      Biosafety Committee  
Member                      Hunter Holmes McGuire VAMC

2015-2017                      Research and Development                      Member                      Ralph  
H. Johnson VAMC  
Committee

2009-2017                      Biosafety Committee                      Member                      Ralph  
H. Johnson VAMC  
2018 - 2017

## Publications

### Papers Published in Peer Reviewed Journals

1. Montefusco DJ, Allegood JC, Spiegel S, **Cowart LA**. Non-alcoholic fatty liver disease: Insights from sphingolipidomics. *Biochem Biophys Res Commun*. 2018 May 21 [Epub ahead of print]. [PMID: 29778532](#).

Choi S, Snider JM, Olakkengil N, Lambert JM, Anderson AK, Ross-Evans JS, **Cowart LA**, Snider AJ. Myristate-induced endoplasmic reticulum stress requires ceramide synthases 5/6 and generation of C14-ceramide in intestinal epithelial cells. *FASEB J*. 2018 May 16:fj201800141R [Epub ahead of print]. [PMID: 29768040](#).

Jin J, Lu Z, Li Y, **Cowart LA**, Lopes-Virella MF, Huang Y. Docosahexaenoic acid antagonizes the boosting effect of palmitic acid on LPS inflammatory signaling by inhibiting gene transcription and ceramide synthesis. *PLoS One*. 2018 Feb 23;13(2):e0193343. [PMC5825094](#).

Law BA, Liao X, Moore KS, Southard A, Roddy P, Ji R, Szulc Z, Bielawska A, Schulze PC, **Cowart LA**. Lipotoxic very-long-chain ceramides cause mitochondrial dysfunction, oxidative stress, and cell death in cardiomyocytes. *FASEB J*.2018 Mar;32(3):1403-1416. [PMC5892719](#).

Xiong Y, Russell DL, McDonald LT, **Cowart LA**, LaRue AC. Hematopoietic Stem Cell-derived Adipocytes Promote Tumor Growth and Cancer Cell Migration. *Int J Cancer Res Mol Mech*.2017;3(1). [PMC5627654](#).

Jadhav S, Russo S, **Cowart LA**, Greenberg ML. Inositol Depletion Induced by Acute Treatment of the Bipolar Disorder Drug Valproate Increases Levels of Phytosphingosine. *J Biol Chem*. 2017 Mar 24;292(12):4953-4959. [PMC5377808](#).

Klionsky DJ, et al. Guidelines for the use and interpretation of assays for monitoring autophagy (3rd edition). *Autophagy*.2016;12(1):1-222. [PMC4835977](#).

Jadhav S, Russo S, Cottier S, Schneider R, Cowart A, Greenberg ML. Valproate Induces the Unfolded Protein Response by Increasing Ceramide Levels. *J Biol Chem*. 2016 Oct 14;291(42):22253-22261. [PMC5064004](#).

Sutter AG, Palanisamy AP, Lench JH, Eskilsen S, Geng T, Lewin DN, **Cowart LA**, Chavin KD. Dietary Saturated Fat Promotes Development of Hepatic Inflammation Through Toll-Like Receptor 4 in Mice. *J Cell Biochem*. 2016 Jul;117(7):1613-21. [PMC6032519](#).

Geng T, Sutter A, Harland MD, Law BA, Ross JS, Lewin D, Palanisamy A, Russo SB, Chavin KD, **Cowart LA**. SphK1 mediates hepatic inflammation in a mouse model of NASH induced by high saturated fat feeding and initiates proinflammatory signaling in hepatocytes. *J Lipid Res*.2015 Dec;56(12):2359-71. [PMC4655991](#).

Geng T, Xia L, Russo S, Kamara D, **Cowart LA**. Prosteatotic genes are associated with unsaturated fat suppression of saturated fat-induced hepatic steatosis in C57BL/6 mice. *Nutr Res*.2015 Sep;35(9):812-22. [PMC5520982](#).

Khakhina S, Johnson SS, Manoharlal R, Russo SB, Blugeon C, Lemoine S, Sunshine AB, Dunham MJ, **Cowart LA**, Devaux F, Moya-Rowley WS. Control of Plasma Membrane Permeability by ABC Transporters. *Eukaryot Cell*.2015 May;14(5):442-53. [PMC4421010](#).

Jaishy B, Zhang Q, Chung HS, Riehle C, Soto J, Jenkins S, Abel P, **Cowart LA**, Van Eyk JE, Abel ED. Lipid-induced NOX2 activation inhibits autophagic flux by impairing lysosomal enzyme activity. *J Lipid Res*.2015 Mar;56(3):546-61. [PMC4340303](#).

Rachidi S, Sun S, Wu BX, Jones E, Drake RR, Ogretmen B, **Cowart LA**, Clarke CJ, Hannun YA, Chiosis G, Liu B, Li Z. Endoplasmic reticulum heat shock protein gp96 maintains liver homeostasis and promotes hepatocellular carcinogenesis. *J Hepatol*. 2015 Apr;62(4):879-88. [PMC4369194](#).

Ross JS, Russo SB, Chavis GC, **Cowart LA**. Sphingolipid regulators of cellular dysfunction in Type 2 diabetes mellitus: a systems overview. *Clin Lipidol*.2014;9(5):553-569. [PMC5891157](#).

Jin J, Zhang X, Lu Z, Perry DM, Li Y, Russo SB, **Cowart LA**, Hannun YA, Huang Y. Acid sphingomyelinase plays a key role in palmitic acid-amplified inflammatory signaling triggered by lipopolysaccharide at low concentrations in macrophages. *Am J Physiol Endocrinol Metab*.2013 Oct 1;305(7):E853-67. [PMC3798699](#).

Geng T, Hu W, Broadwater MH, Snider JM, Bielawski J, Russo SB, Schwacke JH, Ross J, **Cowart LA**. Fatty acids differentially regulate insulin resistance through endoplasmic reticulum stress-mediated induction of tribbles homologue 3: a potential link between dietary fat composition and the pathophysiological outcomes of obesity. *Diabetologia*.2013 Sep;56(9):2078-87. [PMID: 23820633](#).

Ross JS, Hu W, Rosen B, Snider AJ, Obeid LM, **Cowart LA**. Sphingosine kinase 1 is regulated by peroxisome proliferator-activated receptor  $\alpha$  in response to free fatty acids and is essential for skeletal muscle interleukin-6 production and signaling in diet-induced obesity. *J Biol Chem*.2013 Aug 2;288(31):22193-206. [PMC3829312](#).

Lu S, Jin B, **Cowart LA**, Lu X. From data towards knowledge: revealing the architecture of signaling systems by unifying knowledge mining and data mining of systematic perturbation data. *PLoS One*.2013 Apr 23;8(4):e61134. [PMC3634064](#).

LeBlanc MA, Fairn GD, Russo SB, Czyz O, Zarembek V, **Cowart LA**, McMaster CR. The yeast oxysterol binding protein Kes1 maintains sphingolipid levels. *PLoS One*.2013 Apr 4;8(4):e60485. [PMC3617146](#).

Russo SB, Ross JS, **Cowart LA**. Sphingolipids in obesity, type 2 diabetes, and metabolic disease. *Handb Exp Pharmacol*.2013;(216):373-401. [PMC4091661](#).

Russo SB, Tidhar R, Futerman AH, **Cowart LA**. Myristate-derived d16:0 sphingolipids constitute a cardiac sphingolipid pool with distinct synthetic routes and functional properties. *J Biol Chem*.2013 May 10;288(19):13397-409. [PMC3650378](#).

Richards AJ, Schwacke JH, Rohrer B, **Cowart LA**, Lu X. Revealing functionally coherent subsets using a spectral clustering and an information integration approach. *BMC Syst Biol*.2012;6 Suppl 3:S7. [PMC3542577](#).

Russo SB, Baicu CF, Van Laer A, Geng T, Kasiganesan H, Zile MR, **Cowart LA**. Ceramide synthase 5 mediates lipid-induced autophagy and hypertrophy in cardiomyocytes. *J Clin Invest*.2012 Nov;122(11):3919-30. [PMC3484448](#).

Montefusco DJ, Newcomb B, Gandy JL, Brice SE, Matmati N, **Cowart LA**, Hannun YA. Sphingoid bases and the serine catabolic enzyme CHA1 define a novel feedforward/feedback mechanism in the response to serine availability. *J Biol Chem*.2012 Mar 16;287(12):9280-9. [PMC3308826](#).



Brice SE, **Cowart LA**. Sphingolipid metabolism and analysis in metabolic disease. *Adv Exp Med Biol*.2011;721:1-17. [PMID: 21910079](#).

Hu W, Ross J, Geng T, Brice SE, **Cowart LA**. Differential regulation of dihydroceramide desaturase by palmitate versus monounsaturated fatty acids: implications for insulin resistance. *J Biol Chem*.2011 May 13;286(19):16596-605. [PMC3089502](#).

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## 2. Special Recognition for Peer-Reviewed Manuscripts

2016 MUSC EurekAlert article for Geng et al. 2015b

2012 Faculty of 1000 Review for Hu et al., 2011, *J. Biol. Chem.*

2012 Editorial on Hu et al., 2011, *J. Biol. Chem.* on the Nature Lipidomics Gateway

2012 Article on Russo et al., 2012, *J. Clin. Invest. SciBX*, a journal from *Science* that promotes collaborations between Academic and Industry Scientists

2011 Article in *The Catalyst* (MUSC Newspaper) for Hu et al., 2011, *J. Biol. Chem.*

## **Editorials, Reviews, Commentaries, Proceedings, Invited Published Papers in Peer Reviewed Journals**

### 1. Literature Reviews

Spiegel and Cowart, in preparation. Sphingolipids in metabolic disease: the good, the bad, and the ugly. *Cell Metab.*, in preparation

Lambert, J, Anderson, A, Cowart, LA, submitted. Sphingolipids in Adipose Tissue: What's tipping the Scale? *Adv. in Biol. Reg.* Eds: Brian Wattenberg and Sarah Spiegel

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#### Editorial Comment

**Cowart, L. A.** (2010) A novel role for sphingolipid metabolism in oxidant-mediated skeletal muscle fatigue. Focus on "Sphingomyelinase stimulates oxidant signaling to weaken skeletal muscle and promote fatigue". **Am J Physiol-Cell Physiol.**, 299, C549-551

### **Books, Book Chapters and Monographs**

#### 1. Scholarly Books Edited

Cowart, L. Ashley, ed. (2011) Sphingolipid metabolism and analysis in metabolic disease. **Adv Exp Med Biol.** Volume 721, Springer-Verlag

#### Chapters in Scholarly Books

Brice, SE, Ross, J, and Cowart LA (2013) Roles of Sphingolipids in Metabolic Disease. In **Sphingolipids in Health and Disease, Handbook of Experimental Pharmacology**, Springer-Verlag, Erich Gulbins, Ed.

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In **Handbook of Cell Signaling**, Bradshaw, R. A., Dennis, E. A., eds. Academic Press

### **Scholarly Work Published in other Media**

#### **Non-Peer Reviewed**

#### Non-Peer Reviewed Publications

**Cowart, LA.** (2011) Fatty Acid-Mediated Regulation of Sphingolipid Metabolism and its role in Lipotoxicity. **ASBMB TODAY** Lipid Corner, Dan Raben, editor, found in print and online at [http://www.asbmb.org/asbmbtoday/asbmbtoday\\_article.aspx?id=11740](http://www.asbmb.org/asbmbtoday/asbmbtoday_article.aspx?id=11740) 2011

## **Personal Statement**

The historical focus of my research has been the metabolism and signaling of bioactive lipids. My graduate work addressed metabolism and functions of eicosanoids, a class of lipids regulating inflammation, vascular tone, ion fluxes, and many other cell functions. During this time I also gained expertise in techniques used for the identification and quantification of lipids. My postdoctoral studies addressed metabolism and functions of sphingolipids in the model organism *S. cerevisiae*. In addition to building upon my basic biochemistry knowledge and skill set, during this time I also developed and employed novel computational strategies to understand the regulation of sphingolipid metabolism and its functions using data from the emerging field of lipidomics and (at that time) novel microarray strategies for quantifying mRNA expression. With bioinformaticians I developed novel methods to integrate disparate types of large data sets (genomics, lipidomics, and others) to extract biological information and form novel hypotheses. My independent career began in 2005 with procurement of my first independent funding and subsequent promotion to a junior faculty position. This work used similar approaches and paradigms as my previous work, but addressed the serious human health problem of diabetes, obesity, and the metabolic disease. My first independent publications as senior author established novel roles for regulation of sphingolipid metabolism and addressed new biological activities of sphingolipids including sphingosine-1-phosphate in skeletal muscle inflammation. From those early studies my laboratory has developed innovative and extramurally funded research programs in diabetic cardiomyopathy (NIH R01) and adipose tissue biology (VA Merit). In 2017 I was recruited to Virginia Commonwealth University, where we are continuing these projects with the aid of new expert collaborators.

Additionally we are expanding our work in liver with expert collaborators at VCU, and we are pursuing extramural funding for this growing work. My laboratory has relied heavily on lipidomics approaches to inform and deepen our understanding in pathological changes in lipid profiles that correspond to and regulate deleterious cell processes in the obese context. This has served as a nice for our research, and therefore I am currently recognized as a leader in this area as evidenced by numerous invited lectures and conference presentations, in addition to invited reviews. In addition to my experimental and scientific expertise in the area of lipidomics, at my former institution I was also heavily administratively involved in the Medical University of South Carolina Lipidomics Core Facility, the first fee-for-service lipidomics facility in the United States. Upon recruitment to VCU I then rose to the position of director of the VCU Lipidomics and Metabolomics Core. In that capacity I have applied for funding (NIH S10 instrumentation grant, State of Virginia HEETF) to expand our instrumentation in a manner that will broaden the scope of our metabolomics capabilities. I am also greatly increasing the user base of this facility to ensure its financial sustainability for the future. My overall career goal is to continue to grow our understanding of bioactive lipids and disease, to further the implementation of "big data" approaches for biological discovery by my own research group and to assist other groups in doing so, and to serve the VCU community as Lipidomics core director, as a mentor for trainees, and in any other ways possible.

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