

KyMBERly M. Gowdy, MS, PhD

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Greenville, NC 27834-4354
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Education

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| 2011-2014 | Postdoctoral Fellowship
National Institute of Environmental Health Sciences (NIEHS)
Laboratory of Respiratory Biology |
| 2008-2011 | Postdoctoral Researcher
Duke University Medical Center
Division of Pulmonary, Allergy, and Critical Care, Department of Medicine |
| 2004-2008 | Doctor of Philosophy
North Carolina State University, Raleigh, NC
Major: Immunology with a minor in Toxicology; Dissertation: Increased susceptibility and severity of influenza infection in mice exposed to diesel exhaust. |
| 2001-2004 | Master of Science
North Carolina State University, Raleigh, NC
Major: Immunology and Poultry Science; Thesis: Selenium Supplementation and Antioxidant Protection in Broiler Chickens. |
| 1997-2001 | Bachelor of Science
Virginia Tech, Blacksburg, VA
Major: Animal Science; Minor: Chemistry |

Academic and Professional Experience

- 11/14-present Assistant Professor, East Carolina University
- ♦ Department of Pharmacology and Toxicology, Brody School of Medicine
 - ♦ Laboratory is focused on the role of scavenger receptors in environmental lung diseases, both infectious and inflammatory.
- 5/11-11/14 Postdoctoral Fellow, National Institute of Environmental Health Sciences
- ♦ Mentor: Dr. Michael B. Fessler, Laboratory of Respiratory Biology, Host Defense group, Principal Investigator and group leader.
 - ♦ Elucidated a novel role for scavenger receptor BI (SR-BI), multi-recognition receptor mostly studied in the arena of atherosclerosis, in pulmonary host defense and allergic asthma.
 - ♦ Successfully wrote a NIAID K22 entitled "Role of Scavenger Receptor BI in innate immunity during bacterial pneumonia" submitted November 12, 2013. Score: 28
 - ♦ Co-chaired the annual Biomedical Career fair at NIEHS, an event that has more than 300 attendees, a budget of \$25,000, and approximately 45 local and out of town speakers on careers in the biomedical sciences.

- 8/08-5/11 Postdoctoral Fellow, Duke University Medical Center
- ◆ Mentor: Dr. Scott M. Palmer, Division of Pulmonary, Allergy, and Critical Care, Lung Transplant group, Principal Investigator and Scientific Director of Lung Transplant Program.
 - ◆ Investigated the T cell function in pulmonary graft versus host disease. Discovered a novel role for surfactant protein A in protecting against gastrointestinal graft versus host disease and polarizing naïve T cells towards a regulatory phenotype as well as CD8⁺ T cell dysfunction in the lung after allogeneic bone marrow transplantation.
 - ◆ Successfully wrote an F32 entitled “Role of Surfactant Protein A in Gastrointestinal Graft Versus Host Disease.”
- 5/04-8/08 Graduate Research Associate, North Carolina State University, Department of Molecular Biomedical Sciences, Immunology Program, Raleigh, NC
- ◆ Mentors: Dr. M. Ian Gilmour and Dr. Susan Tonkonogy under the cooperative grant between the US Environmental Protection Agency and North Carolina State University.
 - ◆ Investigated how air pollutants such as diesel exhaust can alter the innate and adaptive immune response by decreasing production of lung collectins and polarizing towards a Th2 phenotype to pulmonary pathogens thus delaying clearance (Ph.D. thesis project).
- 8/01-5/04 Graduate Research Associate, North Carolina State University, Department of Poultry Science, Raleigh, NC
- ◆ Mentor: Dr. Frank W. Edens, Full professor in Poultry Science.
 - ◆ Determined that selenium supplementation affects antioxidant enzyme activity and immune response to pathogens in broiler chickens (M.S. thesis project).
 - ◆ Master’s thesis received the M.B. “Dutch” Gardner award

Awards and Honors

- ◆ Career Development Award, Center for Human Health and the Environment, 2015
- ◆ Walter A. Rosenblith New Investigator Award, Heath Effects Institute, 2015
- ◆ 2nd Place, Visiting Pulmonary Scholar Research Poster Competition, Chapel Hill, NC, 2014.
- ◆ 1st Place, Visiting Pulmonary Scholar Research Poster Competition, Chapel Hill, NC, 2013.
- ◆ Best Research Poster in Science Day Competition, NIEHS, RTP, NC, 2012.
- ◆ 2nd Place, Visiting Pulmonary Scholar Research Poster Competition, Chapel Hill, NC, 2011.
- ◆ Training Program in Pulmonary Clinical Research Grant Recipient, SCCOR Program- Host Factors in Chronic Lung Diseases, 2009.
- ◆ American Society of Transplantation Travel Award, Dallas, TX, 2008.
- ◆ Inhalation Toxicology Specialty Section Student Award, Society of Toxicology Annual Meeting, Charlotte, NC, 2007.
- ◆ Society of Toxicology Travel Award, Charlotte, NC, 2007.
- ◆ Best research poster award, North Carolina Society of Toxicology, RTP, NC, 2007.
- ◆ M. B. "Dutch" Gardner Outstanding Graduate Student Award for the best Master’s Thesis benefiting the poultry industry, 2004.

Professional Society Memberships

- ◆ 2011-Present American Thoracic Society
- ◆ 2010-2011 International Society of Heart and Lung Transplant
- ◆ 2008-2011 American Society of Transplantation
- ◆ 2007- Present North Carolina Chapter of the Society of Toxicology
- ◆ 2007-Present Society of Toxicology (SOT)
- ◆ 2006-Present American Association of Immunologists
- ◆ 1999-2004 Alpha Chi Sigma (Professional Chemistry Fraternity)

Publications

Journal articles:

Thompson LC, Holland NA, Snyder RJ, Luo B, Becak DP, Odom JT, Harrison BS, Brown JM, **Gowdy KM**, Wingard CJ. Pulmonary instillation of MWCNT increases lung permeability, decreases gp130 expression in the lungs, and initiates cardiovascular IL-6 transsignaling. *Am J Physiol Lung Cell Mol Physiol*. 2016 Jan 15;310(2):L142-54.

Whelan J, **Gowdy KM**, Shaikh SR. N-3 polyunsaturated fatty acids modulate B cell activity in pre-clinical models: Implications for the immune response to infections. *Eur J Pharmacol*. 2015 May 27. pii: S0014-2999(15)00465-3.

Gowdy KM, Madenspacher JH, Azzam KM, Aloor JJ, Fessler MB. Key role for Scavenger Receptor B-I in the integrative physiology of host defense during bacterial pneumonia. *Mucosal Immunology*. 2015 May;8(3):559-71.

Gowdy KM, Nugent JL, Manzo ND, Zhang HL, Kelly FL, Martinu T, Holtzman MJ, Palmer SM. Impaired CD8⁺ T cell immunity after allogeneic bone marrow transplantation leads to persistent and severe respiratory viral infection. *Transplant Immunology*. 2015 Jan;32(1):51-60.

Hsia, BJ, Whitehead, GS, Nakano K, **Gowdy KM**, Thomas, SY, Aloor, JJ, Nakano, H, Cook, DN. Trif-dependent induction of Th17 immunity by lung dendritic cells. *Mucosal Immunology*. 2015 Jan;8(1):186-97.

Martinu T, **Gowdy KM**, Nugent JL, Sun J, Lyes MA, Kinnier CV, Kelly FL, Foster WM, Gunn MD, Palmer SM. Role of CCL2 and CCR2 in murine chronic pulmonary graft-versus-host disease after lipopolysaccharide inhalations. *American Journal of Respiratory Cell and Molecular Biology*. 2014 Dec;51(6):810-21.

Gowdy KM, Fessler MB. Emerging roles for cholesterol and lipoproteins in lung disease. *Pulm Pharmacol Ther*. 2013 Aug;26(4):430-7.

Jaramillo R, Cohn RD, Crockett PW, **Gowdy KM**, Zeldin DC, Fessler MB. Reply. *J Allergy Clin Immunol*. 2013 Jun;131(6):1715-6.

Madenspacher JH, Azzam KM, **Gowdy KM**, Malcolm KC, Nick JA, Dixon D, Aloor JJ, Draper DW, Guardiola JJ, Shatz M, Menendez D, Lowe J, Lu J, Bushel P, Li L, Merrick BA, Resnick MA, Fessler MB. p53 integrates host defense and cell fate during bacterial pneumonia. *J Exp Med*. 2013 May 6;210(5):891-904.

Jaramillo R, Cohn RD, Crockett PW, **Gowdy KM**, Zeldin DC, Fessler MB. Relationship Between Objective Measures of Atopy and Myocardial Infarction in the United States. *J Allergy Clin Immunol*. 2013 Feb;131(2):405-11.

Madenspacher JH, Azzam KM, Gong W, **Gowdy KM**, Vitek MP, Laskowitz DT, Remaley AT, Wang JM, Fessler MB. Apolipoproteins and Apolipoprotein Mimetic Peptides Modulate Phagocyte Trafficking through Chemotactic Activity. *J Biol Chem*. 2012 Dec 21;287(52):43730-40.

Zhu X, Westcott MM, Bi X, Liu M, **Gowdy KM**, Seo J, Cao Q, Gebre AK, Fessler MB, Hiltbold EM, Parks JS. Myeloid Cell Specific ABCA1 Deletion Protects Mice From Bacterial Infection. *Circulation*. 2012, Nov 9;111(11):1398-409.

Draper DW, **Gowdy KM**, Madenspacher JH, Wilson RH, Whitehead GS, Nakano H, Pandiri AR, Foley JF, Remaley AT, Cook DN, Fessler MB. ATP binding cassette transporter G1 deletion induces IL-17-dependent dysregulation of pulmonary adaptive immunity. *J Immunol*. 2012 Jun 1;188(11):5327-36.

Gowdy KM, Cardona DM, Nugent JL, Giamberardino C, Thomas JM, Mukherjee S, Martinu T, Foster WM, Plevy SE, Pastva AM, Wright JR, Palmer SM. Novel role for surfactant protein A in gastrointestinal graft-versus-host disease. *J Immunol*. 2012 May 15;188(10):4897-905.

Mukherjee S, Giamberardino C, Thomas JM, **Gowdy K**, Pastva AM, Wright JR. Surfactant protein A modulates induction of regulatory T cells via TGF- β . *J Immunol*. 2012 May 1;188(9):4376-84.

Gowdy KM, Nugent JL, Martinu T, Potts E, Snyder LD, Foster WM, Palmer SM. Protective role of T-bet and Th1 cytokines in pulmonary graft-versus-host disease and peribronchiolar fibrosis. *Am J Respir Cell Mol Biol*. 2012 Feb;46(2):249-56.

Martinu T, Kinnier CV, **Gowdy KM**, Kelly FL, Snyder LD, Jiang D, Foster WM, Garantzotis S, Belperio JA, Noble PW, Palmer SM. Innate immune activation potentiates alloimmune lung disease independent of chemokine (C-X-C motif) receptor 3. *J Heart Lung Transplant*. 2011 Jun;30(6):717-25.

Kinnier CV, Martinu T, **Gowdy KM**, Nugent JL, Kelly FL, Palmer SM. Innate immune activation by the viral PAMP poly I:C potentiates pulmonary graft-versus-host disease after allogeneic hematopoietic cell transplant. *Transplant Immunology*. 2011 Jan 15;24(2):83-93.

Gowdy KM, QT Krantz, C King, E Boykin, I Jaspers, WP Linak, MI Gilmour. Role of Oxidative Stress on Diesel-Enhanced Influenza Infection in Mice. *Particle and Fibre Toxicology* 2010, Nov 22;7:34.

Gowdy KM, QT Krantz, M Daniels, WP Linak, I Jaspers, and MI Gilmour. Modulation of pulmonary inflammatory responses and antimicrobial defenses in mice exposed to diesel exhaust. *Toxicology and Applied Pharmacology*. 2008 Jun 15;229(3):310-9.

Ciencewicki J*, **Gowdy KM***, Krantz QT, Linak WP, Brighton L, Gilmour MI, Jaspers I. Diesel exhaust enhanced susceptibility to influenza infection is associated with decreased surfactant protein expression. *Inhalation Toxicology*. 2007, 19(14):1121-33. * Both authors contributed equally.

Book Chapters:

Luebke, R.W., Beamer, C.A., Bowman, C. DeWitt, J.C., **Gowdy, K.**, Johnson, V.J. Shepherd, D.M., and Germolec, D.R. 2009. Immunotoxicology. In, *General and Applied Toxicology*, 3rd Edition, (Marrs, T., Ballantyne, B., and Syversen, T. eds), John Wiley and Sons, Ltd., Chichester, UK, pp1561-1583.

MI Gilmour and **KM Gowdy**. Host Defense and Immunotoxicology of the Lung. *Immunotoxicology and Immunopharmacology* 3rd Edition. 2007.

Invited Presentations

“Clean Up and Clear out; A Novel role for Scavenger Receptor B-I in Environmental Lung Diseases” *North Carolina State University, Environmental and Molecular Toxicology Program Seminar*, North Carolina State University, April 2015.

“Key Role for Scavenger Receptor B-I in the Integrative Physiology of Host Defense during Bacterial Pneumonia” *American Thoracic Society International Conference*, San Diego, CA, May 2014.

“Novel mechanisms of impaired pulmonary host defense by environmental factors” *Brody School of Medicine, Pharmacology and Physiology Department (joint seminar) invited talk*, East Carolina University, Greenville, NC 2014.

“Key Role for Scavenger Receptor B-I in the Integrative Physiology of Host Defense during Bacterial Pneumonia” *Biological Sciences Department invited talk*, Virginia Tech, Blacksburg, VA 2014.

“Key Role for Scavenger Receptor B-I in the Integrative Physiology of Host Defense during Bacterial Pneumonia” *Pulmonary Department invited talk*, Boston University, Boston, MA 2013.

“Scavenger Receptor B-I Regulates Pulmonary Host Defense and Neutrophil Function during Bacterial Pneumonia” *Laboratory of Respiratory Biology Work in Progress*, NIEHS, Research Triangle Park, NC 2013.

“Novel role for scavenger receptor B-I in pulmonary innate immunity” *Laboratory of Respiratory Biology Work in Progress*, NIEHS, Research Triangle Park, NC 2012.

“Viral immunity is impaired in the lungs of allogeneic bone marrow transplanted mice” *Duke University Medical Center Monthly SCCOR meeting*, Duke University Medical Center, Durham, NC 2011.

“Role of Surfactant Protein A (SP-A) in Alloimmune Lung Injury” *Duke University Medical Center Monthly SCCOR meeting*, Duke University Medical Center, Durham, NC 2009.

“Role of Surfactant Protein A (SP-A) in Alloimmune Lung and Gastrointestinal Injury” *Duke University Medical Center Monthly External Advisory SCCOR meeting*, Duke University Medical Center, Durham, NC 2009.

“Diesel Exhaust Exposure Increases Susceptibility to Influenza Infection and Induces Dendritic Cell Migration and Maturation” *American Thoracic Society International Conference*, Toronto, Canada, April 2008.

“Increased Severity of Influenza Infection in Mice Exposed to Diesel Exhaust” *American Thoracic Society International Conference*, San Francisco, CA, April 2007.

“Decreased Production of Surfactant Proteins after Diesel Exhaust Exposure Increases Susceptibility to Influenza Infection” *American Thoracic Society International Conference* San Diego, CA, April 2006.

“Increased Severity of Influenza Infection in Mice Exposed to Diesel Exhaust.” *National Health and Environmental Effects Research Laboratory Work in Progress*, U.S. Environmental Protection Agency, Research Triangle Park, NC. 2008.

“Increased Susceptibility to Influenza Infection in Mice Exposed to Diesel Exhaust.” *National Health and Environmental Effects Research Laboratory Work in Progress*, U.S. Environmental Protection Agency, Research Triangle Park, NC. 2006.

“Organic selenium affects broiler responses to immunostimulation.” *Poultry Science Association Annual Meeting*, Madison, WI, 2003.

Teaching Experience

Lecturer in General Physiology II (PHY 504) - “Respiratory Diseases” at North Carolina State University under the direction of Dr. John Godwin and Sabrina Robertson (Spring 2013).

Lecturer in NIEHS Summer Internship program – “Toxicity of Heavy Metals” (Spring 2013).

Lecturer in Fundamentals of Toxicology (TOX 701) - "Immunotoxicology" at North Carolina State University under the direction of Dr. Seth Kullman (Fall 2012 and 2013).

Lecturer in Principles of Toxicology (PHAR 7680) - "Immunotoxicology" at East Carolina University under the direction of Dr. Jamie DeWitt (Fall 2012).

Lecturer in NIEHS Scholars Connect Program Seminar -"The Graduate School Experience Panel" and "Preparing for Medical School/Graduate School during your sophomore and junior years" (Fall 2012).

Primary Coordinator for Advanced Topics in Immunology (IMM 816) at North Carolina State University- Lead and coordinated the schedule on Dendritic Cell Biology (Spring 2007).

Lecturer in Avian Anatomy and Physiology Laboratory Course (PO 405) at North Carolina State University under the direction of Dr. Frank Edens (Spring 2004).

Mentoring

Michael Yaeger, undergraduate researcher, East Carolina University, May 2015-present, currently a senior in Biomedical Engineering at East Carolina University.

Angel Allison, undergraduate researcher, East Carolina University, May 2015-August 2015, currently a sophomore in Biology at Johnson C. Smith University.

Julia L. Nugent, research technician, Duke University Medical Center, 2009-2011, currently in medical school at University of North Carolina.

Helen L. Zhang, undergraduate researcher, Duke University Medical Centers, 2008-2011, currently in medical school at Duke University.

Stephen Lahti, undergraduate researcher, Duke University Medical Centers, 2009-2010, currently in medical school at University of Pittsburgh.

Service and Outreach

Program Committee member for the Allergy Immunology and Inflammation Assembly (American Thoracic Society): Reviewed abstracts and proposals for annual meetings and organized workshops and symposia (May 2013- present).

Web and social media Committee member for the Allergy Immunology and Inflammation Assembly (American Thoracic Society): Responsible for social media, podcasts, and website for All assembly (May 2013- present).

Graduate Women in Science Fellowship Committee member: Review grant proposals for annual GWIS fellowship awards and solicit and organize reviewers grant review process (September 2013- present).

NIEHS Biomedical Career Fair Co Chair (United States Environmental Protection Agency), lead a team of 19 committee members to organize a career fair that offers workshops, panels, exhibitors, and one on one CV/resume review for approximately 300 attendees. Managed a budget of \$25000 (April 2013).

Committee member for the National Trainee Assembly Steering Committee for the NIEHS (September 2012-present).

Committee member for the National Trainee Leadership Organization for the United States Environmental Protection Agency (September 2004- August 2008).

Secretary for the Poultry Science Graduate Student Association (May 2002- May 2004).

Formal Peer Review

- ◆ 2008- Present Toxicological Sciences
- ◆ 2009- Present American Journal of Transplantation
- ◆ 2011- Present Particle and Fibre Toxicology
- ◆ 2012- Present PLoS One
- ◆ 2012- Present Journal of Visualized Experiments
- ◆ 2012- Present Toxicology
- ◆ 2012- Present Respiratory Research
- ◆ 2014- Present Journal of Immunology
- ◆ 2014- Present Mucosal Immunology

Research Support

Active:

start up funds, East Carolina University

Funds for starting up Gowdy Lab

Role: PI.

Agency: East Carolina University, Brody School of Medicine

Period: 11/1/2014-6/30/2018

Chronic administration of rhesusEpsiGam in a non human primate model of asthma.

Principal Investigator: Michael van Scott, PhD

Role: Co-Investigator

Tunitas Therapeutics

Period: 3/1/2015-2/28/2016 \$ 542,775.00 40% effort

Scavenger receptor BI regulates oxidized lipid driven pulmonary and vascular inflammation after ozone exposure (Walter A. Rosenblith New Investigator Award)

Principal Investigator: Kymberly Gowdy, PhD

Agency: Health Effects Institute

Period: 10/1/2015-9/30/2018 \$ 450,000.00 25% effort

The critical role of SR-BI in protecting against vascular inflammation and dysfunction following ozone exposure.

Principal Investigator: Kymberly Gowdy, PhD

Agency: East Carolina University Internal Seed Grant

Period: 9/1/2015-8/31/2016 \$ 15,000.00 0% effort

Rural Environmental Exposures among Children with Asthma.

Principal Investigator: Greg Kearney, PhD

Role: Co-Investigator

Agency: Brody Brothers Endowment Fund

Period: 11/01/15 – 10/31/16 \$ 60,000.00 0% effort

Pending:

Cell Sorter for East Carolina University Flow Cytometry Core.

Principal Investigator: Kymberly Gowdy, PhD

Agency: NIH (S10 Instrument grant mechanism)
Period: 2/01/16

Differential oral immune and inflammatory responses of oral epithelial cells caused by e-cigarette aerosols.

Multiple Principal Investigators: Kymberly Gowdy, Ph.D.; Seung-Hyun Cho, PhD
Agency: NIDCR/NIH
Period: 02/01/2016 - 01/31/2018

Dampening inflammation with SAME through phospholipid methylation.

Multiple Principal Investigators: Kymberly Gowdy, Ph.D.; S. Raza Shaikh, PhD
Agency: NICCH/NIH
Period: 09/01/2016 - 08/31/2018

Professional References:

Dr. Michael B. Fessler: Postdoctoral mentor
Phone: 919-541-3701
Email: fesslerm@niehs.nih.gov

Dr. M. Ian Gilmour: PhD mentor
Phone: 919-541-0015
Email: gilmour.ian@epa.gov

Dr. Ilona Jaspers: collaborator and PhD Committee member
Phone: 919-966-8657
Email: ilona_jaspers@med.unc.edu