



Welcome to the Ninth "One Medicine" Symposium



BUGS vs DRUGS: A ONE MEDICINE APPROACH TO ANTIMICROBIAL RESISTANCE

Welcome to the Ninth "One Medicine" Symposium, BUGS vs DRUGS: A One Medicine Approach to Antimicrobial Resistance. With the exception of 2011, the NC Department of Health and Human Services (NC DHHS) and the NC Department of Agriculture and Consumer Services (NCDA&CS) have hosted the annual One Medicine Symposium for eight years. The symposia goals are to educate and provide attendees with take-home tools that will heighten readiness for a natural or man-made disaster or infectious disease outbreak. We are back this year with all the same passion and looking forward to many more years of forward-looking topics.

Although the concept has been embraced since the mid-19th century, Dr. Calvin Schwabe revived the phrase "One Medicine" in the 1980s. This short and simple phrase, originally coined by Sir William Osler, summarizes the need for collaboration among multiple disciplines to more collectively approach health issues that threaten animals, humans and the environment.

The theme of the 2012 symposium, BUGS vs DRUGS: A One Medicine Approach to Antimicrobial Resistance, focuses on the effects of the development of antimicrobial resistances on human and animal health. This year's agenda encourages human and animal health professionals to come together to explore key questions regarding the prudent use of antimicrobials and their effects on the microbes and our environment so we can improve awareness and understanding of issues benefiting from the One Medicine approach. Previous symposium attendees have included physicians, veterinarians, nurses, veterinary technicians, public health professionals, Department of Defense participants, emergency managers, food industry representatives, and wildlife and agriculture professionals.

The NC Department of Agriculture and Consumer Services and the NC Department of Health and Human Services are pleased to host this conference. Our joint collaboration has made it possible for us to offer a world-class program with highly accredited speakers. We welcome you to learn and enjoy.

Sharron Stewart

Director, Emergency Programs Division
NC Department of Agriculture and Consumer Services

Julie Casani, MD, MPH

Branch Head & Bioterrorism Coordinator,
Public Health Preparedness & Response,
Division of Public Health
NC Department of Health and Human Services

SINCERE THANKS AND APPRECIATION TO...

Planning Committee Members:

Akers, Bruce, DVM, Regional Veterinary Specialist, NC Department of Agriculture & Consumer Services

Beck, Karen, DVM, PhD, Surveillance Veterinarian, NC Department of Agriculture & Consumer Services

Casani, Julie, MD, MPH, Preparedness Director, NC Division of Public Health

Daniels, Christin, MA, Director of Research, Gillings School of Global Public Health, University of North Carolina-Chapel Hill

Fleischauer, Aaron, PhD, MSPH, Career Epidemiology Field Officer, Centers for Disease Control & Prevention

Griese, Stephanie, MD, MPH, Epidemic Intelligence Service Officer, Centers for Disease Control & Prevention

Hall, Sharon, RN, PhD, Nurse Planner, CE Consultant, Health Education Specialist, Centers for Disease Control & Prevention

Haskell, Marilyn Goss, DVM, MPH, Public Health Veterinarian, NC Department of Health & Human Services, Division of Public Health

Jeffer, Kelly, DVM, Public Health Liaison Veterinarian, NC Department of Agriculture & Consumer Services

Kennedy-Stoskopf, Suzanne, DVM, PhD, Professor/Ecosystem Health Specialist, NC State University, School of Veterinary Medicine

Maillard, Jean Marie, MD, MSc, Medical Director, Communicable Disease Branch-Epidemiology Section, NC Division of Public Health

Mason, Sarah J., DVM, PhD, Director Animal Health Programs-Poultry, NC Department of Agriculture & Consumer Services

McElroy-Bacon, Connie, MEd, Continuing Education Coordinator, NC State University, Office of Professional Development

Moore, Zack, MD, MPH, Medical Epidemiologist, NC Division of Public Health

Nguyen, Trang, MPH, CHES, Health Education Specialist/Continuing Education Consultant, Centers for Disease Control & Prevention

Ray, Tom, DVM, MPH, Director, Animal Health Programs-Livestock, NC Department of Agriculture & Consumer Services

Stewart, Sharron, BS, Director Emergency Programs, NC Department of Agriculture & Consumer Services

Sticklin, Carrie, BS, Administrative Officer, NC Department of Agriculture & Consumer Services

Sullivan, Susan, RN-BC, MS, Public Health Nurse Consultant, Training/Exercise Facilitator, NC PHP&R Central Region Office

Williams, Carl, DVM, State Public Health Veterinarian, NC Department of Health & Human Services

Moderators:

Davies, Megan, MD, State Epidemiologist & Epidemiology Section Chief, NC Division of Public Health

Devlin, Leah, DDS, MPH, Professor of Practice, Gillings School of Global Public Health, University of North Carolina-Chapel Hill

Moore, Zack, MD, MPH, Medical Epidemiologist, NC Division of Public Health

Slenning, Barrett, MS, DVM, MPVM, Assoc Professor; Director of Agrosecurity & Biopreparedness, NC State University, College of Veterinary Medicine

Special Thanks to:

North Carolina State University (NCSU) College of Veterinary Medicine (CVM)

UNC Gillings School of Global Public Health (GSGPH)

NCSU Office of Professional Development (OPD)

BUGS VS DRUGS: A ONE MEDICINE APPROACH TO ANTIMICROBIAL RESISTANCE

TABLE OF CONTENTS

Sheraton Imperial Map.....	page 4
General Information.....	page 5
Detailed Agenda.....	pages 6-7
Continuing Education Information.....	pages 8-10
Speaker Biographies.....	pages 11-17
Abbreviated Glossary & Dictionary.....	page 18
Additional Resources.....	pages 19-23
Additional Notes.....	pages 24-26

MAP

Sheraton Imperial Hotel & Convention Center Research Triangle Park, NC Meeting & Event Facilities



Wednesday-Thursday, December 5th-6th

Registration: Imperial Foyer I

General Session: Imperial I, II, III, IV

Lunch: Imperial V, VI, VII

GENERAL INFORMATION

Event Location:

All 2012 symposium meetings and events will take place at the Sheraton Imperial Hotel and Convention Center at 4700 Emperor Blvd., Durham, NC 27703. The symposium will be held in the Imperial Ballroom. A map of the hotel with meeting locations can be found on page 4 of this guide and on signs in the hotel.

Hotel Contact Information:

(919) 941-5050
1-800-325-3535
(919) 941-2958 fax
www.sheratonrtp.com

Conference Times:

Wednesday, December 5

Registration: 7:00 - 8:30 am
Welcome: 8:30 - 9:00 am
Sessions: 9:00 am - 5:05 pm
Lunch: 12:30 - 1:30 pm
Breaks: 10:30 - 10:45 am
3:10 - 3:25 pm

Thursday, December 6

Welcome: 8:30 - 8:45 am
Sessions: 8:45 am - 4:40 pm
Lunch: 12:00 - 1:15 pm
Breaks: 10:05 - 10:20 am
3:15 - 3:30 pm

Continuing Education & Evaluation Forms:

If you wish to receive CMEs, CNEs, CEUs or a certificate of participation for non-physicians, please go to www.cdc.gov/TCEOnline. At this site, you will evaluate this educational activity (SP2151EV), complete the post test and receive a certificate/statement to print-out.

Participants wishing to obtain Veterinary continuing education credit or Environmental Health Specialist continuing education credits should visit the registration desk at the conclusion of the symposium and return a completed evaluation to receive the appropriate credits.

Complete continuing education information is available on pages 8-10 of this guide.

Questions or Concerns?

Please visit the symposium registration desk with any meeting or hotel issues. We will do our best to address your needs!

Speaker Presentations:

With the approval of our speakers, speaker presentations will be available for download after the symposium at: www.OneMedicineNC.org.

Conference Notices:

Notice of changes in program, special events, speakers, etc., will appear on sign boards in the registration area.

Hotel Shuttle Service:

The Sheraton Imperial offers a courtesy shuttle service to all guests. The shuttle prioritizes all guests with a scheduled airport arrival/departure, but is otherwise available to transport guests to any restaurant within a 3-mile radius from the hotel. It is not guaranteed that the shuttle will be available upon request.

Area Attractions:

If you are interested in local happenings, restaurants, directions, etc. in the surrounding cities, please visit the following websites:

Raleigh: www.visitraleigh.com

Durham: www.durham-nc.com

Chapel Hill: www.chocvb.org

Participants with Special Needs:

Please contact the symposium registration desk with any reasonable accommodations you need in order to participate in this conference.

Wi-Fi:

Complimentary wireless internet service is available in the main hotel lobby and restaurant area.

WEDNESDAY, DECEMBER 5

Imperial Rooms I, II, III, IV

7:00 am	Registration	1:30 pm	Antimicrobial Resistance (AMR), Human Pathogens-What's hot and what's the risk? Kurt Stevenson, MD, MPH The Ohio State University, College of Medicine
8:30 am	Welcome and Opening Remarks Laura Gerald, MD State Health Director NC Department of Health and Human Services Steve Troxler Commissioner NC Department of Agriculture and Consumer Services	1:50 pm	AMR, Food Animal Pathogens-What's hot and what's the risk? Peter Davies, BVSc, PhD University of Minnesota
9:00 am	Human Use-History, where we are now, why & how did we get here? Kurt Stevenson, MD, MPH The Ohio State University, College of Medicine	2:10 pm	AMR, Companion Animal Pathogens-What's hot and what's the risk? Megan Jacob, MS, PhD North Carolina State University, College of Veterinary Medicine
9:45 am	Animal Use-History, where we are now, why & how did we get here? Mike Apley, DVM, PhD Kansas State University, College of Veterinary Medicine	2:30 pm	MRSA in Companion Animals Jeff Bender, DVM, MS University of Minnesota, Center for Animal Health and Food Safety
10:30 am	Networking Break	3:10 pm	Networking Break
10:45 am	Environmental-What's out there? Where's it all going? Damian Shea, PhD North Carolina State University, College of Agriculture & Life Science	3:25 pm	MRSA in Food Animals Peter Davies, BVSc, PhD University of Minnesota
11:30 am	One Medicine-Antimicrobial Resistance, the Big Picture Leah Dorman, DVM Ohio Farm Bureau Federation, Food Programs	4:05 pm	MRSA in Human Population Vance Fowler, Jr., MD, MHS Duke University, Department of Medicine, Division of Infectious Diseases
12:30 pm	Networking Lunch	4:45 pm	Round Table-Q&A with Presenters

THURSDAY, DECEMBER 6

Imperial Rooms I, II, III, IV

8:30 am **Welcome and Opening Remarks**

Barbara Rimer, DrPH, MPH
 Dean of UNC Gillings School of Global Public Health

Kathryn Meurs, BS, DVM, PhD
 Associate Dean for Research and Graduate Studies, NCSU College of Veterinary Medicine

8:45 am **Parasites & Drug Resistances (Human)**

Steven Meshnick, MD, PhD
 UNC Gillings School of Global Public Health

9:25 am **Parasites & Drug Resistances (Animal)**

Adam Birkenheuer, DVM, PhD, DACVIM
 North Carolina State University, College of Veterinary Medicine

10:05 am **Networking Break**

10:20 am **Global Environmental Changes-Are we making populations?**

Jill Stewart, MS, PhD
 University of North Carolina Chapel Hill, Department of Environmental Science & Engineering

11:00 am **State of Antibiotic Development-Staying one step ahead?**

Jeffrey L. Watts, PHD, RM (NRCM), M (ASCP)
 Director, Global Anti-Infectives Research, Pfizer Animal Health

12:00 pm **Networking Lunch**

1:15 pm **Charting a Course for our Professions (Human)**

Christopher Ohl, MD
 Wake Forest Baptist Medical Center

1:55 pm **Charting a Course for our Professions (Animals)**

Mike Apley, DVM, PhD
 Kansas State University, College of Veterinary Medicine

2:35 pm **Charting a Course for our Professions (Environment)**

Mark Sobsey, MS, PhD
 UNC Gillings School of Global Public Health

3:15 pm **Networking Break**

3:30 pm **Legislation-Current & What's on the Horizon**

Michael Murphy, DVM, JD, PhD
 FDA Center for Veterinary Medicine

4:20 pm **Round Table-Q&A with Presenters**

4:40 pm **Evaluations/AAR Comments & Certificates**

Veterinarians and Environmental Health Specialists
-Don't forget to complete your evaluation form and pick up your continuing education certificate!

-For CMEs, CNEs, and CEUs, please see pages 8-10 for directions to online evaluation and certificates.

Continuing Education Information

NINTH ONE MEDICINE SYMPOSIUM BUGS VS DRUGS: A ONE MEDICINE APPROACH TO ANTIMICROBIAL RESISTANCE

SP2151EV

ACCREDITATION STATEMENTS

CME activities with Joint sponsors

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the **Centers for Disease Control and Prevention (CDC), the North Carolina Department of Health, and Human Services, and the North Carolina Department of Agriculture and Consumer Services**. CDC is accredited by the ACCME® to provide continuing medical education for physicians.

The Centers for Disease Control and Prevention designates this live educational activity for a maximum of **12.75 AMA PRA Category 1 Credits™**. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Continuing Education designated for non-physicians:

Non-physicians will receive a certificate of participation.

Continuing Nursing Education for Nurses (CNE):

The Centers for Disease Control and Prevention is accredited as a provider of Continuing Nursing Education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity provides **12.7** contact hours.

IACET Continuing Education Units (CEU):

The CDC has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102. The CDC is authorized by IACET to offer **1.3** ANSI/IACET CEU's for this program.

DISCLOSURE STATEMENTS

In compliance with continuing education requirements, all presenters must disclose any financial or other associations with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters as well as any use of unlabeled product(s) or product(s) under investigational use.

CDC, our planners, and our presenters wish to disclose they have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters with the exception of the following:

-Dr. Michael Apley received an honorarium for being on the advisory board of JBS/Swift Company and that he received honorarium for private projects, and research support for KSU projects as a consultant.

-Dr. Leah Dorman receives a salary as a current employee of the Ohio Farm Bureau Federation.

-Dr. Vance Fowler:

- 1) received an honorarium from Merck when he served as the V710 Staph aureus Vaccine Scientific Advisory Board Co-Chair.
- 2) received honorarium as a consultant from Pfizer, Novartis, Galderma, Novadigm, Durata, Achaogen, Medicine Co., Cerexa, Medimmune
- 3) received grant support to Duke University for research from NIH, Medimmune, Cerexa, Pfizer, Merck, Advanced Liquid Logics, Theravance, Novartis
- 4) received honoraria for development of an educational presentation from Cubist, Cerexa, Theravance
- 5) is currently under consideration for research grant to genotype clinical isolates from registrational clinical trial from Medicines Company
- 6) received support for travel to meetings (ECCMID, IDSA) to present results of V710 S aureus vaccine clinical trial, of which he is the lead investigator and 1st author from Merck

-Dr. Damian Shea wishes to disclose that he received a monetary fee from BP Exploration & Production where he served as a consultant.

-Dr. Mark Sobsey receives stock equivalents as co-founder and co-owner of Aquagenx, LLC.

-Dr. Jeffrey Watts receives salary/stocks as a current employee of Pfizer Animal Health.

Planning committee discussed conflicts of interest with Drs. Apley, Dorman, Fowler, Shea, Sobsey and Watts to ensure there is no bias.

Presentations will not include any discussion of the unlabeled use of a product or a product under investigational use with the exception of Dr. Birkenheuer's discussion on "Parasites and Drug Resistances in Animals". He will be discussing this due to the fact that there are no approved drugs to treat cytauxzoonosis and the only drug for treatment of canine babesiosis in the USA does not clear B. gibsoni infection.

CDC does not accept commercial support.

METHOD OF PARTICIPATION:

You may participate in the educational activity by attending the One Medicine Symposium, December 5-6, 2012, Sheraton Imperial Hotel & Convention Center, Durham, NC.

CDC EVALUATION & Credit:

To evaluate this educational activity, receive a certificate/statement of credit, to print-out an on-going transcript of all your TCEOnline CE activities for credits/contact hours, please go to:
www.cdc.gov/TCEOnline.

FEES: No fees are charged for CDC's CE activities.

VETERINARY CONTINUING EDUCATION CREDIT:

The North Carolina Veterinary Medical Board has approved this program for 12.75 hours of continuing education credit for veterinarians and veterinary technicians.

ENVIRONMENTAL HEALTH SPECIALISTS CONTINUING EDUCATION CREDIT:

The North Carolina Board of Environmental Health Specialist Examiners has approved this program for 8.75 hours of continuing education credit. Course #12295

Participants wishing to obtain **Veterinary continuing education** credit or **Environmental Health Specialist** continuing education credit should visit the registration desk at the conclusion of the symposium and return a completed evaluation to receive the appropriate credits.

SPEAKER BIOGRAPHIES

Dr. Michael D. Apley

Professor of Clinical Sciences, Kansas State University, College of Veterinary Medicine
BS Life Sciences, 1981, Kansas State University
DVM Veterinary Medicine, 1987, Kansas State University
PhD Physiology/Clinical Pharmacology, 1992, Kansas State University

Dr. Apley's research has an emphasis in food animal clinical Pharmacology, especially the use of antimicrobials in food animal production. He works with veterinarians in production systems for multiple species, and have done research ranging from basic pharmacokinetics to clinical trials. He teaches antimicrobial clinical pharmacology in a veterinary medicine curriculum.

Dr. Jeff Bender

Professor University of Minnesota, College of Veterinary Medicine and The School of Public Health
BS Biology, 1985, California Polytechnic University-San Luis Obispo
DVM Veterinary Medicine, 1989, University of Minnesota
MS Epidemiology & Veterinary Medicine, 1995, University of Minnesota

Dr. Bender is a Professor at the University of Minnesota, College of Veterinary Medicine and also has an appointment in the School of Public Health. He previously worked for the Minnesota Department of Health (MDH), as an infectious disease epidemiologist. He served as the Chair for the National Association of State Public Health Veterinarians "Compendium on measures to prevent diseases associated with animals in public settings". He was the Principle Investigator on a CDC funded Cooperative Agreement on Zoonotic Influenza Infections and the Director of the Center for Animal Health and Food Safety at the University of Minnesota. Currently, he is the Associate Director for the NIH funded Minnesota Center of Excellence for Influenza Research and Surveillance (MCEIRS) and Co-Director of the NIOSH funded Upper Midwest Agricultural Health and Safety Center (UMASH). He also serves on the US Food and Drug Administration, Science Advisory Board. Dr. Bender's primary teaching and research interests include emerging zoonotic diseases, disease surveillance, food safety and antimicrobial resistance.

Dr. Adam Birkenheuer

Associate Professor NC State University, College of Veterinary Medicine
BS Biology, 1991, University of Central Florida
DVM Veterinary Medicine, 1995, University of Florida
PhD Immunology, 2004, NC State University

Adam Birkenheuer is an associate professor of small animal internal medicine at North Carolina State University College of Veterinary Medicine. In addition to his clinical duties in the small animal hospital, Dr. Birkenheuer is a co-director of the vector borne disease diagnostic laboratory. His research program is focused on the diagnosis, treatment and prevention of companion animal infectious diseases. We have recently sequenced the genome of two protozoan parasites and are investigating resistance to anti-protozoal drugs.
<http://www.ncbi.nlm.nih.gov/pubmed?term=Birkenheuer%20a>

Dr. Peter Davies

Professor of Swine Health & Production, University of Minnesota
BVSc Veterinary Science, 1975, Melbourne University, Australia
PhD Veterinary Science, 1983, University of Sidney, Australia

Dr. Davies’ professional experience includes seven years in clinical veterinary practice in Australia, New Zealand, the United Kingdom and Brazil, as well as 4 years of government veterinary experience in Australia. He has been involved in swine health research since 1987, with a focus on foodborne diseases and zoonoses. Previous positions and activities include:

Research interests (author/co-author of more than 70 peer reviewed publications)

- Epidemiology of infectious diseases of swine, including zoonoses
- Foodborne pathogens in food animal production
- Disease surveillance systems.
- Societal issues related to food animal production

2003-2009:

Allen D. Leman Chair of Swine Health and Productivity, University of Minnesota

1994 - 2003:

MAF Professor of Public Health and Food Safety, Massey University, New Zealand
Associate Professor of Swine Health and Production, North Carolina State University, USA

2000-2007

Member, International Scientific Committee of the International Research Center in Veterinary Epidemiology, Copenhagen, Denmark.

Invited speaker or presenter at numerous national and international scientific meetings on swine health and production, veterinary epidemiology and food safety.

Dr. Leah Dorman

Director of Food Programs for the Center for Food and Animal Issues at the Ohio Farm Bureau Federation
BS Animal Science, The Ohio State University
DVM Veterinary Medicine, The Ohio State University

As director of food programs, Dr. Dorman develops and executes programs throughout the state that help advocate for accepted agriculture, food processing, and animal practices.

Dr. Dorman most recently served as the assistant state veterinarian at the Ohio Department of Agriculture, where she started as a veterinary medical officer in 2001. Other past experiences, including private practice, have had her working directly with food animal veterinarians and producers, as well as 4-H and FFA. Currently, she is a member of the Board of Directors of the National Institute for Animal Agriculture, as well as co-chairperson of their Antibiotic Council. She is co-chairperson of the Ohio Emergency Management Agency’s Animal Health Emergency Technical Advisory Committee. She has also served as a member of the Wood County (Ohio) Board of Health. Dr. Dorman is a member of the Ohio Veterinary Medical Association, the American Veterinary Medical Association, the U.S. Animal Health Association, and the National Institute for Animal Agriculture.

A native of Findlay, Ohio, Dr. Dorman did her undergraduate study in animal science and earned her doctorate of veterinary medicine from The Ohio State University. She lives on a farm in Croton, Ohio with her husband, Brad, and three daughters, Olivia, Cora and Darla. She enjoys reading, watching her girls play softball and music.

Dr. Vance G. Fowler

Professor Duke University Medical Center

BA English & Zoology, 1988, Duke University

MD Medicine, 1993, University of North Carolina Chapel Hill

Intern/Resident Medicine, 1993-1996, Duke University Medical Center

Fellow Infectious Diseases, 1996-1999, Duke University Medical Center

MHS Clinical Research, 1999, Duke University Medical Center

DTM&H Tropical Medicine, 2000, American Society of Tropical Med & Hygiene

1993-1996	Intern & Resident in Internal Medicine Duke U, Medical Center, Durham, NC
1996-1999	Infectious Diseases Fellow, Duke University Medical Center, Durham, North Carolina
1997-1999	Health Services Research Fellow, VA Hospital, Durham, North Carolina
1999-2000	Associate, Division of Infectious Diseases, Duke University Medical Center, Durham, NC
2000-2005	Assistant Professor, Duke Univ Medical Center, Durham, NC
2005-2008	Associate Professor without Tenure, Duke University Medical Center
2008-2011	Associate Professor with Tenure, Duke University Medical Center
2012	Professor with Tenure, Duke University Medical Center

Selected Honors and Awards

1990	Rotary International Fellowship, Tanzania; UNC School of Medicine
1993	MAP-Reader's Digest International Fellowship, Zambia; UNC School of Medicine
1993	Alpha Omega Alpha (AOA), UNC School of Medicine
2001	American Federation for Medical Research Junior Physician-Investigator Award
2001	American Society for Microbiology Young Investigator Award
2006	Ruth & A. Morris Williams, Jr. Faculty Research Award Duke Univ. Med Center
2007	American Society for Clinical Investigation (ASCI)
2007	Infectious Diseases Society of America (IDSA)/SHEA Special Recognition Award in MRSA
2008	Infectious Diseases Society of America Oswald Avery Award
2011	American Federation for Medical Research Outstanding Investigator Award
2012	Clinical Research Outstanding Achievement Award; Clinical Research Forum

Author or co-author of more than 150 Peer Reviewed Publications for Journals.

Dr. Megan Jacob

Assistant Professor Clinical Microbiology, NC State University, College of Veterinary Medicine

BS Microbiology, 2005, University of Wyoming

MS Pathobiology, 2007, Kansas State University

PhD Pathobiology, 2010, Kansas State University

Dr. Megan Jacob was appointed an Assistant Professor and Director of the Clinical Microbiology Laboratory at the North Carolina State University College of Veterinary Medicine in March of 2011. She came to Raleigh after completing her undergraduate education in microbiology at the University of Wyoming and her MS, PhD and post-doctoral work in veterinary pathobiology at Kansas State University. Her graduate and post-doctoral research programs were focused on the epidemiology and ecology of foodborne pathogens, particularly E. coli O157, in feedlot cattle prior to harvest. In addition to Megan's continued research experience in pre-harvest food safety, she has a strong interest in veterinary diagnostic microbiology. Prior to her position at NCSU, she spent six months training in veterinary hospitals and diagnostic laboratories in Kansas, Wisconsin, Nebraska and Texas. Megan aims to be at the forefront in advancements in diagnosing and monitoring antimicrobial resistant infections in animal populations, and continuously works to improve the laboratory diagnostic experience for veterinary clinicians.

Dr. Steven Meshnick

BA, Columbia University

MD, Cornell University

PhD, Rockefeller University

Dr. Meshnick was born in New York City and where he also received his BA (from Columbia), MD (from Cornell) and PhD (from Rockefeller University). He spent one year in Nairobi, Kenya at the International Laboratory for Research in Animal Diseases. He moved from New York City to join the faculty at the University of Michigan School of Public Health in 1992, and moved to UNC’s Gillings School of Global Public Health in 2001. Dr. Meshnick has over 250 scientific publications. He has worked extensively in Africa and Thailand on studies of malaria during pregnancy. He and his research colleagues use molecular markers to study the epidemiology of drug resistant malaria and to measure genetic population structure. He has also worked on HIV, Pneumocystis jiroveci, leishmaniasis and Human African Trypanosomiasis and is currently studying tick-borne rickettsial diseases.

Dr. Mike Murphy

VMO Office of Surveillance & Compliance of the Center for Veterinary Medicine, FDA

DVM Veterinary Medicine, 1981, Texas A&M University

PhD Toxicology, 1987, Texas A&M University

JD, 1999, William Mitchell College of Law

Dr. Murphy is serving as a VMO in the Division of Surveillance, Office of Surveillance & Compliance of the Center for Veterinary Medicine of the FDA.

Dr. Christopher A. Ohl

Professor of Medicine and Medical Director, Center for Antimicrobial Utilization, Stewardship and Epidemiology

BS (Magna Cum Laude) 1982, University of Wisconsin--Eau Claire

MD Medicine, 1986, University of Wisconsin School of Medicine

POSTDOCTORAL TRAINING:

1986 - 1987 Internship, Categorical Internal Medicine, National Naval Medical Center, Bethesda, Maryland

1990 - 1992 Residency, Internal Medicine, National Naval Medical Center, Bethesda, Maryland

1992 - 1994 Fellowship, Infectious Diseases, National Naval Medical Center, Bethesda, Maryland

1994 Walter Reed Army Institute of Research Course in Tropical Medicine, Washington D.C.

Research activities and interests:

Regional surveillance for antimicrobial resistance in community and hospital pathogens

Clinical antimicrobial resistance and its relationship to antibiotic use

Epidemiology of antimicrobial resistance in the community and hospital

Bioterrorism

Emerging Infections

Author of numerous book chapters and author or co-author of a vast number of peer reviewed journal articles on infectious diseases.

Dr. Damian Shea

Professor NC State University

BS Chemistry, 1981, State University of New York

PhD Environmental Chemistry, 1985, University of Maryland

Dr. Damian Shea is Professor of Biology and Environmental Toxicology at North Carolina State University. He received his PhD in Environmental Chemistry from the University of Maryland in 1985 and was awarded NRC and AAAS Post-Doctoral Fellowships. After working as an environmental consultant, he joined the faculty at NCSU in 1993. Over the past 10 years, he has served as Head of both the Departments of Biology and Toxicology. He has a broad background in environmental/analytical chemistry and toxicology with primary research interests in the detection, sources, behavior, and effects of chemicals in the aquatic environment. His ultimate goal is to improve our ability to assess chemical exposure and thereby improve human and ecological risk assessments. His research has included direct measurement of antibiotics in the environment, modeling the fate of antibiotics in the environment, and most recently using passive sampling devices to measure hundreds of chemicals and their metabolites in water to better understand the mechanisms controlling bioavailability of chemicals in water/sediment/soil systems, including antibiotics.

Dr. Mark D. Sobsey

Kenan Distinguished Professor of Environmental Sciences & Engineering, University of North Carolina
Chapel Hill

BS Biology, 1965, University of Pittsburgh

MS Hygiene, 1967, University of Pittsburgh Graduate School of Public Health

PhD Environmental Health Science, University of California-Berkeley

Professor Sobsey is internationally known for research, service and teaching in environmental health microbiology and virology and in water, sanitation and hygiene, with more than 200 published papers and reports. His research, teaching and service encompass the detection, characterization, occurrence, environmental survival/transport/fate, treatment, human health effects characterization and risk assessment of viruses, bacteria and parasites of public health concern in water, wastewater, biosolids, soil, air and food for the prevention and control of water, food and excreta-borne disease. Prof. Sobsey has done extensive research on the occurrence, characterization, and environmental and health impacts of antimicrobial resistant bacteria from human and animal agriculture sources, especially from commercial swine farms. His most recent research focuses on household water treatment for improved water quality and health and on appropriate microbial detection technologies for water, for which he is recognized as a pioneer in research, demonstration and policy. Professor Sobsey is an author, consultant and scientific advisor to the World Health Organization, The World Bank, US Agency for International Development, US Environmental Protection Agency, The Centers for Disease Control and Prevention, the State of North Carolina and other international, national and state entities. His honors include 2001 recipient of the American Water Works Association A.P. Black Award for research excellence, 2008 recipient of the International Water Association Project Innovations Award-Small Project category, Asia Region and Global competitions (for work on porous ceramic water filters in Cambodia), a 2009 Pioneer Award from the Disinfection Committee of the Water Environment Federation and a 2010 Water Innovation Award from the Launch.org program.

Dr. Kurt B. Stevenson

Professor of Medicine and Epidemiology, The Ohio State University

BS Microbiology & Chemistry, 1977, Brigham Young University

MS Microbiology & Biochemistry, 1979, Brigham Young University

MD Medicine, 1983, University of Utah

MPH Health Services, 2001, University of Washington

Kurt B. Stevenson, MD, MPH, is Professor of Medicine and Epidemiology with tenure at the Ohio State University Colleges of Medicine and Public Health, and Associate Medical Director of the Department of Clinical Epidemiology at the Ohio State University Wexner Medical Center (OSUWMC) in Columbus, Ohio. He serves as the Medical director of the OSUWMC Antimicrobial Stewardship Program.

A graduate of the University of Utah School of Medicine, Dr. Stevenson completed a residency in internal medicine and a fellowship in infectious diseases at the University of Iowa. He is certified by the American Board of Internal Medicine in both specialties. He has also completed a Masters of Public Health degree from the University of Washington School of Public Health and Community Medicine. He was a member of the CDC Healthcare Infection Control Practices Advisory Committee (HICPAC) from 2004-2009 and was a Principal Investigator of a CDC-funded Prevention Epicenter grant at Ohio State University from 2006 to 2011. He has been appointed to the FDA Anti-Infective Drug Advisory Committee since May 2012.

Along with a clinical infectious diseases practice responsibilities at OSUWMC, Dr. Stevenson has been involved with antimicrobial management, antimicrobial resistance, and infection control activities and studies for more than 25 years and is a frequent local and national speaker on these topics. His research expertise is in the area of the development, acquisition, and transmission of antimicrobial pathogens.

Dr. Jill R. Stewart

Assistant Professor Department of Environmental Sciences & Engineering, University of North Carolina Chapel Hill
BA Environmental Sciences, 1996, University of Virginia
MS Environmental Sciences & Engineering, 1998, University of North Carolina
PhD Environmental Sciences & Engineering, 2003, University of North Carolina

Jill Stewart is an Assistant Professor in the Department of Environmental Sciences and Engineering at the University of North Carolina. Prior to this position, Dr. Stewart served as Principal Investigator at a NOAA Center of Excellence for Oceans and Human Health in Charleston, SC. Dr. Stewart is developing novel techniques to detect and track pathogens in water. She is also interested in evaluating impacts of non-point source pollution, and in evaluating the manner in which human activities such as development and waste disposal affect distribution of microbial contaminants. Research projects include (1) epidemiology studies of bathing beaches impacted by non-point source pollution and (2) development of a stress-response model for forecasting the impacts of land use change within watersheds. An expert in microbial source tracking, Dr. Stewart contributed to a guide document on this topic for the US Environmental Protection Agency. She has also been instrumental in planning workshops and conference symposia on topics pertinent to environmental health microbiology. Overall, these activities are leading to a greater understanding of how environmental conditions can affect human health, and how humans themselves influence this process.

Dr. Jeffrey L. Watts

Director of Anti-Infectives Research, Pfizer Animal Health
BS Microbiology, 1978, Louisiana Tech University
MS Microbiology, 1983, Louisiana Tech University
PhD Biological Sciences, 2000, Western Michigan University

Over twenty-three years experience in Antibacterial Discovery in the pharmaceutical industry. Currently, Director and Unit Head for Anti-Infectives Research within the Global Therapeutics Research Unit of Pfizer Animal Health (PAH). Responsibilities include the discovery and support for the anti-infectives portfolio for PAH. Trained as both a Clinical and Veterinary Microbiologist (ASCP and NRCM certifications in clinical microbiology).

Author or co-author of 3 book chapters, 14 standards/guidelines, 87 refereed journal articles, 72 abstracts, and numerous external scientific presentations related to clinical or veterinary microbiology. Inventor or co-inventor on 9 patents.

Involved in discovery and support of currently marketed anti-infectives such as ceftiofur, spectinomycin, lincomycin, pirlimycin, penicillin-novobiocin, clindamycin, and tulathromycin in animal health and clindamycin, cefpodoxime, and linezolid in human health.

Chair of the CLSI Subcommittee on Veterinary Antimicrobial Susceptibility Testing from 1993-2000 and from 2007-2012. Sponsor and member of the Subcommittee on Antimicrobial Susceptibility Testing of Human Mycoplasmas.

American Society for Microbiology Waksman Foundation Lecturer (2000-2002)

ABBREVIATED GLOSSARY & DICTIONARY

AHEC: Area Health Education Center	NBIS: National Biosurveillance Integration System
AMR: Antimicrobial Resistance/Resistant	NCDA&CS: North Carolina Department of Agriculture and Consumer Services
APHIS: USDA Animal and Plant Health Inspection Service	NC DENR: North Carolina Department of Environment and Natural Resources
AVMA: American Veterinary Medical Association	NC DHHS: North Carolina Department of Health and Human Services
BSL: Bio-safety level (rating for laboratories handling certain levels of disease organisms)	NC DPH: North Carolina Division of Public Health
BT: Bioterrorism	NCEM: North Carolina Division of Emergency Management
CDB: Communicable Disease Branch (NC DHHS)	NC PHP&R: North Carolina Office of Public Health Preparedness and Response
CDC: Centers for Disease Control and Prevention	NCSU CVM: North Carolina State University College of Veterinary Medicine
CVB: Center for Veterinary Biologics	NCSU OPD: North Carolina State University Office of Professional Development
DACVPM: Diplomate for the American College of Veterinary Preventative Medicine	NIMS: National Incident Management System
DHS: Department of Homeland Security	NRP: National Response Plan
DVM: Doctor of Veterinary Medicine degree	OEMS: Office of Emergency Medical Services
EOC: Emergency Operations Center	PHRST: Public Health Regional Surveillance Team
FBI: Federal Bureau of Investigation	PIO: Public Information Officer
FDA: US Food and Drug Administration	R&D: Research and Development
FERN: Food Emergency Response Network	SBI: State Bureau of Investigation
FSA: Farm Services Administration	SCWDS: Southeastern Cooperative Wildlife Disease Study
FSIS: USDA Food Safety Inspection Service	SLPH: State Laboratory of Public Health
HSPD: Homeland Security Presidential Directive	SOP: Standard Operating Procedures
IAIP: Information Analysis and Infrastructure Protection	UNC GSGPH: University of North Carolina Gillings School of Global Public Health
IAP: Incident Action Plan	USDA: United States Department of Agriculture
ICS: Incident Command System	
ISAAC: Information Sharing & Analysis Center	
Line Listing: A tool produced by epidemiologists for organizing information about time, person and place in outbreak investigations	
MPH: Master of Public Health degree	
MHTD: Multi-Hazard Threat Database	
MRSA: Methicillin Resistant Staph aureus	
NBIC: National Biosurveillance Integration Center	

ADDITIONAL RESOURCES

American Veterinary Medical Association (AVMA)

www.avma.org

The AVMA represents over 73,000 veterinarians in numerous practice settings. The organization's website includes scientific, member and public resources about a variety of animal and public health issues.

Centers for Disease Control and Prevention (CDC)

<http://www.cdc.gov/drugresistance/about.html>

The CDC is one of the major components of the US Department of Health and Human Services. The CDC's mission is to collaborate to create the expertise, information and tools that people and communities need to protect their health—through health promotion, prevention of disease, injury and disability, and preparedness for new health threats.

CDC, Emergency Preparedness & Response

www.bt.cdc.gov

This site is intended to increase the nation's ability to prepare for and respond to public health emergencies. The Emergency Preparedness & Response website provides a wide variety of resources about bioterrorism agents, chemical emergencies, radiation emergencies, mass casualties, natural disasters, severe weather, recent outbreaks and incidents.

CDC, Antibiotic & Antimicrobial Resistance

<http://www.cdc.gov/drugresistance/actionplan/taskforce.html>

The **Interagency Task Force on Antimicrobial Resistance** was initiated in 1999 following a congressional hearing on the topic "Antimicrobial Resistance: Solutions to a Growing Public Health Problem." The Task Force brings together multiple federal agencies to address the complex issue of antimicrobial resistance.

Companion Animal Parasite Council (CAPC)

www.capcvet.org

Companion Animal Parasite Council fosters animal and human health, while preserving the human – animal bond, through recommendations for the diagnosis, treatment, prevention and control of parasitic infections. This website has material on vector-borne diseases.

Infectious Diseases Society of America (IDSA)

<http://www.idsociety.org/Index.aspx>

IDSA represents physicians, scientists and other health care professionals who specialize in infectious diseases. IDSA's purpose is to improve the health of individuals, communities and society by promoting excellence in patient care, education, research, public health and prevention relating to infectious diseases.

NC Communicable Disease Control Manual

www.epi.state.nc.us/epi/gcdc/manual/toc.html

From NC DHHS Division of Public Health, the Communicable Disease Control Manual contains useful references including a contact list, a General Guide to Foodborne Diseases, and a chapter on each of North Carolina’s reportable diseases.

NC Department of Agriculture and Consumer Services (NCDA&CS)

Emergency Programs Division

www.ncagr.com/oep

The Emergency Programs Division’s mission is to reduce the vulnerability to, or the impact from, any disaster, disease or terrorist attack on the agriculture community of North Carolina. Their website contains resources for the public, veterinary and agricultural communities.

NC Department of Health and Human Services (NC DHHS)

www.ncdhhs.gov

The mission of NC DHHS, in collaboration with its partners, protects the health and safety of all North Carolinians and provides essential human services.

NC DHHS, Division of Public Health, Environmental Health Section

<http://www.deh.enr.state.nc.us/>

The mission of the Environmental Health Section of the Division of Public Health is to safeguard life, promote human health and protect the environment through the practice of modern environmental health science, the use of technology, rules, public education and above all, dedication to the public trust.

NC Division of Emergency Management (NCEM)

<https://www.ncdps.gov/Index2.cfm?a=000003,000010>

The NCEM website provides information on training opportunities, family preparedness and links to other resources.

NC Division of Public Health, State Laboratory of Public Health (SLPH)

<http://slph.state.nc.us/Microbiology/default.asp>

The mission of the Microbiology unit is to provide clinical and reference bacteriological services to public and private laboratories in North Carolina. A wide variety of specimen types are examined. Many of the services performed here are available only at the NCSLPH and the Centers for Disease Control and Prevention (CDC) in Atlanta, GA.

NC Office of Public Health Preparedness and Response (PHP&R)

www.epi.state.nc.us/epi/phpr

Part of the NC DHHS Division of Public Health, the PHP&R website offers a variety of information about bioterrorism and disease surveillance. The site includes contact information for the Public Health Regional Surveillance Teams and a link to the NC Health Alert Network (NC HAN).

NC State Animal Response Team (SART)

www.sartusa.org

SART is an interagency state organization dedicated to preparing, planning, responding and recovering during animal emergencies in the United States. The national website provides links to state websites, news events and volunteer and training opportunities.

NC State University, College of Veterinary Medicine, Vector Borne Disease Diagnostic Laboratory (VBDDL)

www.cvm.ncsu.edu/vth/ticklab.html

The Vector Borne Disease Diagnostic Laboratory at NCSU CVM assists in the diagnosis of vector-borne diseases in animals.

NC State University, College of Veterinary Medicine News

<http://www.cvm.ncsu.edu/news/2012-09-17-CVM-Research-Finds-Antibiotic-Resistant-Pathogens-Persist-in-Antibiotic-Free-Pigs.html>

Current news on research conducted at NCSU CVM on antimicrobial resistant bacteria and the environment.

North Carolina Veterinary Response Corps (NCVRC)

www.ncvrc.org

Through this program, veterinarians and veterinary technicians are trained to improve preparedness and response to disaster events that affect animals. The NCVRC is a program of the NC Department of Agriculture & Consumer Services.

North Carolina Wildlife Resource Commission (WRC)

www.ncwildlife.org

The WRC has been dedicated to the wise use, conservation, and management of the state’s fish and wildlife resources.

OIE—World Organization for Animal Health

www.oie.int/eng/en_index.htm

The need to fight animal diseases at the global level led to the creation of the Office International des Epizooties (OIE) through the International Agreement signed on January 25, 1924. In May 2003, the Office became the World Organization for Animal Health, but kept its historical acronym OIE. The OIE is the intergovernmental organization responsible for improving animal health worldwide.

Southeastern Center for Emerging Biologic Threats (SECEBT)

<http://www.secebt.org/conferences/publications.cfm>

SECEBT is an active regional partnership of universities, public health agencies, affiliates and foundations dedicated to combating biologic threats with increasing potential for harm. SECEBT produces publications from its conferences and many current topics including antimicrobial resistance.

Southeastern Cooperative Wildlife Disease Study (SCWDS)

www.uga.edu/scwds/

The state-federal cooperative structure of SCWDS is the most cost efficient means of providing high quality wildlife disease expertise to State and Federal Agencies responsible for this nation’s wildlife and domestic livestock resources.

The Center for Food Security and Public Health (CFSPH), Animal Disease Information

www.cfsph.iastate.edu/DiseaseInfo/default.htm

This website, from the Iowa State University College of Veterinary Medicine’s CFSPH, provides fact sheets, images, Power Point files, and speaker notes for over 100 animal diseases.

United States Agency for International Development (USAID)

www.usaid.gov/about_usaid

The USAID is the principal United States agency to extend assistance to countries recovering from disaster, trying to escape poverty and engaging in democratic reforms.

United States ARMY Veterinary Corps

www.goarmy.com/amedd/vet

The Veterinary Corps website explains the benefits and responsibilities of being an Army veterinarian.

United States Department of Agriculture (USDA)

Animal and Plant Health Inspection Service (APHIS)

www.aphis.usda.gov

The APHIS provides leadership in ensuring the health and care of animals and plants. The agency improves agricultural productivity and competitiveness and contributes to the national economy and the public health.

US Department of Health & Human Services (DHHS)

www.hhs.gov/about/whatwedo.html

The DHHS is the United States government's principal agency for protecting the health of all Americans and providing essential human services, especially for those who are least able to help themselves.

US Department of Health & Human Services, US Food and Drug Administration (FDA)

<http://www.fda.gov/AnimalVeterinary/default.htm>

This website provides links to information about FDA regulatory mission and many topics related to consumer education and animal drug/product development and approvals.

US Department of Homeland Security (DHS)

www.dhs.gov

The DHS website provides information for citizens, first responders, businesses and governments on homeland security and natural disaster emergencies for response personnel and the public.

USDA Wildlife Services

www.aphis.usda.gov/wildlife_damage

The USDA Wildlife Services provides federal leadership expertise to create a balance that allows people and wildlife to coexist peacefully.

University of North Carolina, Center for Public Health Preparedness (UNC CPHP)

cphp.sph.unc.edu

Formerly known as the North Carolina Center for Public Health Preparedness, the UNC CPHP brings together faculty and staff from the UNC Preparedness and Emergency Response Learning Center (PERLC), the North Carolina Preparedness and Emergency Response Research Center (NCPERRC) and projects on pandemic influenza planning, emerging and re-emerging infectious diseases, emergency law, public health surveillance, mental health preparedness, and applied epidemiology.

Veterinarians Without Borders/Veterinaires Sans Frontieres (VWB/VSF)

<http://www.vetswithoutbordersus.org/>

VWB/VSF-Canada is a charitable, humanitarian organization whose mission is to work with those in need to foster the health of animals, people and the environments that sustain us. They welcome as members anyone with animal-health related skills, including non-veterinarians as well as veterinarians.

World Health Organization (WHO)

www.who.int/en

The WHO is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.



WATCH FOR

**Dates for the next
"One Medicine" Symposium in
early December 2013!**

www.OneMedicineNC.org

Speaker presentations, with permission, will be available for download after the symposium at www.OneMedicineNC.org