**President’s Letter**

Dear Colleagues,

I am pleased to welcome you to the Metabolic Syndrome and Associated Diseases: From the Bench to the Clinic Conference. This multidisciplinary forum provides the opportunity to discuss the underlying biological mechanisms that lead to greater potential for diseases such as type 2 diabetes and cardiovascular disease, on the rise in the general population.

Distinguished scientists from government agencies, academia, pharmaceutical and chemical companies, and consulting research organizations will present the state-of-the-art approaches needed to address this public health concern as well as the knowledge gaps and research needs.

The main objectives of this conference include the following:

- Providing a better understanding of metabolic syndrome and associated disease entities, their underlying factors, and mechanisms behind the pathology that could enable the development of safer drugs and understanding of problematic environmental toxicants.
- Serve as a “melting pot” to expose individuals to a syndrome, its associated diseases, challenges in therapeutic interventions, role of toxicity of environmental chemicals or drugs, and mechanisms.

As with all the Society of Toxicology Contemporary Concepts in Toxicology (SOT CCT) conferences, this meeting aims to enhance scientific development and to build improved understanding and dialogue to help create a safer and healthier world.

Enjoy the meeting!

Sincerely,

John B. Morris, PhD, ATS, SOT President

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**Organizing Committee**

**Donna L. Mendrick, PhD, Chair**
US Food and Drug Administration, National Center for Toxicological Research, Silver Spring, MD

**Susan G. Emeigh Hart, VMD, PhD, Co-Chair**
Boehringer Ingelheim Pharmaceuticals Inc., Ridgefield, CT

**Florence G. Burleson, PhD**
BRT Burleson Research Technologies Inc, Morrisville, NC

**Rodney R. Dietert, PhD**
Cornell University, Ithaca, NY

**Kenneth L. Hastings, MPH, DrPH**
Hastings Toxicology Consulting LLC, Mount Airy, MD

**Thomas B. Knudsen, PhD**
US Environmental Protection Agency, Office of Research and Development, Research Triangle Park, NC

**Thaddeus T. Schug, PhD**
National Institute of Environmental Health Sciences, Research Triangle Park, NC

**Lisa Swartz Topor, MD, MMSc**
Warren Alpert Medical School of Brown University, Providence, RI

**Charlene A. McQueen, PhD, ATS**
University of Arizona, Tucson, AZ, SOT Liaison, CCT Conferences Committee

**Paul M.D. Foster, PhD**
National Institute of Environmental Health Sciences, Research Triangle Park, NC, Council Contact
Vision and Background

Metabolic syndrome is defined by a combination of risk factors that can lead to greater potential of type 2 diabetes, obesity, lipid disorders, cardiovascular disease, and other circulatory disorders. There is currently a significant research focus to understand the key pathways that control metabolism, as these pathways would be likely targets of risk factors (e.g., exposure to xenobiotics, genetics) and lifestyle factors (e.g., microbiome, nutrition, and exercise). Understanding these pathways also can lead to the development of pharmaceutical interventions. Individuals with metabolic syndrome have signs similar to that of toxic responses (e.g., oxidative stress and inflammation) and organ dysfunction. Given the rapidly growing incidence of this syndrome, it is critical to understand these widespread abnormalities as it changes our definition of “normal.” This syndrome can be driven by fat accumulation around intra-abdominal sites (possibly driven by genetic and epigenetic factors leading to predisposition of retaining fat at this site due to poor intra-uterine growth), organ impairment (e.g., non-alcoholic fatty liver disease), and exposure to xenobiotics. While the causes for escalation in the individual risk factors are multiple and complex, there is no clear recognition of the bridges that unite these risk factors to yield increased disease. Indeed, it is likely that there are pathways that are of importance to controlling metabolism that would be targets of both environmental chemicals and pharmaceutical interventions. A multidisciplinary approach to understand the underlying biological mechanisms and translate that knowledge into prevention and treatment is required.

This meeting will examine, in the morning, current knowledge on metabolic diseases including developmental aspects and challenges in therapeutic strategies for associated diseases. A poster session during lunch will provide a forum for data and hypothesis exchange. The afternoon will be devoted to a discussion of mechanisms thought to play important roles in the syndrome/diseases and provide insight into drugs and environmental agents thought to influence them. Our focus on understanding the pathways and risk factors leading to disease and how these pathways can be perturbed to develop drugs for disease interventions creates a unique combination that is likely to lead to new thought processes and scientific collaborations in addition to defining knowledge gaps, identifying research needs, protecting public health, and empowering product development.
Program

8:45 AM–9:00 AM
WELCOME: INTRODUCTIONS, OVERVIEW, AND GOALS OF THE MEETING
Donna Mendrick, PhD, US FDA/NCTR, Silver Spring, Maryland

9:00 AM–10:00 AM
KEYNOTE LECTURE—METABOLIC DISEASES: CLINICAL MANIFESTATIONS, ROLE OF GENETICS, AND LIFESTYLES
Anna Mae Diehl, MD, Florence McAlister Professor of Medicine, Duke University, Durham, North Carolina
The keynote lecture will provide an overview of the metabolic syndrome and some of its causative modalities and end with a focus on liver damage.

10:00 AM–11:15 AM
PLENARY SESSION I—DEVELOPMENTAL ASPECTS RELATED TO METABOLIC DISEASE
Speakers will discuss the effects of metabolic dysfunction on normal development.
Chair: Kenneth L. Hastings, MPH, DrPH, Hastings Toxicology Consulting LLC, Mount Airy, Maryland

10:00 AM–10:30 AM
Obesity in Children: Underlying Causes and Consequences
Lisa Swartz Topor, MD, MMSc, Alpert Medical School, Brown University, Providence, Rhode Island

10:30 AM–10:45 AM
Break

10:45 AM–11:15 AM
Development of Neuroendocrine Systems Governing Energy Homeostasis
Sebastien Bouret, PhD, Keck School of Medicine, University of Southern California, Los Angeles, California

11:15 AM–12:45 PM
PLENARY SESSION II—DISEASES ASSOCIATED WITH METABOLIC SYNDROME AND CHALLENGES IN THERAPEUTIC STRATEGIES
Metabolic syndrome is associated with many pathologies and, in itself, is a “toxic” environment. This session will focus on some examples of such diseases and challenges seen in drug development.
Chair: Thaddeus T. Schug, PhD, NIEHS, Research Triangle Park, North Carolina

11:15 AM–11:45 AM
Overview of Metabolic Syndrome Associated Obesity and Treatments
Robert E. Ratner, MD, Georgetown University Medical Center, Washington, District of Columbia
11:45 AM–12:15 PM  
Drug Development for Treatment of Diabetes: Experiences with Preclinical Tumor Findings for an SGLT2 Inhibitor  
Mark D. Johnson, PhD, Janssen Pharmaceutical Company, Raritan, New Jersey  

12:15 PM–12:45 PM  
Overview of Cardiovascular Disease and Drug Development  
Norman Stockbridge, MD, PhD, US Food and Drug Administration/Center for Drug Evaluation and Research, Silver Spring, Maryland  

12:45 PM–2:15 PM  
LUNCH AND POSTER SESSION  

2:15 PM–5:15 PM  
PLENARY SESSION III—CELLULAR MECHANISMS AND PATHOPHYSIOLOGY  
The sessions above will acquaint the audience with some of the mechanisms behind these abnormalities, the similarity with environmental agents, and the influence of the microbiome.  
Chair: Susan G. Emeigh Hart, VMD, PhD, Boehringer Ingelheim Pharmaceuticals Inc., Ridgefield, Connecticut  

2:15 PM–2:45 PM  
Mitochondrial Dysfunction and Metabolic Syndrome—Are Genetics, Drug, and Environmental Toxins Responsible?  
Yvonne Will, PhD, Pfizer, Groton, Connecticut  

2:45 PM–3:15 PM  
Fat As an Inflammatory Tissue  
Rodney R. Dietert, PhD, Cornell University, Ithaca, New York  

3:15 PM–3:45 PM  
Metaorganismal Endocrinology: Gut Microbial Metabolites as Postprandial Hormones Impacting Metabolic Disease Effects  
Jonathan Mark Brown, PhD, Cleveland Clinic, Lerner Research Institute, Cleveland, Ohio  

3:45 PM–4:00 PM  
Break  

4:00 PM–4:30 PM  
Environmental Agents and Drugs That May Affect Metabolic Syndrome and Associated Diseases  
Michele La Merrill, PhD, University of California Davis, Davis, California  

4:30 PM–5:00 PM  
Risk Assessment of Environmental Agents  
Carrie R. Fleming, PhD, Dow AgroSciences, Indianapolis, Indiana  

5:00 PM–5:30 PM  
Wrap Up and Discussion  
Florence Burleson, PhD, BRT Burleson Research Technologies, Inc., Morrisville, North Carolina
Poster Information

Poster Presentation Instruction/Times
Posters are available for viewing for the duration of the meeting. Poster presentations will occur from 12:45 pm–2:15 pm during a Lunch and Poster Session.

Poster Set-Up and Removal Times
Posters can be mounted on Saturday, March 11, 2017, beginning at 7:30 am and must be taken down by 6:00 pm on that date.

Online Material

Access Materials Online
www.toxicology.org/metabolic

Invited Speaker and Poster Presentation Abstracts • Program • Attendee List
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