**Health Effects and Mitigation of Arsenic: Current Research Efforts and Future Directions**

**Agenda**

**March 3-4, 2014**
**NIEHS Main Campus, Rall Building, Rodbell A, B, C**
**Research Triangle Park, NC**

**March 3 - Day 1**

7:00 - 8:20 AM
Registration and Poster set-up (Rodbell Lobby)
8:20 AM
Opening Remarks
Dr. Danielle Carlin, *NIEHS*
8:30 AM
Welcome and Charge for Day 1
Dr. Linda Birnbaum, *NIEHS*
8:45 - 9:15 AM
Plenary Presentation (Moderator: Dr. Linda Birnbaum, *NIEHS*)
Dr. Carol Folt, Chancellor, *University of North Carolina*

**Session 1: Global Environmental Cycling and Bioavailability of Arsenic**
**Moderator: Dr. Karen Bradham *USEPA***

9:15 - 9:35 AM
Environmental Triggers of Arsenic Well Water Contamination
Dr. Matthew L. Polizzotto, *North Carolina State University*
9:35 - 9:55 AM
From the Soil to the Seed: Arsenic in Rice
Dr. Mary Lou Guerinot, *Dartmouth College*
9:55 - 10:15 AM
Dietary Arsenic - What Don't We Know?
Dr. Margaret Kurzius-Spencer, *University of Arizona*

**10:15 - 10:30 AM Break**

10:30 - 10:50 AM
Incidental Ingestion of Arsenic Contaminated Soil and Dust: Refining Exposure Through the Assessment of Relative Bioavailability and Bioaccessibility
Dr. Albert Juhasz, *University of South Australia*

**10:30 - 12:00 PM Panel Discussion**
**Moderator: Dr. David Thomas *USEPA***

Questions for Session 1: Global Environmental Cycling and Bioavailability of Arsenic

1. Are data sufficient to allocate exposures to different sources in U.S. populations or in other populations?
2. How do we assess the bioavailability/bioaccessibility of arsenic from different sources?

3. Do we have satisfactory biomarkers to assess arsenic exposure in humans?
4. Do available models adequately represent aggregate exposure to arsenic? What is limiting - the model or the data?
5. Is understanding As speciation in the environment more relevant for exposure/risk assessment or determining fate and transport?

Panelists for Session 1:

- Dr. Matthew L. Polizzotto *North Carolina State University*
- Dr. Mary Lou Guerinot *Dartmouth College*
- Dr. Margaret Kurzius-Spencer *University of Arizona*
- Dr. Albert Juhasz *University of South Australia*
- Dr. Scott Fendorf *Stanford University*
- Dr. Mary Kay O'Rourke *University of Arizona*

**12:00 - 1:00 PM Lunch (NIEHS Cafeteria; lunch for purchase)**

**Session 2: Susceptibility to Arsenic Effects**
**Moderator: Dr. Janice Lee *USEPA***

1:00 - 1:20 PM
Developmental Effects of Arsenic
Dr. Carmen Marsit, *Dartmouth College*
1:20 - 1:40 PM
Genetics for Arsenic: Role for Metabolism and Toxicity
Dr. Karin Engström, *Lund University, Lund, Sweden*
1:40 - 2:00 PM
Effects of Prenatal Arsenic Exposure on DNA Methylation
Dr. Molly Kile, *Oregon State University*
2:00 - 2:20 PM
Arsenic and Susceptibility to Cardiometabolic and Liver Disease
Mr. Eric Ditzel, *University of Arizona*

**2:20 - 3:30 PM Panel Discussion**
**Moderator: John Cowden *USEPA***

Questions for Session 2: Susceptibility to Arsenic Effects

1. What types of mechanistic data are needed to identify novel susceptibility pathways for inorganic arsenic exposure?
2. What types of mechanistic data on susceptibility are needed to inform the dose-response relationship for human health effects related to inorganic arsenic exposure? (e.g. variability in response to a particular dose)
3. What methods/data are needed to identify susceptible individuals/populations? Alternatively, what types of data are needed to consider a mechanistic event a "biomarker" of susceptibility?
4. What types of susceptibility information are needed to inform cumulative risk for individual/populations?
5. What mechanistic data are needed to inform susceptible lifestage exposures, particularly the late onset of health effects following early life exposure?

6. What is the impact of the different susceptibility factors on epigenetic regulation? Which factor or factors have the biggest impact on arsenic susceptibility?

Panelists for Session 2:

- Dr. Carmen Marsit, *Dartmouth College*
- Dr. Karin Engström, *Lund University, Lund, Sweden*
- Dr. Molly Kile, *Oregon State University*
- Mr. Eric Ditzel, *University of Arizona*
- Dr. Craig Steinmaus *University of California Berkeley*
- Dr. Andrea Allan *University of New Mexico*

**3:30 - 5:00 PM Trainee Poster Session**

**6:30 - 8:00 PM Dinner with Workshop Participants (Dinner for purchase)**

Dinner Reservations have been made at Page Road Grill (5416 Page Road, Durham, NC 27703; 919-908-8902) and Mez (5410 Page Road, Durham, NC 27703, 919-941-1630). If you would like to be added to the list, please R.S.V.P. to Ms. Rosemary Moody by February 24, 2014. (Please note that space is limited to 35 people for each restaurant).

**March 4 - Day 2**

8:30 - 8:40 AM
Charge for Day 1
Dr. William Suk, *NIEHS*

**Session 3: Contributions of Advanced Techniques to Understanding Arsenic in Health and the Environment**
**Moderator: Dr. Claudia Thompson *NIEHS***

8:40 - 9:00 AM
Pathways of Exposure to Arsenic
Dr. Miranda Loh, *University of Arizona*
9:00 - 9:20 AM
Combined Arsenic and Fluoride Exposure
Dr. Luz Maria Del Razo Jiménez, *Cinvestav, Mexico*
9:20 - 9:40 AM
Functional Interactions Between the Gut Microbiome and Arsenic Exposure
Dr. Kun Lu, *University of Georgia*
9:40 - 10:00 AM
Field-Deployable Arsenic Sensor to Assess Personal Exposure
Dr. Badawi Dweik *Giner, Inc.*

**10:00 - 10:15 AM Break**

**10:15 - 11:30 AM Panel Discussion**
**Moderator: Dr. Mike Waalkes *NIEHS***

Questions for Session 3: Contributions of Advanced Techniques to Understanding Arsenic in Health

1. What are the best for samples to assess acute arsenic exposure in humans?
2. What are the best for samples to assess chronic arsenic exposure in humans?
3. What biomarkers are best predict human arsenic-induced diseases?
4. Are there disease specific biomarkers?
5. What is the impact of the microbiome on arsenic? Does the microbiome alter arsenic metabolism?

Panelists for Session 3:

- Dr. Miranda Loh, *University of Arizona*
- Dr. Luz Maria Del Razo Jiménez, *Cinvestav, Mexico*
- Dr. Kun Lu, *University of Georgia*
- Dr. Badawi Dweik *Giner, Inc.*
- Dr. Barry Rosen *Florida International University*
- Dr. Maria Argos *University of Chicago*

**11:30 - 12:30 PM Lunch (NIEHS Cafeteria; lunch for purchase)**

**12:30 - 2:00 PM Trainee Poster Session**

**2:00 - 3:20 PM Session 4: Prevention and Remediation Strategies for Arsenic Exposure**
**Moderator: Dr. Michelle Heacock *NIEHS***

2:00 - 2:20 PM
The Influence of Nutrition on Arsenic Metabolism
Dr. Megan Nina Hall *Columbia University*
2:20 - 2:40 PM
Topic: Remediation
Dr. Julie Zimmerman *Yale University*
2:40 - 3:00 PM
Phytostabilization of Arsenic in Mining Wastes
Dr. Raina Maier *University of Arizona*
3:00 - 3:20 PM
Reducing Arsenic Exposure from Drinking Well Water in South and Southeast Asia: Obstacles and Opportunities
Dr. Alexander Van Geen *Columbia University*

**3:20 - 4:20 PM Panel Discussion**
**Moderator: Dr. Heather Henry**

Questions for Session 4: Prevention and Remediation Strategies for Arsenic Exposure

1. What are the biggest challenges and opportunities for preventing arsenic exposures?
2. What are the major exposure routes and environmental media that need to be considered for prevention?
3. How can communities be made aware of potential exposure to arsenic and opportunities for prevention?
4. What types of prevention/remediation options are needed considering each exposure route? and each media?
5. Should blanket testing of private wells for As throughout the US be offered or imposed?
6. Arsenic is an interesting toxicant because much of the exposure occurs from natural sources; do you see some exposures occurring because of anthropogenic processing (e.g., mining)?

Panelists for Session 4:

- Dr. Megan Nina Hall *Columbia University*
- Dr. Julie Zimmerman *Yale University*
- Dr. Raina Maier *University of Arizona*
- Dr. Alexander Van Geen *Columbia University*
- Dr. Mary Gamble *Columbia University*

4:20 - 4:30 PM
Closing Remarks & Poster Award Announcements
Dr. Gwen Collman *NIEHS*