

Special Seminar & Networking Opportunities  
Sponsored by the Superfund Research Program, NIEHS  
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## **The Astonishing Long-Term Effects of In Utero & Early Childhood Exposure to Arsenic**

**Allan H. Smith, MD, PhD**

Director, Arsenic Health Effects Research Program  
Professor of Epidemiology, School of Public Health  
**University of California, Berkeley**

Monday

October 3, 2011

**Seminar: 10:00 – 11:30 am**

Chamblee 106 1A/B

Informal Lunch with Speaker

11:30 am – 12:30 pm

Chamblee 106 Cafeteria

Office Hours: 12:30 – 2:00 pm

By Appointment

Centers for Disease Control and Prevention

Chamblee Campus

4770 Buford Highway NE

Atlanta, GA 30341-3717

Arsenic in drinking water is an established cause of cancers of the skin, lung and bladder, and evidence suggests that ingested arsenic may also cause nonmalignant lung disease. Antofagasta is the second largest city in Chile and had a distinct period of very high arsenic exposure that began in 1958 and lasted until 1971, when an arsenic removal plant was installed. This unique exposure scenario provides a rare opportunity to investigate the long-term mortality impact of early-life arsenic exposure. We compared mortality rates in Antofagasta in the period 1989-2000 with those of the rest of Chile, focusing on subjects who were born during or just before the peak exposure period and who were 30-49 years of age at the time of death. Mortality from laryngeal cancer, lung cancer and bladder cancer were increased more than 5-fold, the highest SMR being for bladder cancer (SMR-21.3,  $p < 0.001$ ). More than

2-fold increases in non-cancer mortality rates were found for acute myocardial infarction and chronic renal failure. The highest non-cancer mortality SMR was for bronchiectasis (SMR=25.1, p<0.001). These findings suggest that exposure to arsenic in drinking water during early childhood or in utero has major effects on subsequent mortality in young adults from both malignant and nonmalignant causes of death, beyond the effects attributable to any other human environmental exposure.

**Dr. Allan H. Smith** established the Arsenic Health Effects Research Program at Berkeley, which conducts epidemiological studies with multiple international collaborators in remote populations in Argentina, Chile, Bangladesh, India, Nepal, as well as the United States. Dr. Smith's research group emphasizes practical solutions to assist exposed populations, such as creating the nonprofit organization Project Well, a pilot intervention program in West Bengal, India, that provides arsenic-free water to rural communities. His research has shown:

- Person to person variation in arsenic metabolism: potential susceptibility to health effects;
- Dose-response relationship between arsenic exposure & bladder cell micronuclei, a marker of genetic damage to bladder cells which may relate to cancer risks;
- Decreased urinary beta-defensin-1 expression as a biomarker of response to arsenic;
- How lung function in adults may be affected by in utero & childhood exposure to arsenic in drinking water;
- Arsenic in drinking water contributes to susceptibility to pulmonary tuberculosis;
- Relationship between creatinine, diet, micronutrients (selenium, folate), & arsenic methylation.

**Learn more about his research & publications!**

<http://www.ncbi.nlm.nih.gov/pubmed?term=Smith%2C%20Allan%20H%5BFull%20Author%20Name%5D&cmd=DetailsSearch>  
<http://asrg.berkeley.edu/>

[http://tools.niehs.nih.gov/srp/programs/Program\\_detail.cfm?Project\\_ID=P42ES47050016&FY=2011](http://tools.niehs.nih.gov/srp/programs/Program_detail.cfm?Project_ID=P42ES47050016&FY=2011)  
<http://superfund.berkeley.edu/research-projects/project-3-arsenic-biomarker-epidemiology/>

SRP Berkeley: <http://superfund.berkeley.edu/>

Questions about these events? Contact Olivia Harris at 770-488-0597. Local partners outside CDC who wish to attend in person should contact [OHarris@cdc.gov](mailto:OHarris@cdc.gov) for security clearance (1 week notice for US citizens; 2 weeks for non-citizens). These events will not be ENVISIONED. Employees outside Atlanta and state/local partners may participate in the 10 am seminar via LiveMeeting on the internet. Please contact Sandra Gosnell ([SGosnell@cdc.gov](mailto:SGosnell@cdc.gov)) for passcodes. Since the number of webports is limited, Chamblee campus employees should please attend in person.

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**Agency for Toxic Substances & Disease Registry**  
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