



Risk Assessment Careers at the US EPA

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**Office of Research and Development | US Environmental Protection Agency
Society of Toxicology
Postdoctoral Assembly webinar
May 31, 2018**

The views expressed in this presentation are that of the presenter and do not represent the views and/or policies of the US Environmental Protection Agency.

Conflict of Interest Disclosures

I have no actual or potential conflict of interest to disclose in relation to this presentation.

My Path to Risk Assessment

EDUCATION:

- Bates College (BS in Biology)
- SUNY Buffalo (PhD in Oral Biology)

• DABT/ATS

NIOSH/CDC:

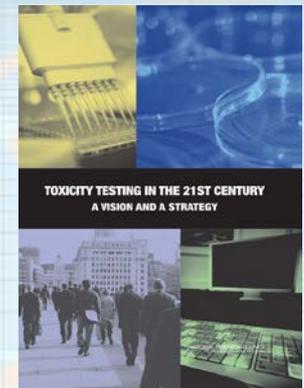
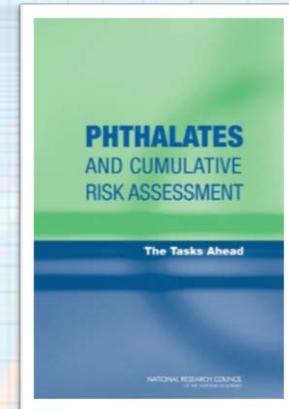
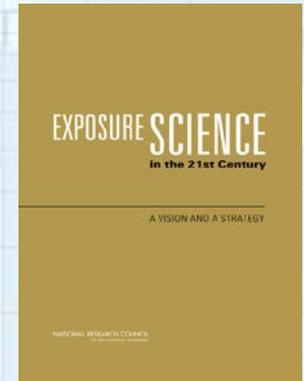
- NRC Postdoctoral Fellowship
 - Cancer research, gene expression analysis
- Postdoctoral Fellowship
 - Cancer and toxicology research on particles/fibers

US EPA:

- National Center for Environmental Assessment
- National Center for Computational Toxicology

What do Risk Assessors Do?

- Develop mechanistic understanding of effects
- Ensure safer chemical products
- Develop safer drugs & medicines
- Determine risks from chemical exposures
- Develop treatments for chemical exposures
- Ensure a safe food and water supply
- Protect public health and the environment



Skills Required for the Job

SCIENCE AND DECISIONS

Advancing Risk Assessment

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

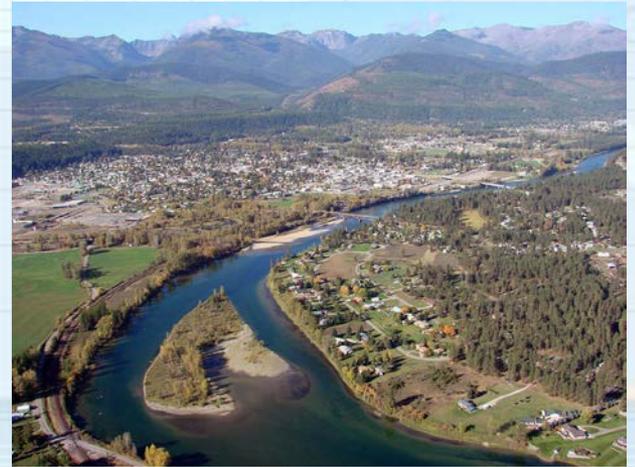
The National Academy of
SCIENCES-ENGINEERING-MEDICINE
REPORT

USING 21ST CENTURY SCIENCE TO IMPROVE RISK-RELATED EVALUATIONS

- Strong science background
- Regulatory knowledge
- Public health knowledge
- Critical thinking
- Problem-solving
- Decision-making
- Oral and written Communication

Inform Superfund Clean-up

- Libby, Montana is the location of a former vermiculite mine that operated from 1923 to 1990. The vermiculite ore from the mine co-existed with amphibole asbestos, referred to as Libby Amphibole Asbestos (LAA).
- EPA placed the site on the Superfund National Priorities List (NPL) in 2002, and this site was declared a public health emergency in 2009.
- To better understand the health effects of LAA, EPA researchers conducted and evaluated toxicity studies on asbestos which were used to inform a toxicity assessment on Libby Amphibole asbestos in 2014.
- A final risk assessment for the site was completed in 2015, and investigation and cleanup of the majority of the site is expected to be complete in 2018.



Respond to Community Emergencies

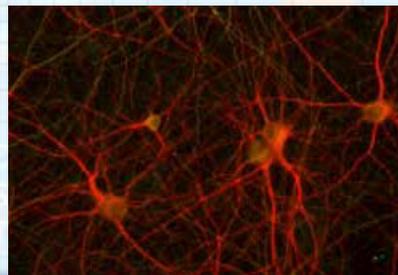
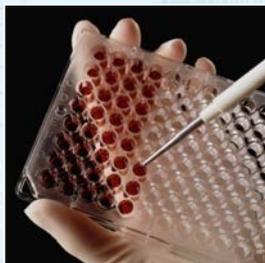
- In August 2014, Ohio EPA and the City of Toledo requested ORD's technical assistance to analyze drinking water for the presence of cyanobacterial toxins resulting in a harmful algal bloom.
- ORD helped **identify the best approach for controlling cyanobacterial toxins** in the treatment plant and the distribution system.
- **Scientists provided rapid, crucial scientific assistance to inform the “Do Not Drink” order** that the City of Toledo issued for approximately 500,000 people.
- We then provided critical information to the Mayor of Toledo and the Governor of Ohio to help them make the decision to lift the “Do Not Drink” order.



“When we were faced with an emergency in Toledo due to cyanobacterial toxins detected in their treated drinking water, ORD staff was a great partner and exceeded our expectations in understanding science and helping optimize treatment and restore safe drinking water to our residents.” — Ohio EPA Director Craig Butler

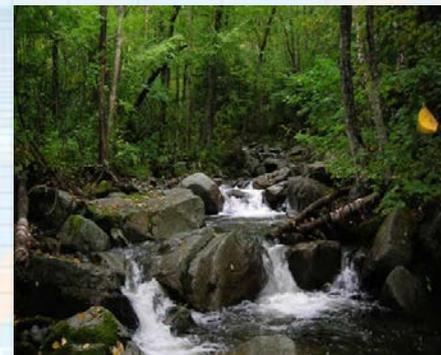
Accelerate the Pace of Chemical Evaluation

- **High-throughput toxicology – increasing biological coverage and efficiency**
 - Early exploratory activity to apply functional genomic and proteomic screening approaches
 - Fully implemented, would rapidly test new chemicals and identify high-affinity targets of selective compounds, identify modes of toxicity of less selective chemicals and find chemicals with low intrinsic bioactivity
 - Use of functional screens, particularly with primary cells, would also ground the outcomes to expected *in vivo* effects
- **Advanced exposure measurement**
 - Supporting development of untargeted screening for chemical occurrence in biological and environmental media
 - Developing methods for effects-based biomonitoring



Advantages and Challenges

- Safer chemicals
- Cleaner environment
- Policy implications
- Multiple stakeholders
- Public health impact



Toxicology Informs Decisions

The PRESS

NEWSPAPER - PUBLICATIONS -

The Intelligencer



Congress budget deal sets table for \$7M PFAS study

Harmful algal bloom i

Written by J. Patrick Eaken
February 16, 2018
Hits: 472

Montana preparing to take over after \$600M EPA asbestos cleanup near Libby

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The Ohio Depart additional projects in

HABRI is a state Toledo drinking water water supplies for me

Associated Press Sep 21, 2017

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Widespread asbestos contamination has killed an estimated 400 people in

ChemicalWatch

GLOBAL RISK & REGULATION NEWS

ToxCast and Tox21 high-throughput data identify potential EDCs

Fifra SAP set to discuss androgen receptor model

23 November 2017 / Alternative approaches to testing, EDCs, United States

The New York Times | <https://nyti.ms/KIDgRu>

U.S.

Thousands Without Water After Spill in West Virginia

By TRIP GABRIEL JAN. 10, 2014

CHARLESTON, W.Va. — As 300,000 people awoke on Friday to learn that their tap water was unsafe for brushing teeth, brewing coffee or showering, residents and businesses expressed a mix of anger and anxiety in coping with an industrial accident with no clear end in sight.

Schools were closed, restaurants locked their doors and hotels refused reservations. Store shelves were quickly stripped of bottled water, and traffic snarled as drivers waited to fill jugs from tankers delivered by the National Guard.

OW AGENCY

Thank you for your attention!



GTCTCTTAA... CGGATGTTCA... ACCAAAAGCT... ACTTACTACC... TTTATTTTAT... GTTACTTTT... TATA
TCGCTTGTGC... CGTSCAACAA... ACACTAAATC... AAAAAGTGA... AATAGACTA... CATCAAAACG... CATA
CTAGACAATA... CATAATGACT... GACTTTCGTA... ACAACAATT... CTTCACTCT... CCAACTTCTC... TGCT