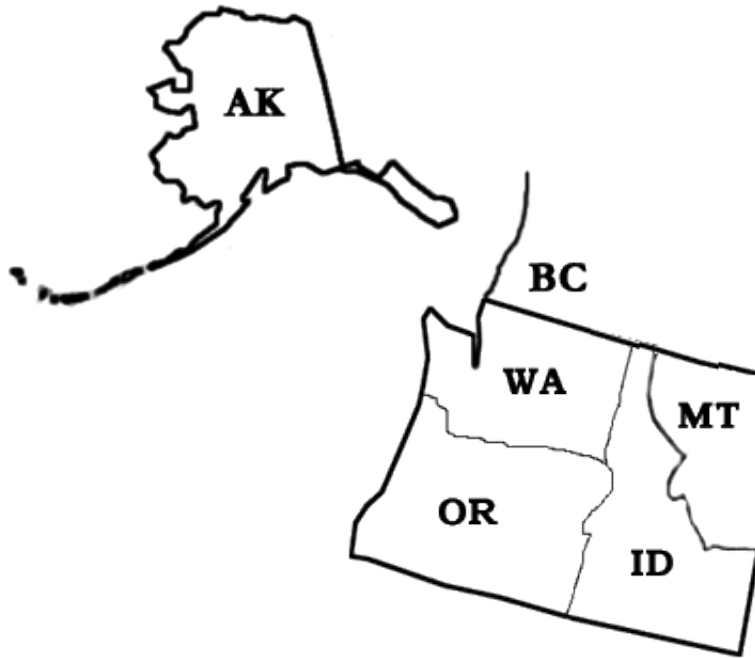


***Toxicology Research in Idaho:
Imagine what we can do!***

Kristen Mitchell, Boise State University
Jean Pfau, Idaho State University

Regional chapters of the Society of Toxicology:

PACIFIC NORTHWEST (PANWAT)



MOUNTAIN WEST



How might we move forward?

- Create site on Google Apps to increase communication
- Create an “expert list” that describes:
 - Your area of research or expertise
 - Techniques that you regularly use
- Increase participation in SOT
- Consider having a future SOT regional chapter meeting in Idaho

Toxicology:

“Toxicology is the study of the adverse effects of chemical, physical or biological agents on living organisms and the ecosystem, including the prevention and amelioration of such adverse effects.”

Society of Toxicology, 2005

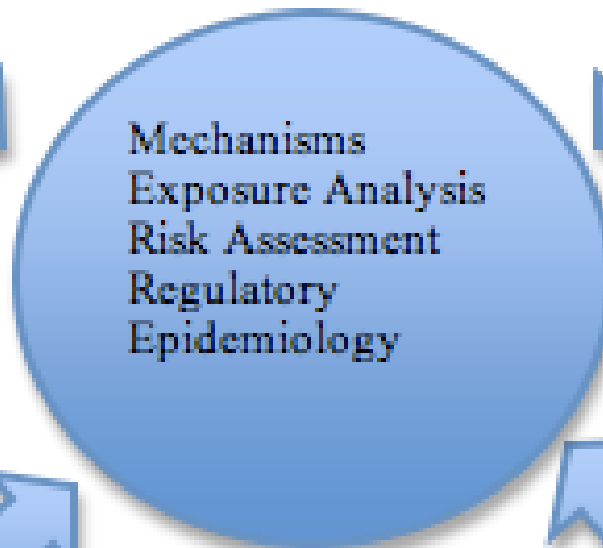
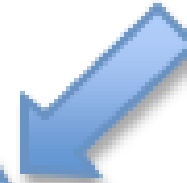
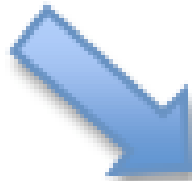


“Substances often considered toxic can be benign or beneficial in small doses, and conversely an ordinarily benign substance can be deadly if over-consumed. Even water can be deadly if over-consumed.”

Phillip von Hohenheim

Biomedical

Ecological

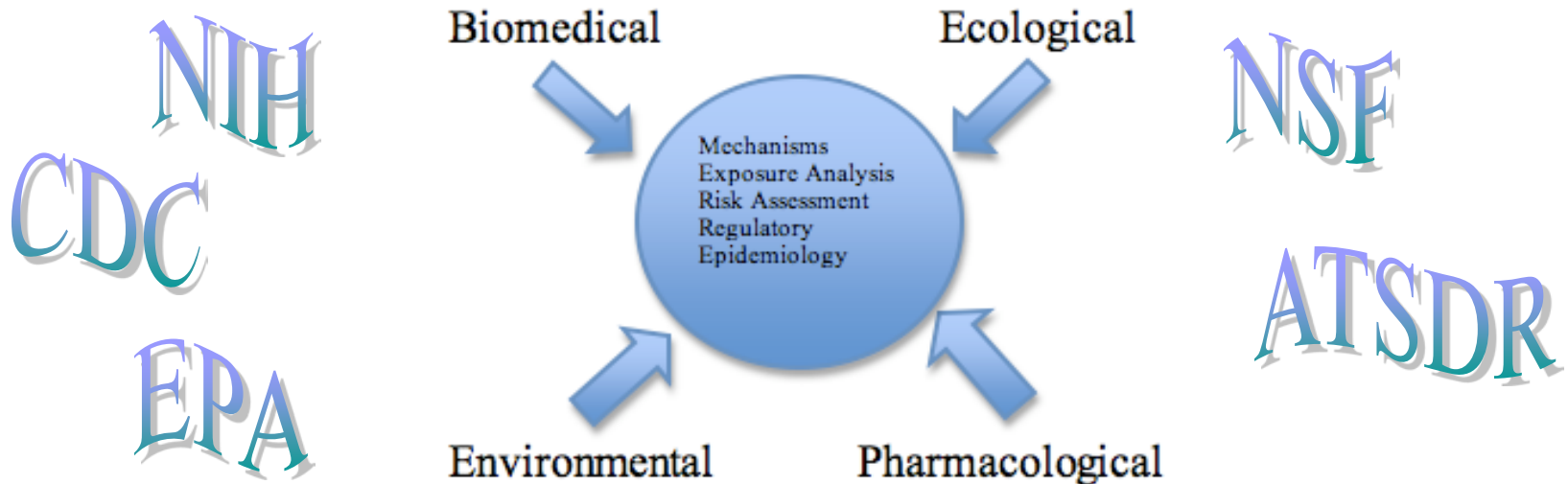


Environmental

Pharmacological

Challenges in Funding for Toxicology Research

- Uncertainties about what it is
 - * Is it just the science of poisons & poisoning?
- Perceived as “softer” science, or “descriptive” (not molecular)
- No sense of “ownership” by the funding agencies





U.S. Department of Health & Human Services



National Institutes of Health

The Nation's Medical Research Agency



NIEHS

National Institute of
Environmental Health Sciences

"Transla

Partnerin



National Institutes of Health

National Institute for Environmental Health Sciences



The current focus of NIEHS research includes:

- Molecular Mechanisms of Exposure-Disease Relationships
- Endocrine Disruptors and Reproductive Disorders
- Exposure Biology Program
- Environmental Public Health Research
- Climate Change
- Hazardous substances research, including effects of air pollutants, metals, and synthetic chemicals

Some of the most active areas of research are:

- Breast cancer and the environment
- Gene-environment interaction and genetic susceptibility
- Childhood environmental health, including respiratory diseases, birth defects, and autism
- Environmental public health research
- Alzheimer's and Parkinson's disease

National Institutes of Health

National Institute for Environmental Health Sciences

Epigenetics - Gene expression/regulation across organ systems (Jerry Heindel)
bioinformatics
gene/environment interactions (Les Reinlib)

Developmental - Early exposure (including in utero & even transgenerational)
FeBAd - Fetal Basis of Adult Disease
aging/genetics/environment (Jerry Heindel)
immune system (Pat Masten, Mike Humble)
children/environment, personal exposure assessment (Kimberly Gray)

Nano-particles/technologies (David Balshaw)

www.niehs.nih.gov/funding/grants/contacts.cfm

National Institutes of Health

Center for Scientific Review (CSR)

<http://cms.csr.hin.gov/peerreviewmeetings/csringdescriptionnew/>

Integrated Review Groups

Study Sections

- * AARR - AIDS and Related Research
- * BBBP - Biobehavioral and Behavioral Processes
- * BCMB - Biological Chemistry and Macromolecular Biophysics
- * BDA - Biology of Development and Aging
- * BDCN - Brain Disorders and Clinical Neuroscience
- * BST - Bioengineering Sciences and Technologies
- * CB - Cell Biology
- * CVRS - Cardiovascular and Respiratory Sciences
- * DKUS - Digestive, Kidney and Urological Systems
- * EMNR - Endocrinology, Metabolism, Nutrition and Reproductive Sciences
- * ETTN - Emerging Technologies and Training in Neurosciences
- * GGG - Genes, Genomes and Genetics
- * HDM - Healthcare Delivery and Methodologies
- * IDM - Infectious Diseases and Microbiology
- * IFCN - Integrative, Functional, and Cognitive Neuroscience
- * IMM - Immunology
- * IMST - Interdisciplinary Molecular Sciences and Training
- * MDCN - Molecular, Cellular, and Developmental Neuroscience
- * MOSS - Musculoskeletal, Oral and Skin Sciences
- * OBT - Oncology 1 - Basic Translational
- * OTC - Oncology 2 - Translational Clinical
- * PSE - Population Sciences and Epidemiology
- * RPHB - Risk, Prevention and Health Behavior
- * SBIB - Surgical Sciences, Biomedical Imaging, and Bioengineering
- * VH - Vascular and Hematology

Toxicology IRG's of the past:
ALTOX I, II, III
XNDA
SIEE (Systemic Injury by
environmental exposure)

National Institutes of Health

Center for Scientific Review (CSR)

<http://cms.csr.hin.gov/peerreviewmeetings/csringdescriptionnew/>

Integrated Review Groups

Study Sections

* CB - Cell Biology

- * Biology and Diseases of the Posterior Eye [BDPE]
- * Nuclear and Cytoplasmic Structure/Function and Dynamics Study Section [NCSD]
(Formerly Cell Structure Function - CSF)
- * Cellular Signaling and Regulatory Systems Study Section [CSRS]
- * Intercellular Interactions Study Section [ICI]
- * Membrane Biology and Protein Processing Study Section [MBPP]
- * Molecular and Integrative Signal Transduction study section [MIST]
- * Nuclear Dynamics and Transport Study Section [NDT]
- * Retinopathy Special Emphasis Panel (CB-90)

National Institutes of Health

National Institute for Environmental Health Sciences

NIEHS Strategic Plan - 2006-2011

1. Expand the role of clinical research in environmental health sciences
 - a) Environmental clinical research that emphasizes the use of environmental exposures to understand & better characterize common, complex diseases.
2. Use environmental toxicants to understand basic mechanisms in human biology
 - a) Signal transduction pathways & influence on disease
 - b) Environmental influences on genome maintenance/stability and impact on health
 - c) Understanding epigenetic influences on health
3. Build integrated environmental health research programs to address cross-cutting problems in human biology and disease.
4. Improve and expand community-linked research
5. Develop sensitive markers of exposure, early biological responses & genetic susceptibility
6. Recruit and train the next generation of environmental health scientists.
7. Foster development of partnerships between NIEHS and other agencies, academia, industry, and communities to improve human health.



National Science Foundation
WHERE DISCOVERIES BEGIN

www.nsf.gov/funding/pgm_list.jsp?org=NSF&ord=rcnt

The National Science Foundation funds research and education in most fields of science and engineering. **The Foundation accounts for about one-fourth of federal support to academic institutions for basic research.**

However, NSF specifically avoids research topics that overlap with NIH, such as mechanisms of disease, treatments, or public health.

BUT there are unavoidable overlaps -

- Emerging diseases due to climate change, human activities
- Applications of technologies to healthcare (informatics, nanotechnology, bioengineering)



National Science Foundation
WHERE DISCOVERIES BEGIN

Combined NSF/NIH Opportunities

1. Ecology of Infectious Disease (EID)

NSF 08-601, Due dates in December. Multi-investigator/cross-disciplinary
Predictive models of transmission dynamics of infectious disease
Ecological & socio-ecological determinants of transmission by vectors/abiotic agents
Population dynamics of reservoir species
Can be human, non-human animal, or plant diseases

2. Bioengineering & Bioinformatics Summer Institutes

(BBSI - www.nsf.gov/funding/)

Career Pipeline training program
Tissue Engineering
Biomaterials
Drug Delivery systems
Implants/biosensors
Computational Modeling/Algorithms
Medical Imaging/Image analysis

Toxicology?





Department of Health and Human Services

Centers for Disease Control and Prevention

<http://www.cdc.gov/od/pgo/funding/grants/grantmain.shtm>

<http://www.cdc.gov/od/science/PHResearch/foas.htm>

Office of Public Health Research (OPHR) Funding Opportunity Announcements

CDC and its National Centers and Coordinating Offices support and foster research that creates knowledge, tools and interventions that people and communities need to protect their health through health promotion, prevention of diseases, injury and disability, and preparedness for threats at home and abroad.

The logo for the Agency for Toxic Substances & Disease Registry (ATSDR), featuring the letters "ATSDR" in a white font inside a blue square.

Agency for Toxic Substances & Disease Registry

Goals of ATSDR

www.atsdr.cdc.gov/funding.html

- # Protect the public from environmental hazards and toxic exposures
- # Promote healthy environments
- # Advance the science of environmental public health.
- # Support environmental public health practice
- # Educate communities, partners, and policy makers about environmental health risks and protective measures
- # Promote environmental justice and reduce health disparities associated with environmental exposures.
- # Provide unique scientific and technical expertise to advance public health science and practice.



Clean Air Research Program



Drinking Water Research Program



Ecosystem Services Research Program



Global Change Research Program



Human Health Research Program



Land Research Program



Pesticides and Toxic Substances Research Program



Water Quality Research Program



Science to Achieve Results (STAR) Research Grants

The STAR program funds research grants in numerous environmental science and engineering disciplines. See www.epa.gov/ncer for more information.

Science to Achieve Results (STAR) Graduate Fellowships

The purpose of the fellowship program is to encourage promising students to obtain advanced degrees and pursue careers in environmental fields. www.epa.gov/ncer/fellow.

Greater Research Opportunities (GRO) Undergraduate Fellowships

For more information contact Georgette Boddie, USEPA, or visit www.epa.gov/ncer/fellow.
Email: boddie.georgette@epa.gov

Public Health Fellowships

EPA has partnered with the Association of Schools of Public Health (ASPH) to offer a professional development program for graduates of accredited US Schools of Public Health.

American Association for the Advancement of Science (AAAS) Fellowships

Since 1981, EPA has managed the AAAS Science and Engineering Fellows Program in cooperation with the American Association for the Advancement of Science (AAAS). The fellowship program is designed to provide an opportunity to learn first-hand how scientific and technological information is used in environmental policy-making; http://fellowships.aaas.org/02_Programs/02_Environment.shtml.

For information about how to apply for grants, EPA's grants policies, and other competition information, see:

http://epa.gov/ogd/grants/funding_opportunities.htm.

www.grants.gov

