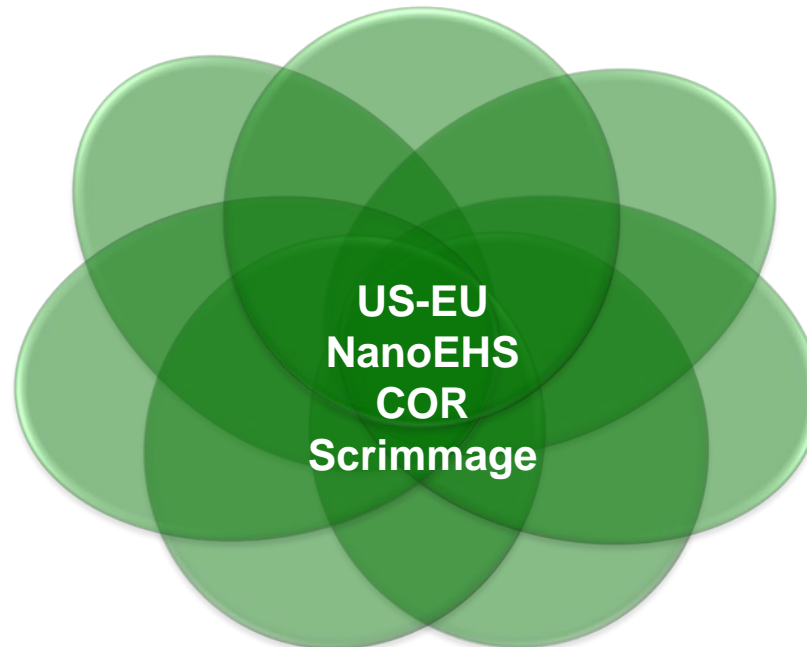


us — eu
bridging nanoEHS research efforts



NanoEHS Scrimmage

Monday 6 June, 2016



Christine Ogilvie Hendren, PhD

Executive Director and Research Scientist

Center for the Environmental Implications of NanoTechnology

<https://nanoehs.enanomapper.net>

2016 NanoEHS Scrimmage COR Member Planning Committee

Risk Assessment COR Co-Chairs

Janeck J. Scott-Fordsmand, University of Aarhus
Christine Ogilvie Hendren, Duke University

Databases and Computational Modeling COR Co-Chairs

Fred Klaessig, Pennsylvania Bio Nano Systems, LLC
Barry Hardy, Douglas Connect (*with special thanks for the NanoEHS web tool development to Lucian Farcas and Maja Brajnik!*)

Human Toxicity US Co-Chair

Gabriele Windgasse, California Department of Public Health

Risk Management and Control COR Member

Mark Hoover, CDC/NIOSH

Risk Assessment COR Member and Science, Technology & Society Anthropologist

Sharon Ku, Drexel University

US-EU NanoEHS COR Scrimmage

What → What is the scrimmage

Why → Brief background and motivation

How → Instructions and outputs

NanoEHS Scrimmage Scenario

An interactive event structured to spark collaborations, sanity checks, and new ideas.

Workshop participants will be divided into two groups of teams.

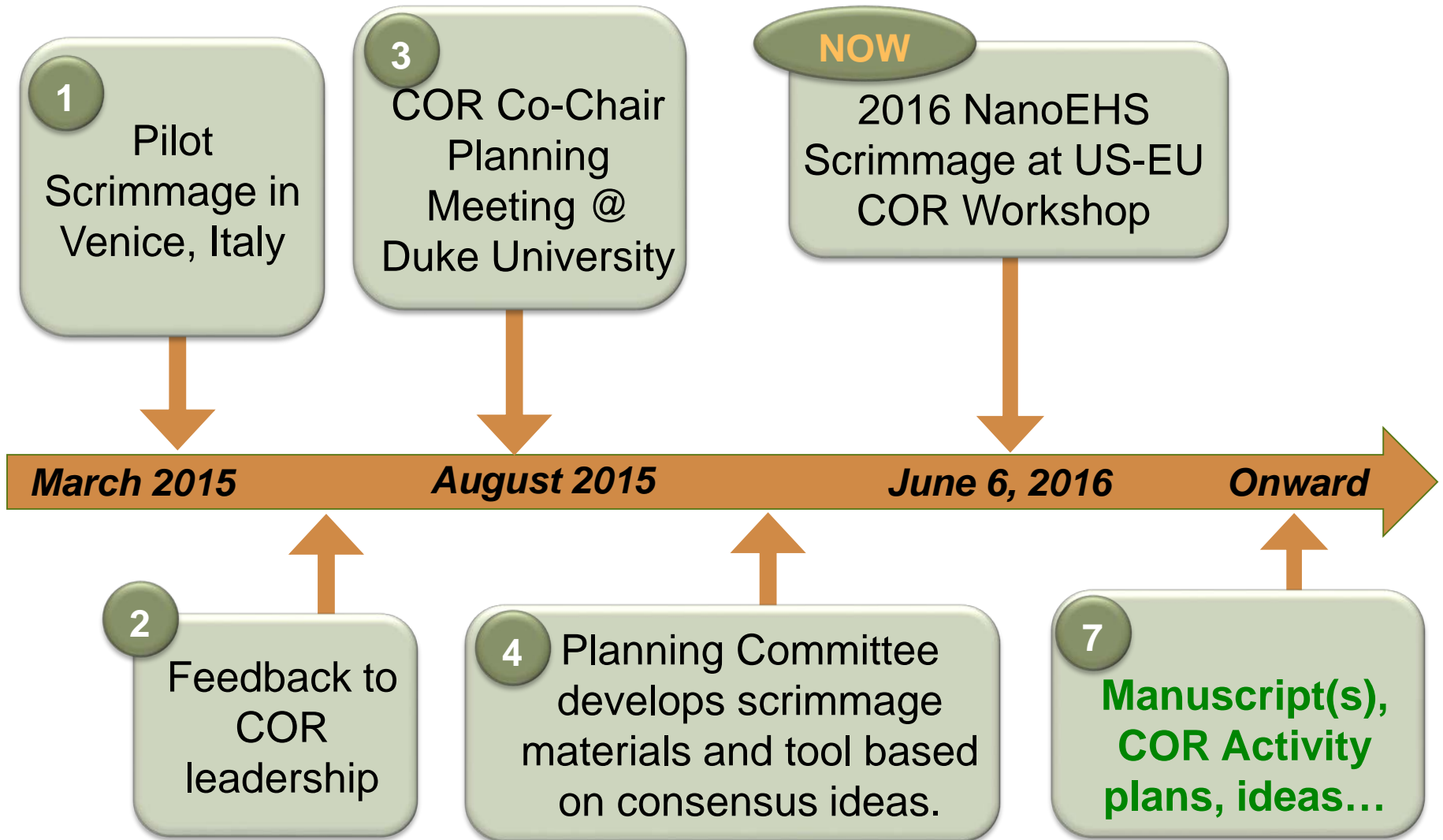
Each group of teams will:

- Be posed with a hypothetical scenario where NanoEHS insight would be relevant
- Be provided with prepared materials and the expertise of other “consultant” CORs
- Prepare for a mock briefing & complete a couple of documents

Disclaimer

The assessments and scenario responses developed as part of this exercise **are not intended to serve as actual policy recommendations**; rather, the activity is intended to generate insight pertaining to the process of arriving at a collective answer in response to the simulated challenge.

History



Background and Motivations

- To extract from the mental habits of traditional meetings and disciplines, spark creativity
- Cross-COR interactions
 - To facilitate knowledge synthesis
 - To navigate boundaries of knowledge and communication
 - Between disciplines
 - Between the nanoEHS community and a variety of stakeholder groups

Background and Motivations

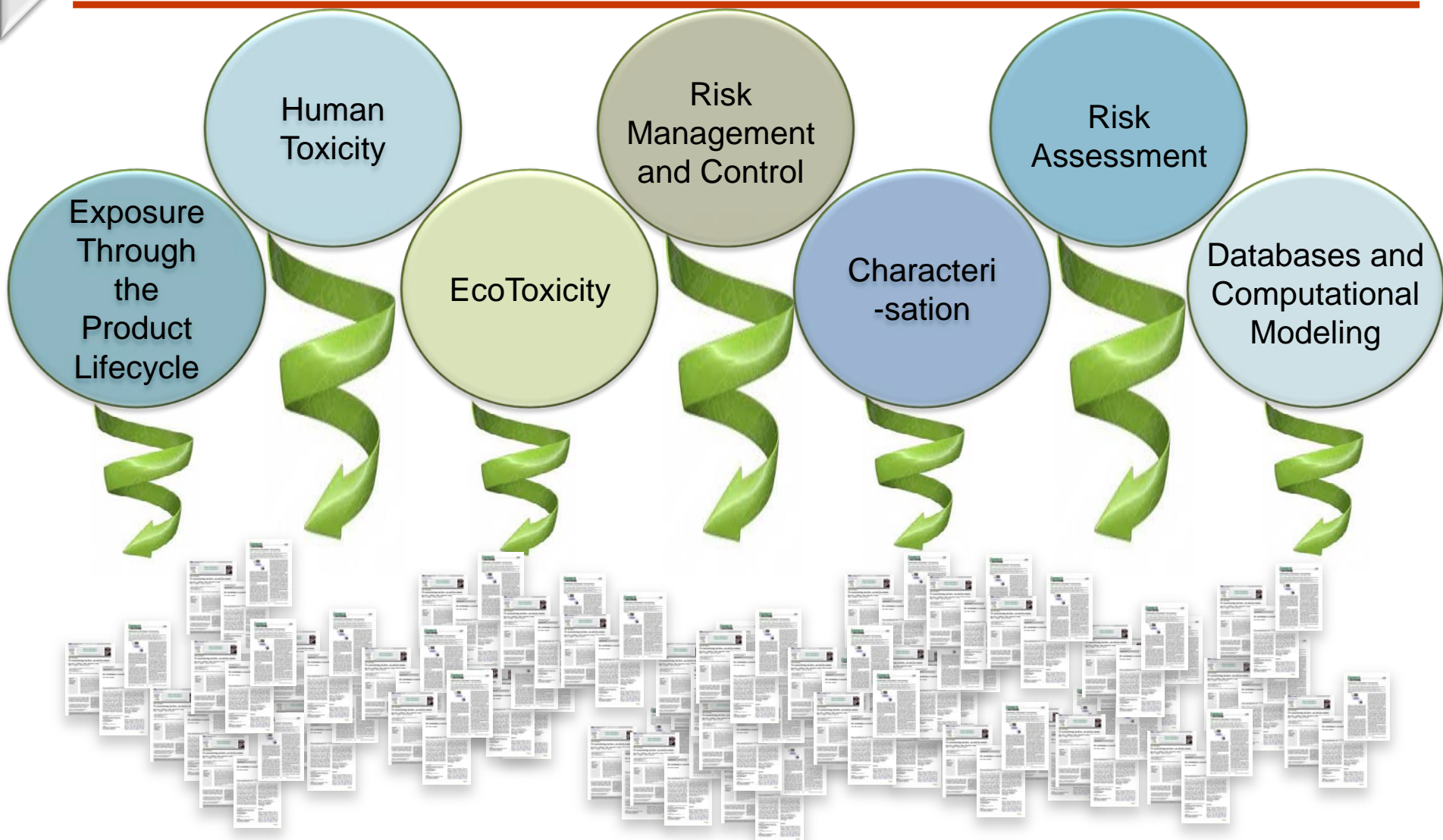
- To extract from the mental habits of traditional meetings and disciplines, spark creativity
- Cross-COR interactions
 - To facilitate knowledge synthesis
 - To navigate boundaries of knowledge and communication

Reactivity at particle and cell surfaces

Adsorption kinetics

Partitioning at compartmental interfaces

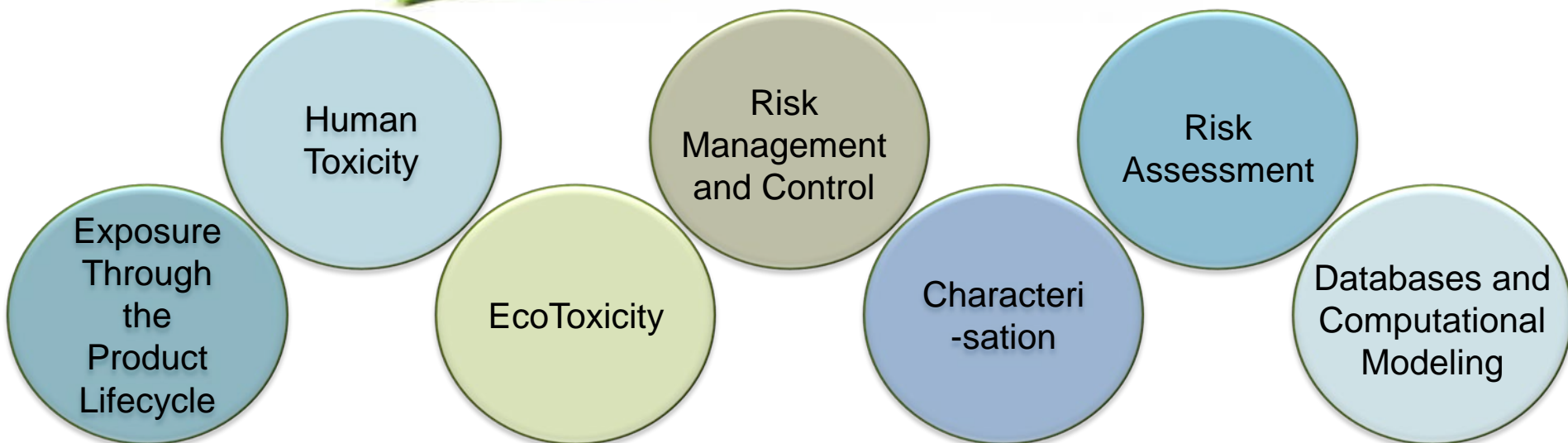
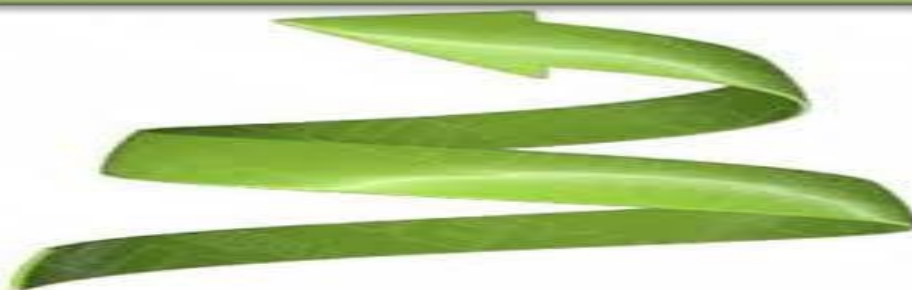
Reductionist Approaches in Individual Disciplines



Systems Level Linkages Helpful for Next Steps

Systems Level View of NanoEHS Research

- *Implications of past findings on future decisions*
- *Application of insight to future research design*

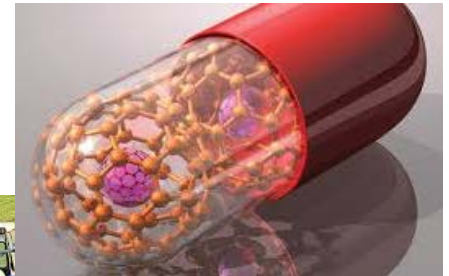
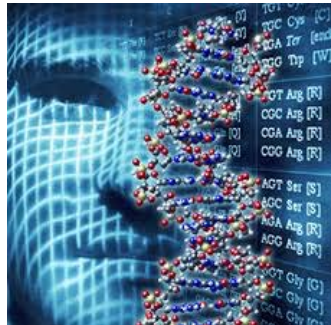


Next Gen NanoEHS Community Impacts

Risk Guidance, Sustainability and Responsible Innovation

Systems Level View of NanoEHS Research

- *Implications of past findings on future decisions*
- *Application of insight to future research design*



NanoEHS is uniquely equipped to address some issues beyond the original scope of the community's targeted findings.

- e.g. Embrace of system complexity, transformations, stochastic processes, uncertainty, critical role of kinetics

Game Play

- 12 preassigned teams (2 for each of 6 CORs)
 - Note: the DB & CM COR is divided among the other teams
- One set of 6 COR teams tackles Scenario A
- One set of 6 COR teams tackles Scenario B

Scenario A: nanoAg pesticide spill in bay	Scenario B: nanoCu Pesticide spill on road
Exposure A	Exposure B
Human Health A	Human Health B
Ecotoxicity A	Ecotoxicity B
Risk Assessment A	Risk Assessment B
Risk Management A	Risk Management B
Characterization A	Characterization B

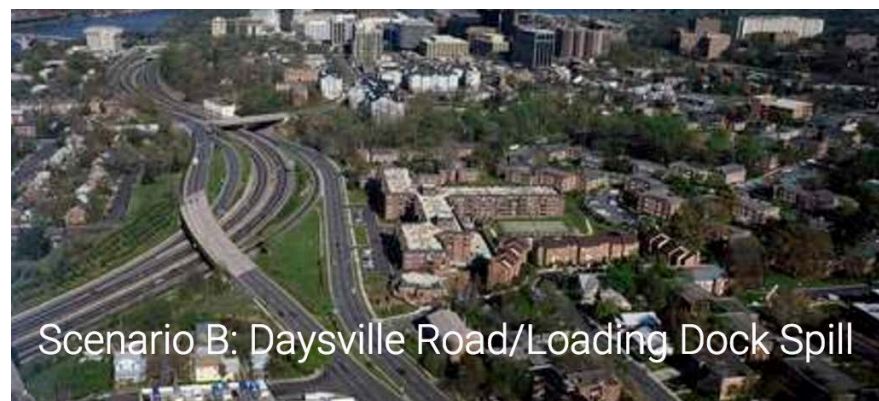
Hypothetical “Daysville” Spill Scenarios

- Mock spills of hypothetical nanoenabled pesticides
- Described in detail with mock product MSDS sheets in tool



Spill of hypothetical Nano-[Ag]-cide® pesticide product on the banks of the Days River

The hypothetical pesticide product Nano-[Ag]-cide®, has been released in the Days River through an accidental spill of a large shipment of an aqueous suspension of the nanoform pesticide. We have 4 hours to prepare for a mock press conference. Members of the press, NGOs, and concerned citizens will arrive for a mock public briefing, where they will expect our subject matter expert teams to communicate key concerns, information needs, and nano-specific considerations, and to have the opportunity to ask the nanoEHS community targeted questions about their concerns.



Spill of hypothetical Nano-[Cu]-cide® pesticide near a loading dock in Daysville

A significant quantity of copper-based hypothetical pesticide product, Nano-[Cu]-cide®, has been released in powdered form near a loading dock onto an urban street. We have 4 hours before a confidential briefing will be held before representatives of the pesticide company, regulators, and city officials (for this, assume any role relevant from a US or EU perspective). Individuals being briefed will expect our subject matter expert teams to communicate key concerns, information needs, and nano-specific considerations, and to have the opportunity to ask the nanoEHS community targeted questions about their concerns.

Charges, Goals, Outcomes

The charge

- Draft a 5-minute briefing response to the scenario
- Prepare to answer mock questions
- Record the topics of discussion utilizing an ITS-Nano hexagon framework

The goal

- Transcend disciplinary and institutional boundaries
- Draw on resources and other experts
- Link relevant information together
- Advise non-scientist stakeholders about what nanoEHS research can tell us about nanomaterials in the real world.

The outcomes

- A manuscript
- Direction for future COR activities
- Reflections on NanoEHS research strategy

Speed Consulting Process

- Other CORs will be consulted in a round-robin discussion with 10 minutes per rotation
 - ☞ 10 minutes on Scenario A
 - ☞ 10 minutes on Scenario B
- B teams will stay at the same table throughout the activity
- A teams will rotate every 20 minutes

1

2016 nanoEHS Scrimmage: Teams compete to anticipate and respond to questions about a hypothetical scenario

Two sets of COR teams prepare to deliver a 5 minute response and field questions, rotating through brief meetings with the other CORs to inform their approaches.

*** The Databases & Computational Modeling COR members will be distributed throughout the other COR teams to share their broadly enabling expertise*

NanoAg Pesticide Spill CORs

Characterization

Exposure

Human Tox

Ecotox

Risk Assessment

Risk Management

NanoCu Pesticide Spill CORs

Characterization

Exposure

Human Tox

Ecotox

Risk Assessment

Risk Management

3

Two sets of stakeholder representatives pose questions for the mock press conference (nanoAg) and mock private briefing (nanoCu). Stakeholders and the COR teams involved with the other scenario will judge the best approach to a given scenario.

Press Conference Questioners

- Media
- NGO
- Public citizens

Company Briefing Questioners

- Company reps
- City officials
- Affected Employees

Parallel Reflective Inquiry Informed by Anthropology, Philosophy & Social Science

Scrimmage Observation

Participatory observation will be used to elicit diverse stakeholders' interests, pragmatic concerns in decision making, and study underlying assumptions, conditions and values in their communication through ethnography.

2 Post-Scrimmage Survey

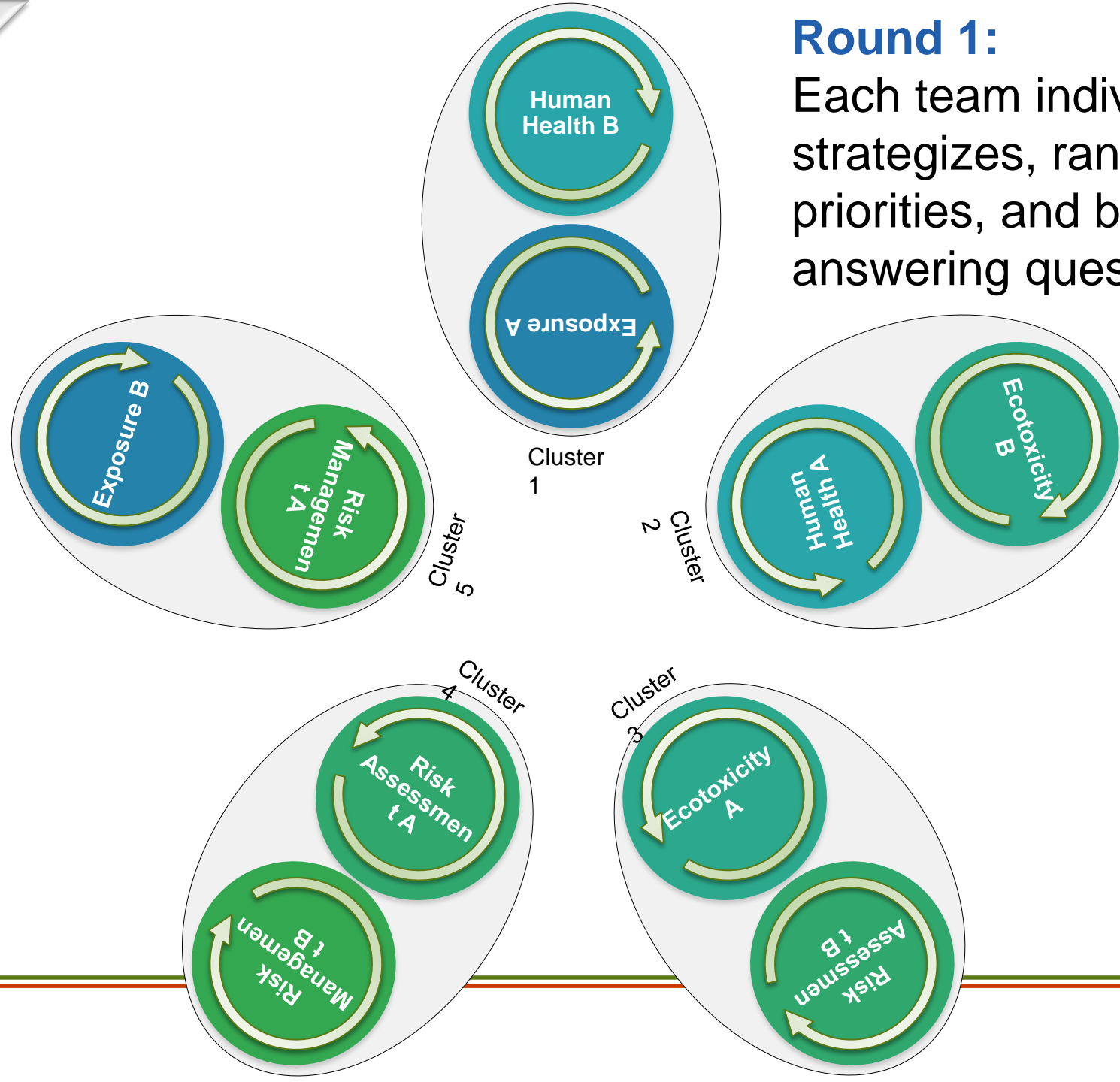
All participants enter demographic data and respond to a number of simple prompts regarding their perspectives on a variety of nanoEHS topics related to the scrimmage.

4 Discussion and Reflection

Time for participants to sit back, relax, and hear a variety of reflections on the events of the day with perspectives from anthropology, philosophy and social science.

Round 1:

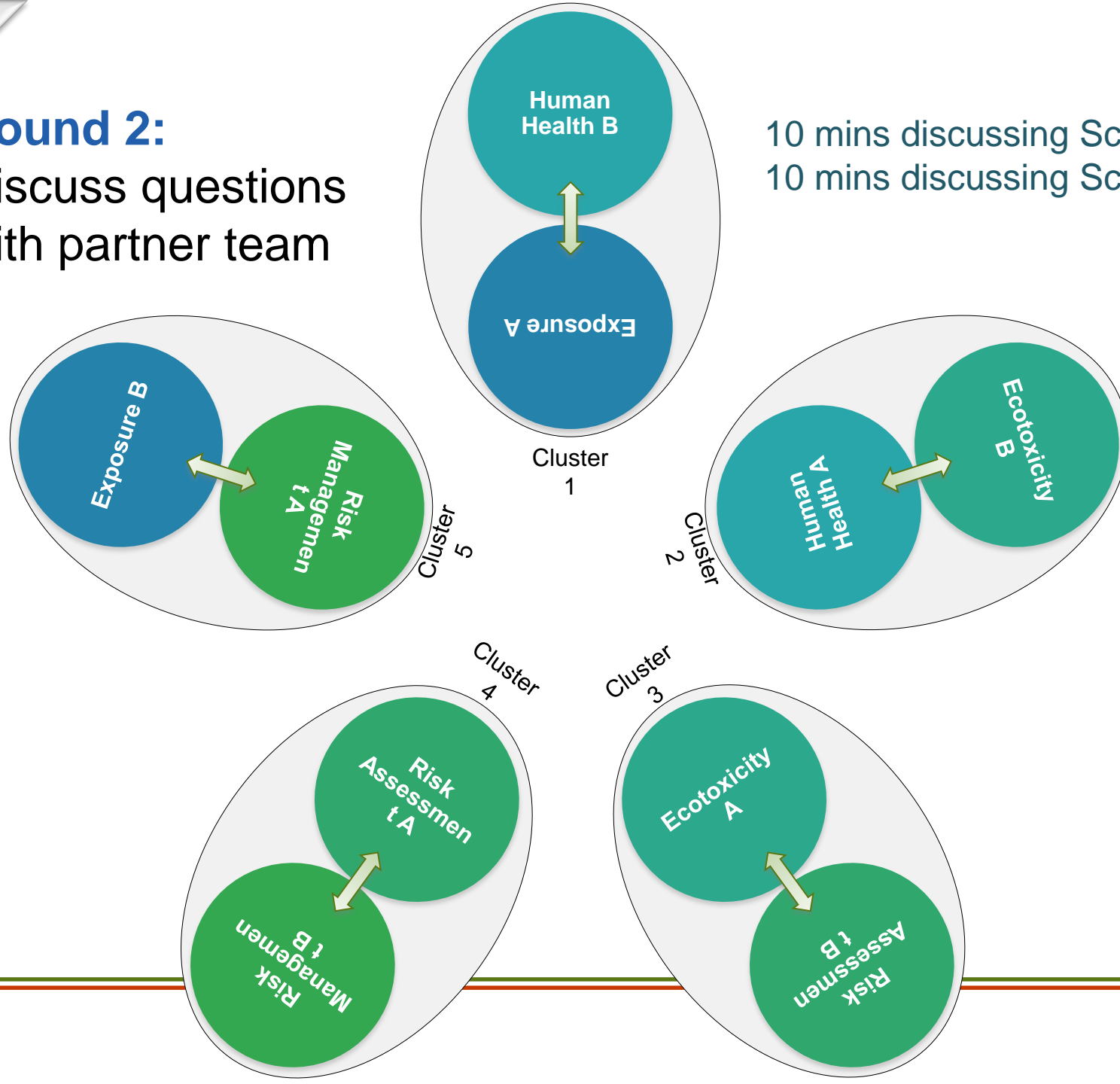
Each team individually strategizes, ranks priorities, and begins answering questions



Round 2:

Discuss questions
with partner team

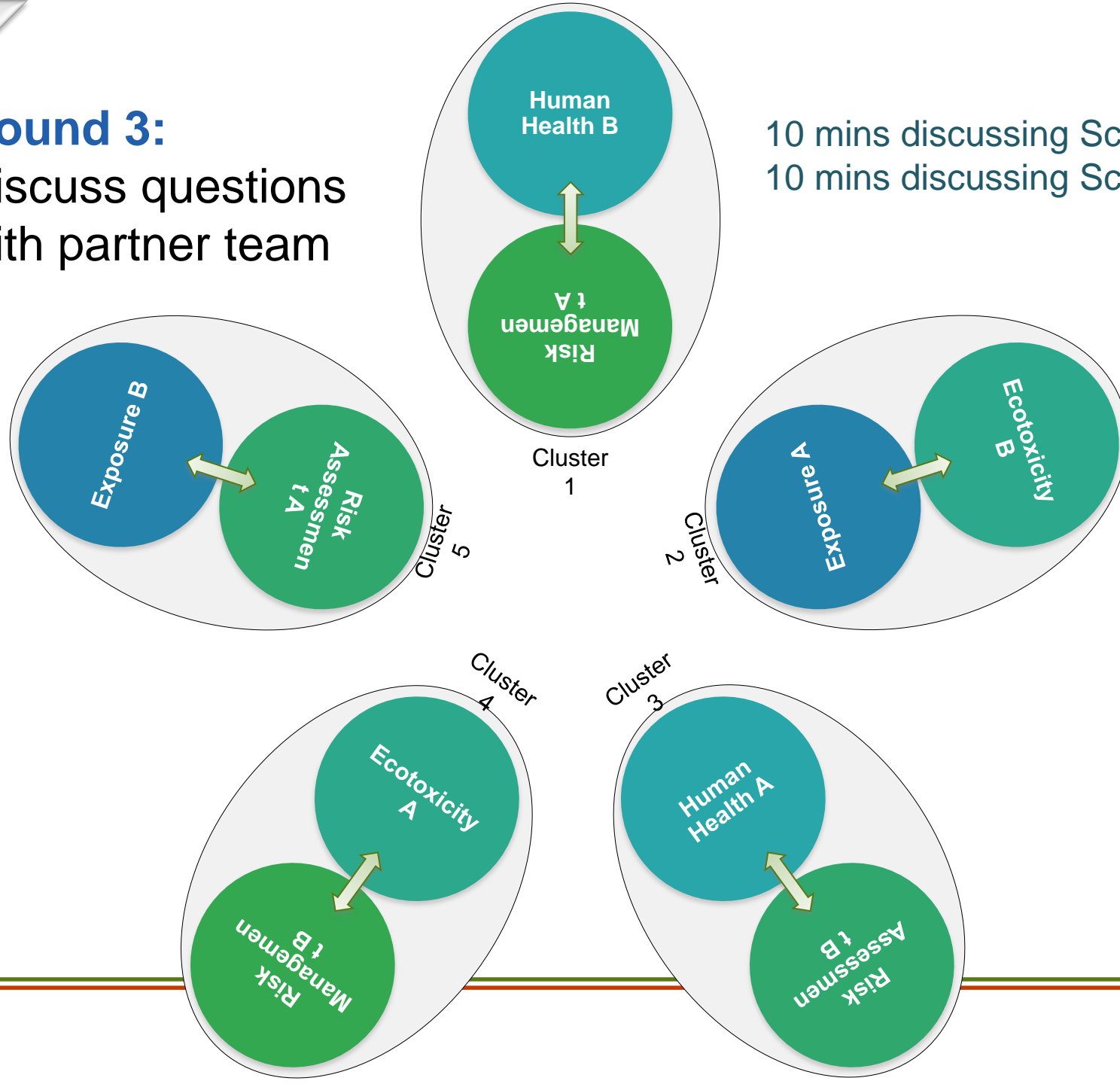
10 mins discussing Scenario A
10 mins discussing Scenario B



Round 3:

Discuss questions
with partner team

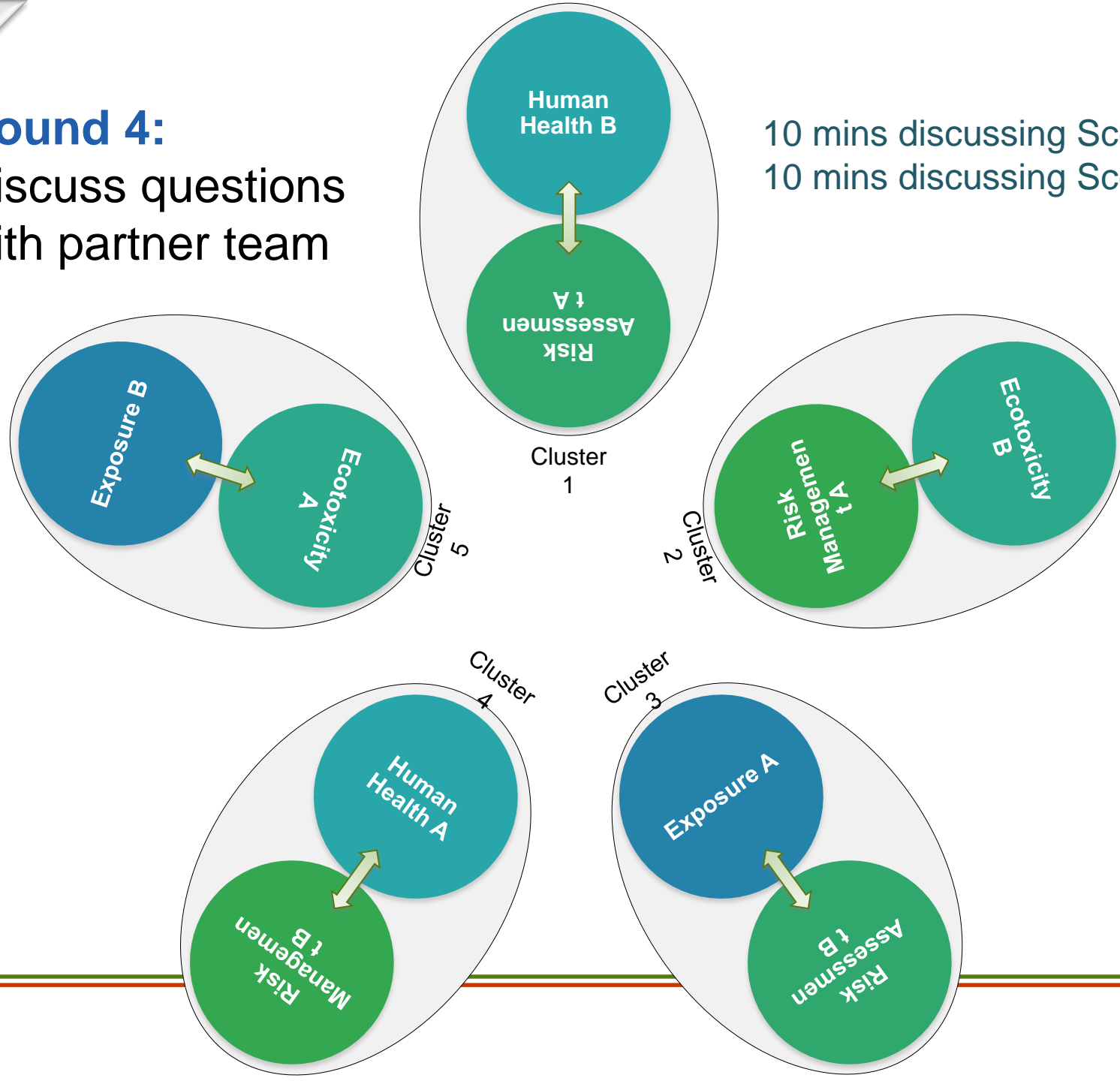
10 mins discussing Scenario A
10 mins discussing Scenario B



Round 4:

Discuss questions
with partner team

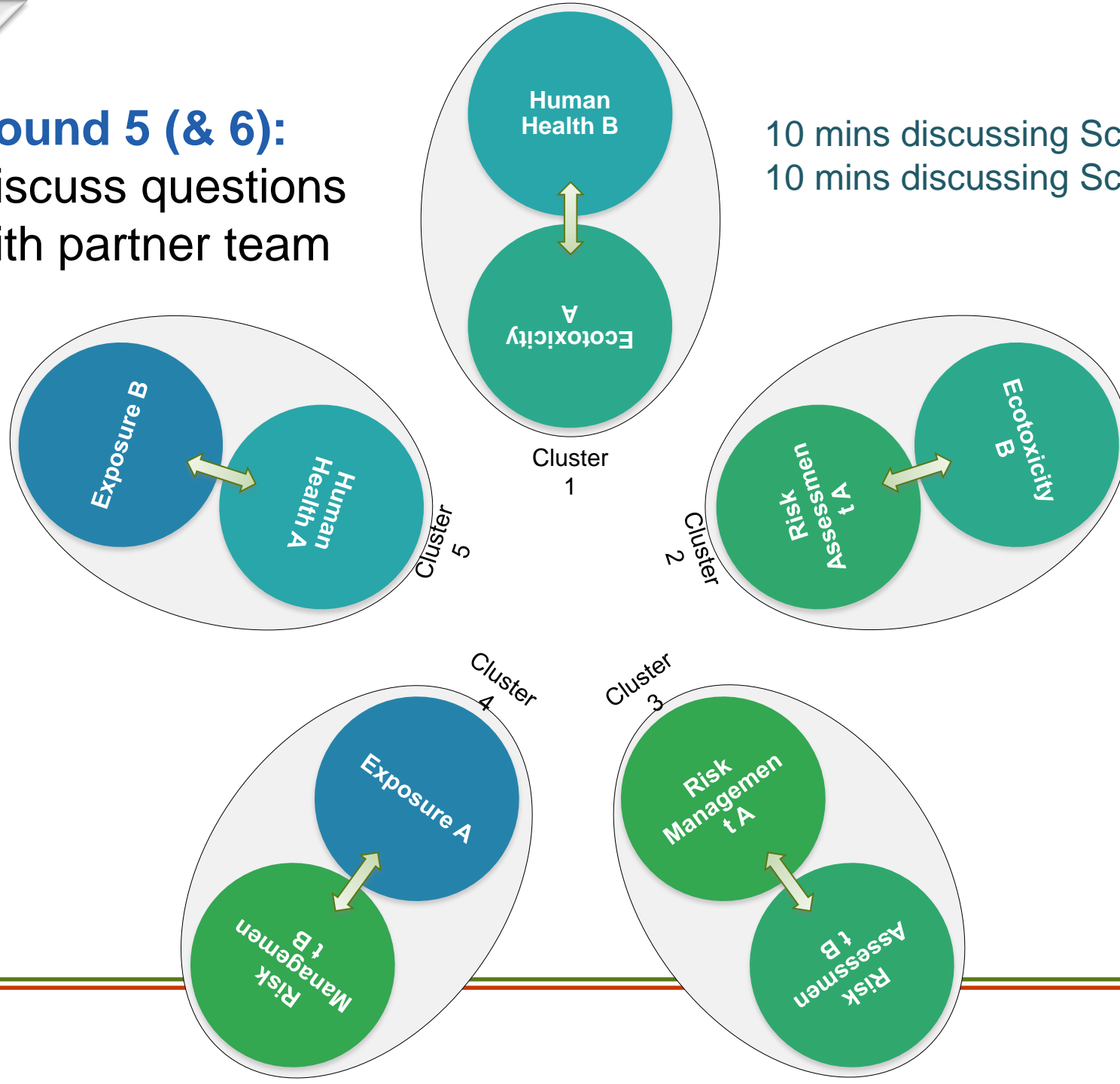
10 mins discussing Scenario A
10 mins discussing Scenario B



Round 5 (& 6):

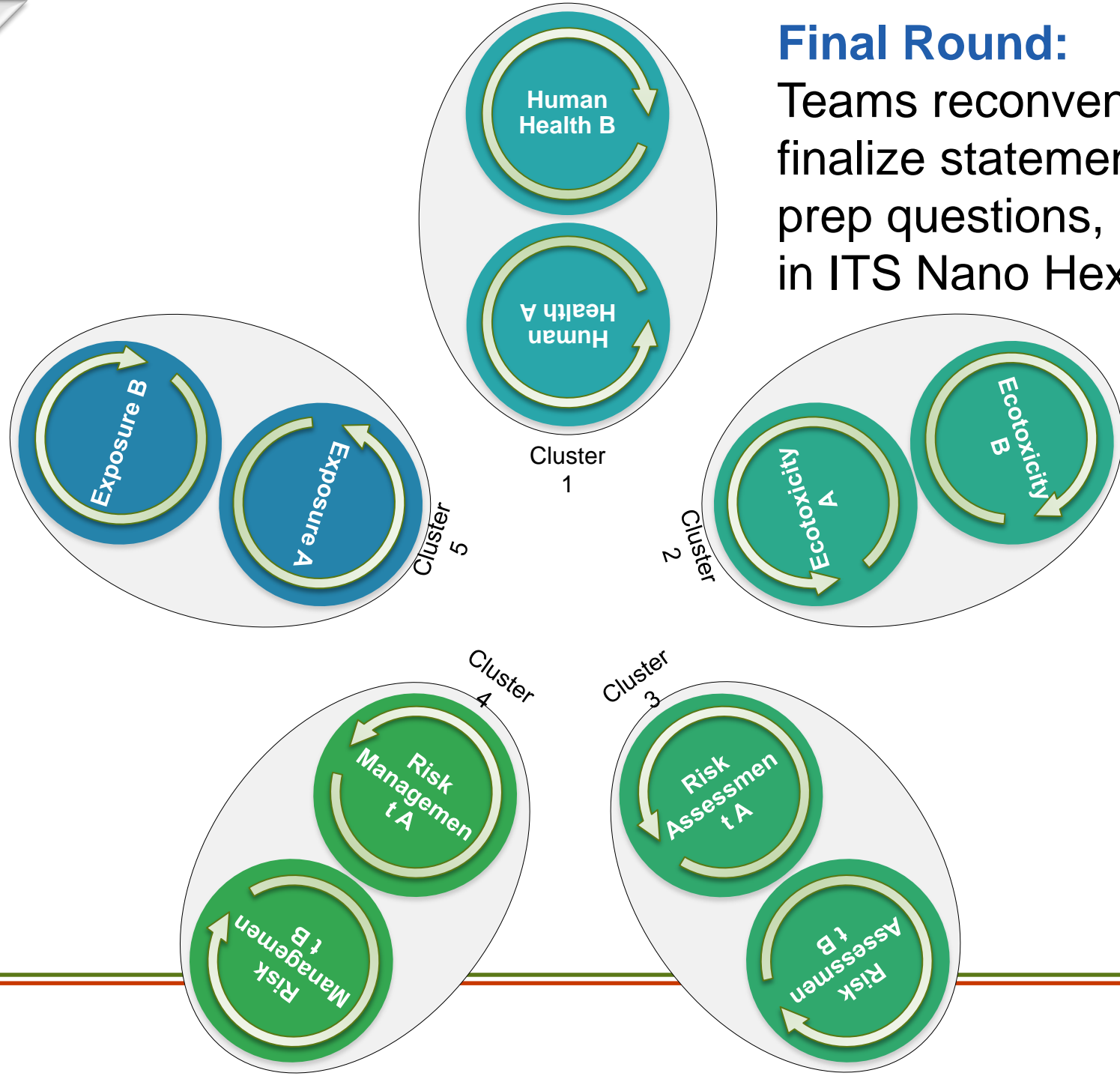
Discuss questions
with partner team

10 mins discussing Scenario A
10 mins discussing Scenario B



Final Round:

Teams reconvene to finalize statements, prep questions, and fill in ITS Nano Hexagons



Scrimmage Web Tool

- Utilize Scenario Description Details
- Utilize the Mock MSDS
- Many resources added, searchable by COR and type
- If you have questions OR would like to add something to the resources in real-time, reach out to **Lucial Farcas**



Output Goals

To carry out a **simulated decision process** exploring how **communication processes between CORs function**, and may sometimes fail, to address the information and actions needed to support responsible development of nanotechnology.

To **incorporate input from multiple communities** of expertise across the nanoEHS field.

To **provide insight into how the U.S.-E.U. CORs should advance and set goals.**

ITS Nano Hexagon Maps

Each team is responsible for marking an ITS Nano Hexagon Map indicating which of the hexagons are implicated in reaching the prepared statement.

Note:

- ◎ ITS Nano was created for identifying research needs.
- ◎ The planning committee felt it serves as a good way of aligning peoples' thoughts, and includes many areas of information that may be relevant across NanoEHS.
- ◎ Please regard ITS Nano in this context as intended – a directional guide ensuring that we are all in line and **that the scrimmage can generate a concrete outcome.**

Mock Briefings

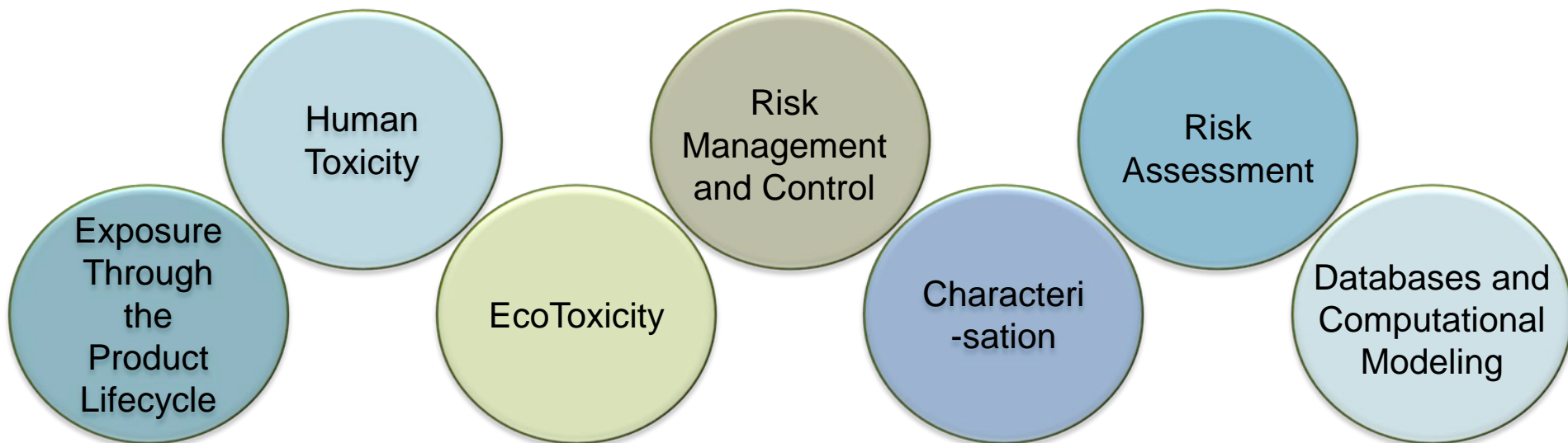
Scenario A will prepare for a press conference.

Scenario B will prepare for a company briefing.

1. Each team has 1 person deliver a 5-minute oral presentation summarizing their assessment of key issues, any concerns, and recommendations for necessary information to enable conclusions.
2. Each team will send 2 people to sit on a panel. The panel will receive a few questions from a variety of represented stakeholder groups. Responses will be moderated across the panel.

Parallel Inquiry

Reflections on the scrimmage informed by social science, anthropology, and philosophy.





Parallel Inquiry

Reflections on the scrimmage informed by social science, anthropology, and philosophy.





Parallel Inquiry

Sharon Ku, Ph.D.

- Assistant Research Professor in the Department of History, Drexel University
- Active US-EU COR member

Barbara Herr Harthorn, Ph.D.

- Professor of Anthropology, UC Santa Barbara
- Director, NSF Center for Nanotechnology in Society
- Group leader, NSF/EPA UC Center for Environmental Implications of Nanotechnology

Stephen Crowley, Ph.D.

Professor of Philosophy Boise State University, representing the ToolBox team lead by **Michael O'Rourke**, Professor of Philosophy at Michigan State University. Thanks to Dr. Stephanie Vasko and Dr. Brian Robinson.



Questions?