Databases & Ontology CoR report

3-Dec-2013

US-EU bridging nanoEHS research efforts Workshop December, 2-3, 2013 – Arlington (VA) CoR Databases and Ontologies Breakout Session

Agenda – short presentations

- Nanotechnology Knowledge Infrastructure Signature Initiative
  Mark Hoover, U.S. National Institute for Occupational Safety and Health
- NECID database on Nano Exposure and Contextual Information
  Carsten Möhlmann, Inst. for Occupational Safety and Health of the German Social Accident Insurance
- NanoRegistry
  Alex Tropsha, U North Carolina Chapel Hill
- (i) eNanoMapper; (ii) EU Nanosafetycluster WG4
  Egon Willighagen, Maastricht University

Top questions for databases and ontology

1. What should you do if someone calls in you in the middle of the night about a nanomaterial spill? What are the appropriate safety measures? Should we evacuate? Can we drink the water?
2. What can we do ahead of time to provide quick answers?
3. How do the potential scenarios for nano-safety differ among the application areas (nanomedicine, occupational/industrial, emergency response, environmental) when there are different standards for each area?
4. What does a risk assessor need to know?

What does a risk assessor need to know?

- Has this happened before? How was it managed?
  - Case study databases
- Do we have toxicological reference values for the relevant materials?
  - Reference databases
    - E.g., NANOREG, etc. – reference data of toxicity
- What is the nature and extent of contamination?
  - Concentration in different media/substrates?
  - Releasibility and movement?
- Who will be exposed and how much will they be exposed to?
- What is the fate/transport/accumulation of particles?
  - Changes based on location/context of spill, etc.
- What are the health effects?
- Do we need a workflow for accident management/triage?

Existing resources

- There are several existing resources for both nanotechnology and risk assessment...
- ...but inventorying them is an ongoing challenge.
- We need your input!
  - Databases & Ontology CoR
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Database & Ontology Gaps

- Need new ways to provide pathways to relevant information – risk assessor may not know where to look for nanomaterials, etc.
- Risk assessment marketplace (a federated data/methods portal – not necessarily commercial):
  - How do we populate risk assessment paradigm with relevant information about nanomaterials, etc.?
  - Establishing data quality objectives for different risk questions: influences sampling/measurement strategy
  - Supply
    - Exposure methods developer
    - Biological effects data producers
  - Demand
    - Risk assessor
    - Exposure methods developer – what methods need to be developed?
  - What are the units? Different contexts/applications have different needs
    - E.g., how to translate from lab to workplace?

Database & Ontology Gaps

- Integration with other databases: provide situational awareness for responders
- Curation workflow
- Matching the right measurement method with the right sample/particle/etc.
  - Role of standard methods
    - Limits of applicability; strengths/weaknesses
- Ontology to bridge different areas of risk assessment
  - Language differences across disciplines/areas
  - What about language localization?
- Under what circumstances do people want to (have to) share data?
- Educational gaps?

Specific starting points

- Added value for existing risk/exposure data resources
- Exposure scenarios
  - Spill
  - Modification of existing case studies
    - Leverage existing emergency incident information
      - How can these be modified in the case of nanomaterials?
      - Simple questions; e.g., classification of spill as liquid or particulate to understand which leakage model is most appropriate?
    - Will the presence of nanomaterials augment/change the emergency scenario?
- What is the specific pilot project? Do we need a project to coordinate pilots?

Ongoing issues

- What are best practices for licensing and sharing of data?
  - "Blind dating" for data sharing
  - clear copyright/license provenance
  - require open deposition on publishing (like pdb.org)
- How do we engage other organizations in data-sharing standards issues?
  - E.g., OECD's role in data exchange, sharing
    - Example: chemicals program
    - How do we get them involved?
      - Endpoint identification (with other CoRs)
      - Develop harmonized template based on endpoints
      - Comparison/mapping to ISA-TAB-Nano

A very preliminary list of risk assessment resources

- Major Accident Report Scenario (MARS)
- UN Fast Environ Assessment Tools
- EPA IRIS
- EPA CLUE-IN?
- DoT Emergency Response Handbook
- IUCLID (but not generally accessible for all data)
- To be continued…