

A Risk Analyst's Perspective on Research Needs for Risk Analysis of Nanotechnology

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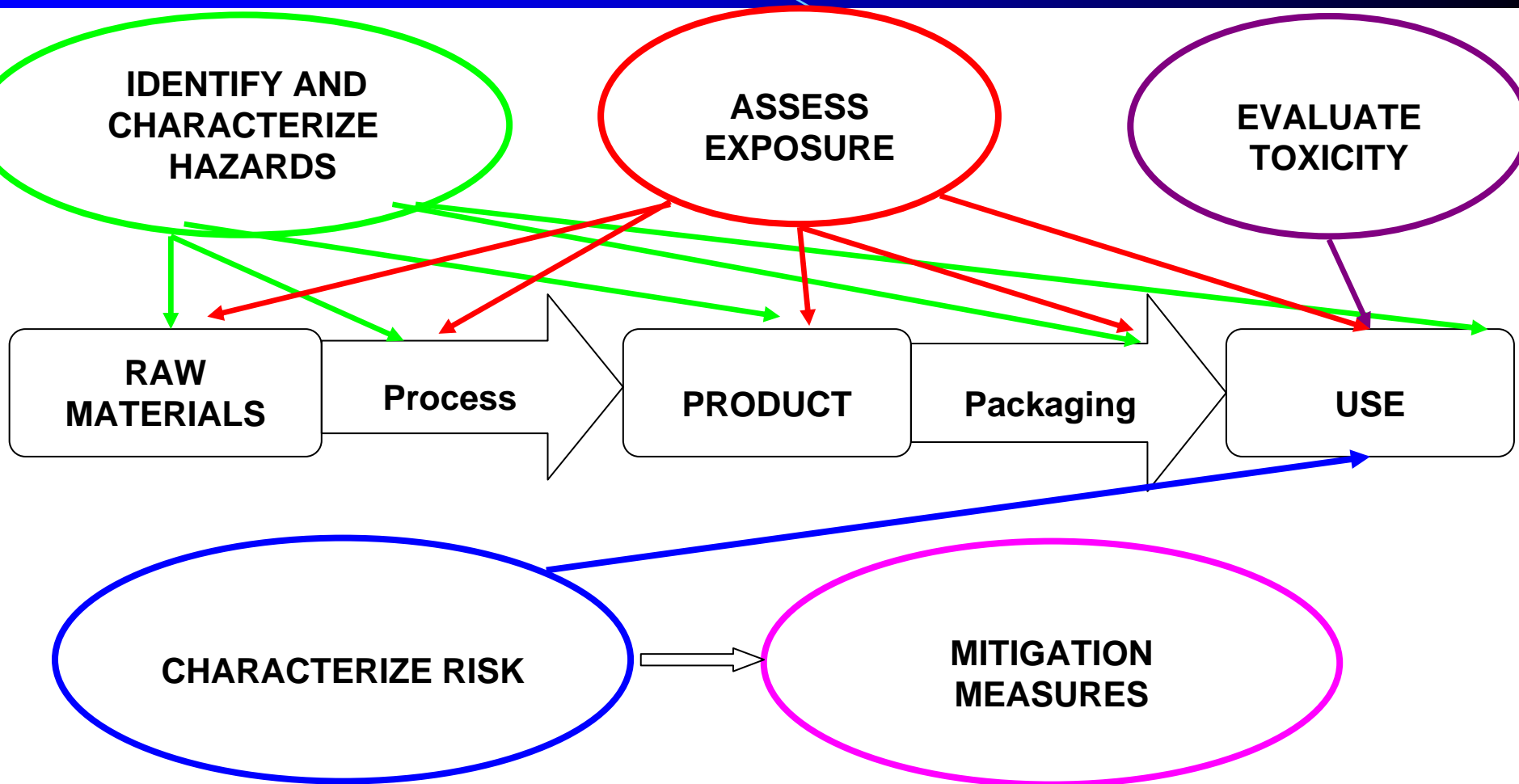
Overview

- I. **Use screening level risk assessment to prioritize risk research for nanotechnology and nanoscale materials**
- II. **There is need for research into risk analysis for nanoscale materials**
- III. **There is a need to address issues regarding incorporating life cycle assessment in a risk analysis framework generally, and specifically for nanoscale materials.**

I. Prioritizing Risk Research

- Use risk-informed approaches to formulate the problem in question
 - Identify the scope of the analysis early
 - What are the questions that need to be addressed?
- Adopt screening level/ adaptive risk assessment approaches for prioritizing nanotechnology and nanoscale material research
 - Consider the life cycle of material
 - Identify key uncertainties

Cadmus' Adaptive Screening Risk Assessment Framework for NM



II. Risk Analysis For Nanoscale Materials Requires Research

- Important to align data (research) with the analytical framework (s) for nanoscale materials and nanotechnologies
- Address what is “nano” about risk assessment for nanoscale materials
- Risk analysis toolbox offers numerous options for making risk management decisions under uncertainty
 - Many tools to conduct screening level analyses and make decisions in an adaptive framework
 - Which approaches are adequate or appropriate

III. Life Cycle Approaches to Risk Assessment and Risk Management

- A significant advance to consider product life cycle for nanoscale materials, but not a clear path
- How to implement these approaches – not part of the current risk management paradigm
- Recently discussed at Society for Risk Analysis
 - How the problem is framed affects the results
 - Products versus ingredients

Incorporating “Life Cycle” Thinking in a Risk Analysis Context

- A variety of frameworks exist/proposed
- There is a need to address life cycle/risk issues generally, and specifically for nanoscale materials
 - E.g. when in the life cycle of a nanomaterial is there potential for exposure to nanoscale particles?
 - Life cycle impacts versus risks across the life cycle

In Summary

- EHS research can be prioritized using risk informed screening approaches.
- Many tools in the risk analysis toolbox can inform directions for EHS research.
- Research is needed on the process for risk analysis for nanomaterials. Interdisciplinary research is needed to inform what is “nano” about risk assessment for nanomaterials.
- We need to conduct research into how to address the life cycle of materials in risk analysis, and how our risk management frameworks will use this.