

Agenda – CoR 2 Ecotox...

Rapporteur : Jacques-Aurélien Sergent (EU)

13-13.40: Presentations

- Henriette Selck – CoR vision
- Steve Klaine (H Selck) (US)
- Annemette Palmqvist (EU)
- Alex Orlov (US)

13.40-14.40: Discussion

14.40-15.00: Summary & Conclusions

15.00: Coffee

15.30-16.00: Finalizing workshop report (ppt)

16.00: Present workshop report (20 min + 10 min Qs)

CoR Vision:

Ecotoxicology,
Environmental Chemistry,
Material Characterization,
and Predictive models

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Ecotoxicology

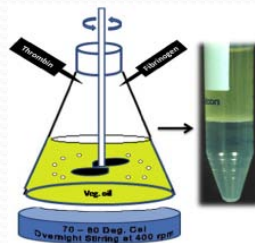
Test with water exposure are increasing rapidly but focus primarily on acute toxicity and less on chronic effects, bioavailability, and bioaccumulation.

Tests with soil/sediment/diet are scarce.

Current aquatic, sediment, and soil bioassay methodology require modifications to work optimally with nanomaterials.

Standardized test protocols – need to reach consensus on:

- How to apply NMs (water, media, sed/soil, diet)?
- How and when to report Nanomaterial characterization
 - Size, shape, surface chemistry, aggregation state, ????
 - Surface area, particle number, mass or all 3
 - Before experimental start, during exposure, ..
- What are the most sensitive receptors?
- Appropriate endpoints (mortality, growth, reproduction, subcellular)?



Are we working with the correct materials?

- Fresh NM versus aged NM

Status:

- How engineered NMs behave and how they interact with biota is poorly understood

Need:

- Validated bioassays, hazard assessment tools and predictive models to be developed and tested for NMs
- Fundamental research: to assess consequences of interactions of NMs with biota governing:
 - bioavailability,
 - bioaccumulation,
 - internal deposition, and
 - deleterious effects.

Environmental chemistry & Characterization

We are able to characterize NMs in water/media in lab
but need consensus on which data to present in papers
Big knowledge gap in how to analyze NMs in
sediment/soil/(diet):



Q' s on Environmental concentrations and fate

- Where do NMs enter environmental media, at what rate and concentration?
- Where can we expect (highest) exposure and at what levels and form, including interactions with other (bio)substances?
- How do we detect engineered nanoparticles among the many 'natural' particles?
- Effect of coating for NM fate?

Need:

- understand the influence of NM characteristics on processes incl: environmental fate, bioavailability, bioaccumulation, internal deposition, and effects.
- standardize testing methods for NMs!

Require:

- Methods to characterize NMs: every stage of exposure (incl. complex media), uptake, distribution, and accumulation
 - ⇒ determine exact bioavailable/bioaccumulated dose & correlate quantified response with measured dose
 - ⇒ together with ecotox data, allow us to perform sound RAs and to set environmental quality standards for NMs.



Predictive models

While ecotoxicity data and health effects data are still scarce, important trends are emerging on the overall shorter term ecotoxicity of NMs.

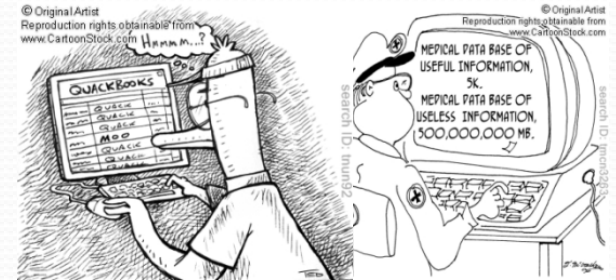
We approach a stage where the necessary information to develop predictive models exists

What is needed

- Good databases!
 - Experimental projects being able to report data in accessible format
 - Modelling projects finding appropriate information

Essential to strengthen communication between those doing regulatory testing, modelling, and fundamental experimental research to create the basis for optimal use of experimental data

- E.g., NanoReTox & ModNanoTox (e.g., bioaccumulation-, QSAR-, Exposure concentration-, population- and RA models)



CoR Scope

- To engage the scientific communities in Europe and the US currently conducting environmental research on nanomaterials,
- To connect similar efforts, and
- To encourage the evolution of
 - hazard assessment methods and
 - predictive models built on the foundations of fundamental research characterizing fate of nanomaterials in different environmental compartments and the interactions of nanomaterials with biota and ecosystems.



Objectives of the session



Based on discussion of the '10 nano-related questions':

- Assess current research status (experiences, tools, ways of addressing recurring questions and challenges)

Incl: research not yet published / things that do not work

- Develop list of sub-topics/research needs to serve as focal point of future discussions
- Refine CoR scope (if necessary)



Actions: first steps toward building momentum (including timeline)

- Finalize Steering committee
- How to involve and activate scientists from EU and US in CoR work
- Plan for moving ahead (e.g., sub-topics / research needs)
- Knowledge transfer among sub-groups
- Meetings: frequency & form(s)

