



3<sup>rd</sup> US-EU nanoEHS workshop: Arlington, VA, 2013

## Community of Research – CoR on Predictive Modeling for Human Health

EU Co-Chair:

Prof. Bengt Fadeel, MD, PhD, ATS

Institute of Environmental Medicine

Karolinska Institutet, Stockholm, Sweden

US Co-Chair:

Prof. Jim Riviere, DVM, PhD, DSc(hon), ATS

College of Veterinary Medicine, Department of Anatomy  
and Physiology, Kansas State University, Manhattan, KS

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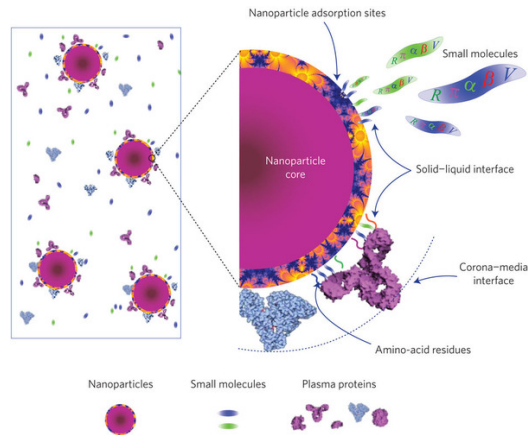
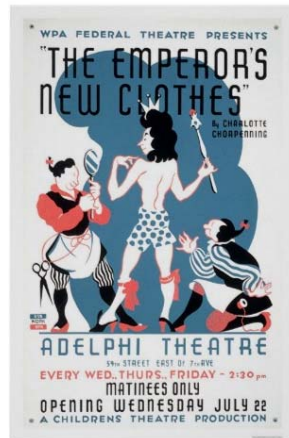
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“With thousands of new materials emerging, as well as thousands of variants of these materials, there is an urgent need for agreed concepts of how to **predict likely impacts on human health** based on relationships between physico-chemical properties, properties of nanomaterials in situ under relevant exposure conditions [cf. bio-corona], and for identification of connections between those properties with impacts from studies done on previous materials...”

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## Emperor's new clothes in reverse: nanoparticles are not "naked" but coated in a corona of biomolecules



[Xia XR, Monteiro-Riviere NA, Riviere JE, Nat Nanotechnol. 2010;5(9):671-5]

## How to define nanomaterials for regulatory purposes? Focus on the 'biological identity'

- “Nanomaterials should be considered as *biological entities*, and studied [and regulated] as such.”  
[Nanosafety in Europe 2015-2025: Towards Safe and Sustainable Nanomaterials and Nanotechnology Innovations. 2013].





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## Objectives

Focus on different aspects of predictive modeling for human health including:

in silico modeling including nanoQSARs, systems biology approaches/computational biology and global omics methodologies; and animal models to understand/predict human health effects of engineered nanomaterials, eg. carbon-based

Discuss and refine CoR scope and aims, plan future activities, modes of action (for instance, webinars, other suggestions)

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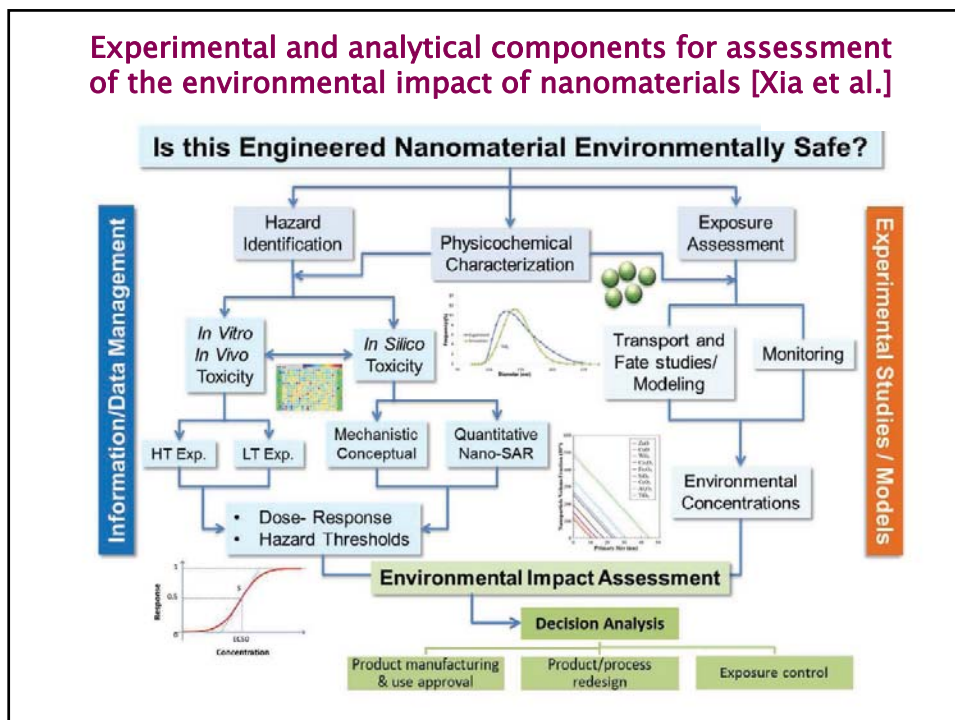
## 2012 workshop:

- The Helsinki session focused on quantitative structure-activity relationship (QSAR) modelling to understand and predict toxicological effects of engineered nanomaterials
- Speakers: Dr. Yoram Cohen, USA; Dr. Enrico Burello, The Netherlands
- Co-Chairs: Bengt Fadeel, Sweden; Yoram Cohen, USA
- Rapporteur: Dr. Lang Tran, UK
- Joint TC with Human Health + Databases and Ontologies CoRs

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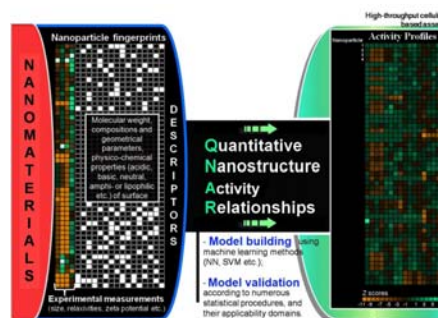
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**Experimental and analytical components for assessment of the environmental impact of nanomaterials [Xia et al.]**

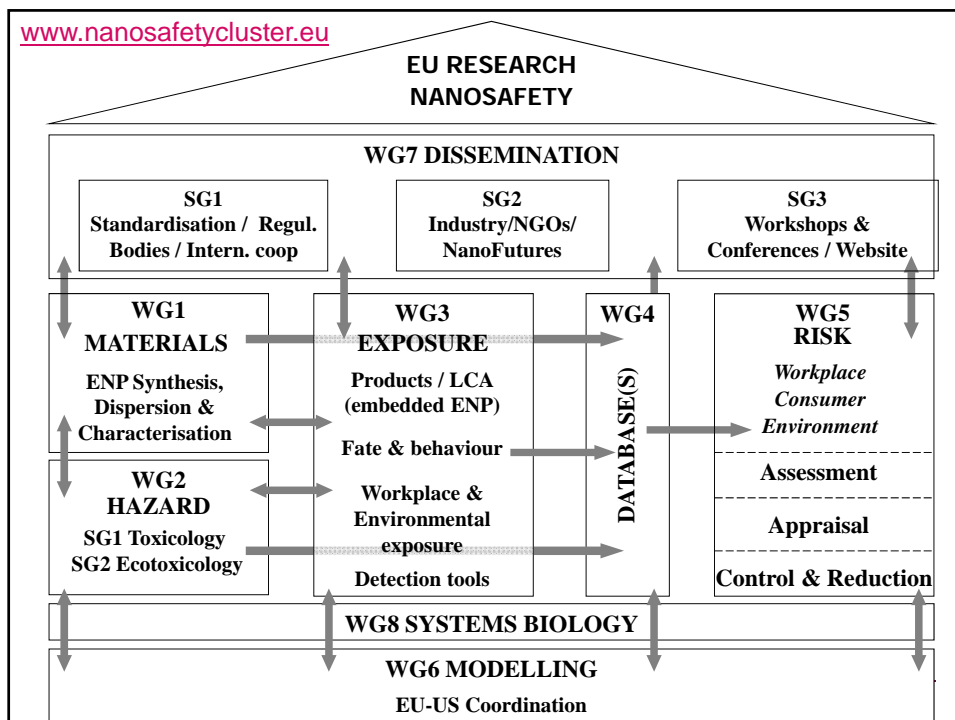


[www.modena-cost.eu](http://www.modena-cost.eu)

**MODENA (modeling nanomaterial toxicity): COST action on Quantitative Nanostructure-Toxicity Relationships (QNTRs) [COST Action Chair: Lang Tran, IOM]**



[Fouches et al. ACS-NANO. 2010 Oct 26;4(10):5703-12]



**7<sup>th</sup> INTERNATIONAL CONGRESS  
NANOTOXICOLOGY**

**.nanoTOX2014**

**April 23 - 26, Antalya**

<b>ABSTRACT SUBMISSION</b>	JANUARY 31, 2014
<b>EARLYBIRD REGISTRATION</b>	JANUARY 31, 2014

[www.nanotox2014.org](http://www.nanotox2014.org)

7<sup>th</sup> INTERNATIONAL NANOTOXICOLOGY CONGRESS  
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Dosimetry In Vitro- In Vivo	Exposure & Life Cycle Assessment	Computational Toxicology
Genotoxicity & Cancer	Pulmonary Toxicity	Neurotoxicity & Blood-Brain Barrier
Eco-Toxicology of Nanomaterials	Systems Biology Approaches	Nanoparticles & Biological Barriers
Recent Breakthroughs in NanoBiotechnology	The Bio-Corona Concept	Nanomedicine: From Bench to Clinic

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*bridging nanoEHS research efforts*

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**Agenda**

- Introduction: Bengt Fadeel, Sweden
- Invited Lecture 1: Robert Rallo, Spain
- Invited Lecture 2: Francesco Falciani, UK
- Invited Lecture 3: Brian Thrall, United States
- Invited Lecture 4: Anna Shvedova, United States

General Discussion, all CoR members: scope, aim, future plans

[www.us-eu.org](http://www.us-eu.org)