bridging nanoEHS research efforts

3rd 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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"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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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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Objectives

Highlight 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. CNTs

Discuss and refine CoR scope and aims, and plan future activities

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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

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Robert Rallo

Structure-activity relationships for nanomaterials: joint US-EU research on predictive nanotoxicology

Universitat Rovira i Virgili

MODern Modeling Nanotoxicity

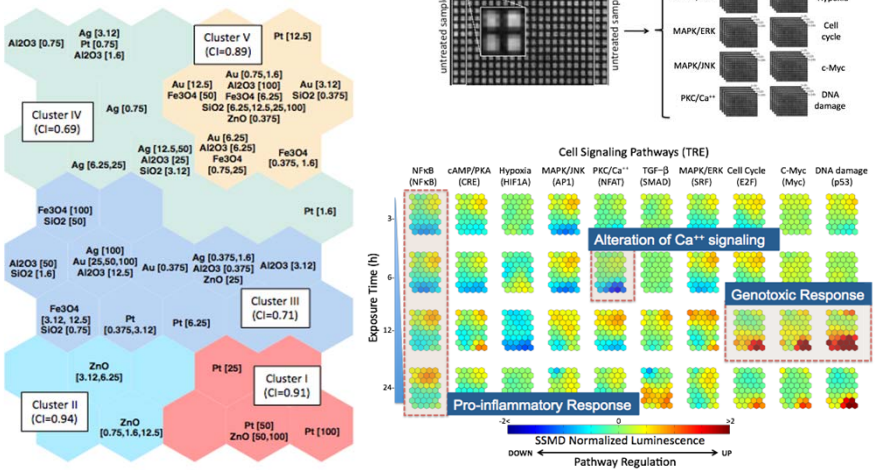
UCLA

University of California UC CEIN Center for Environmental Implications of Nanotechnology

ENVIRONMENTAL Science & Technology
ARTICLE
pubs.acs.org/est

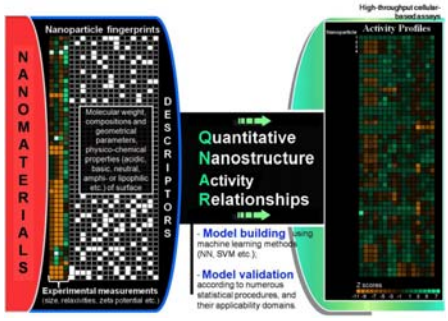
Self-Organizing Map Analysis of Toxicity-Related Cell Signaling Pathways for Metal and Metal Oxide Nanoparticles

Robert Rallo,[†,‡] Bryan France,[†] Rong Liu,[†] Sumitra Nair,[†] Saji George,[†,§] Robert Damoiseaux,[∥] Francesc Giralt,[⊥,#] Andre Nel,[†,§] Kenneth Bradley,[∇] and Yoram Cohen*[,†]



www.modena-cost.eu

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



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

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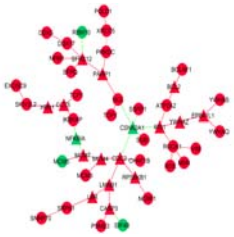
Francesco Falciani

Systems biology approaches for studying toxicity; and a proof-of-principle study of Ag NWs in Daphnia



BBSRC bioscience for the future

NATURAL ENVIRONMENT RESEARCH COUNCIL

MRC Medical Research Council CENTENARY 1913 2013

defra

CANCER RESEARCH UK

Cancer Research Technology

European Commission

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Brian Thrall

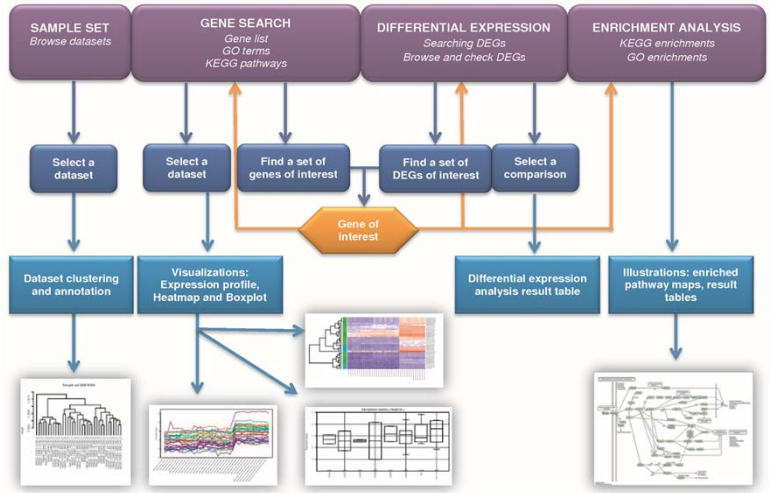
Omics approaches in nanosafety research: prediction of toxicity and susceptibility pathways

Even 'benign' nanoparticles which lack direct cytotoxic or proinflammatory effects can alter the regulation of hundreds of genes.

NIEHS

Pacific Northwest NATIONAL LABORATORY

NANOMMUNE



- NanoMinerDB (http://nanominer.cs.tut.fi) contains 404 human transcriptome samples exposed to various types of nanoparticles [Kong et al. PLoS One 2013; 8(7): e68414].

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Anna Shvedova

Effects of nanomaterials on human health: animal models; focus on carbonaceous nanomaterials vs. asbestos, bio-diesel vs. diesel

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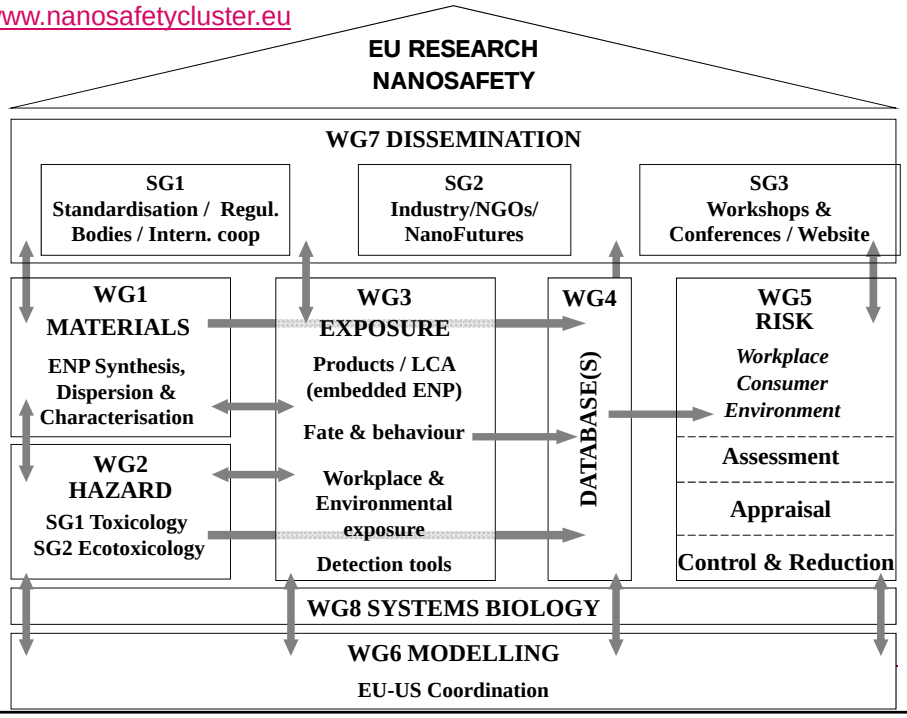
General discussion:

- Need to define principles for predictive toxicology of nanomaterials; important to move away from 'uncertainty'
- Data sharing (but need to agree on format for data collection; cf. eNanoMapper project, modeling projects in FP7)
- Joint US-EU research - FP7, Horizon 2020, COST action MODENA; continue webinars (eg. bio-corona, UCD team)
- Exposure should be considered in modeling – link to other CORs

www.us-eu.org

www.nanosafetycluster.eu



7. INTERNATIONAL NANOTOXICOLOGY CONGRESS

nanoTOX2014

April 23 - 26, Antalya

ABSTRACT SUBMISSION	JANUARY 31, 2014
EARLYBIRD REGISTRATION	JANUARY 31, 2014

www.nanotox2014.org

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BIOCENIT Research Lab, Universitat Rovira i Virgili, Catalunya
UC Center for Environmental Implications of Nanotechnology - CEIN

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