

NanoSafe Australia: Mission, Members & Activities

A/Prof. Paul Wright

NanoSafe Australia www.rmit.edu.au/nanosafe

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NanoSafe Australia



Nationwide network of toxicologists and risk assessors

Mission:

- To support government, industry and non-government organisations (NGOs) in their efforts to understand the occupational and environmental health and safety issues surrounding nanotechnology products and their manufacturing processes
- To provide quality data for the appropriate risk assessment of nanoparticles (NP) and nanomaterials (NM)

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NanoSafe Australia Expertise

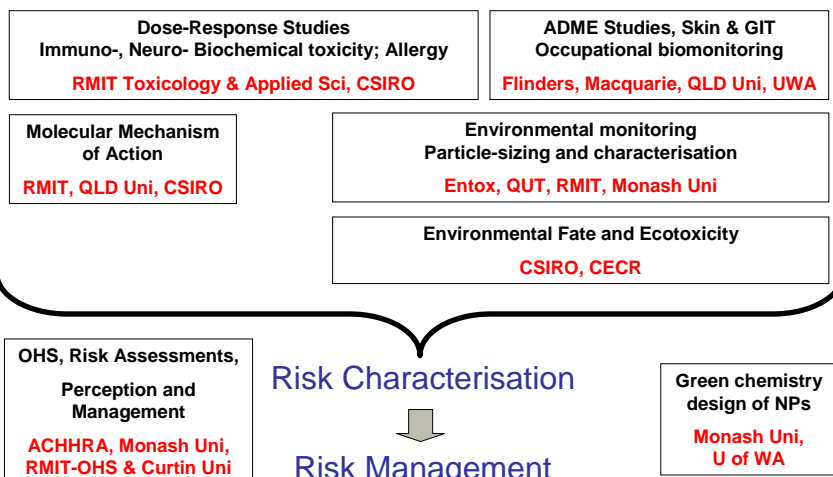


- In fields directly related to nanotoxicology:

- Characterisation of physico-chemical properties
- Measurement of ultra-fine particles in ambient air
- Toxicokinetics of particles
- Pre-clinical safety testing
- Immuno-, neuro- & biochemical toxicology
- Occupational & food allergy
- Occupational hygiene, OHS & workplace monitoring
- Ecotoxicology & environmental toxicology
- Ecological & human health risk assessments

NanoSafe Australia – Informing RAs

Hazard I.D., Dose-Response & Exposure Assessment



NanoSafe Australia Participants

RMIT University

CI1: A/Prof. Paul Wright (RMIT Toxicology)

- Occupational & environmental immuno- & biochemical toxicology

Roles: Co-ordinator of NSA; researching immunotoxicity of NP;
GLP toxicity testing (via RMIT Drug Discovery Technologies, RDDT)

Co-Investigators:

A/Prof. Terry Piva (RMIT Med Sci)

- UV toxicity specialist investigating metal oxide NP in sunblocks

A/Prof. Andreas Lopata (RMIT Appl Sci)

- Occupational allergist investigating allergic potential of NP & NM

Dr Bryce Feltis (RMIT Med Sci) · Immunotoxicology of NM

Dr Andrew Harford (RMIT associate) · Environmental immunotox of NM

Dr Neale Jackson (RMIT Appl Sci, OHS)

- OHS specialist conducting lab & field site OHS/EHS inspections

Dr Garry Bryant (RMIT Appl Sci, Physics)

- Soft condensed matter specialist & dynamic light scattering of NP

PhD Students: Andrew Hastings, Sean O'Keefe & 3 CRC students

- using *in vitro* test systems to screen for immuno- & dermal toxicities

NSA Participants

Flinders University

CI2: A/Prof. John Edwards (Dept of Enviro. Health)

- Occupational toxicology & industrial hygiene

Roles: researching *in vitro* TK models for skin & G.I. NP absorption;
occupational biomonitoring surveillance for genotoxicity

Co-Investigators: Nico Volker (biotechnology)
Steve Thomas (occupational safety)

Monash University

CI3: Prof. Brian Priestly (ACHHRA, Director)

- Expert in human health risk assessment

Roles: NanoVic liaison; provision of meaningful RA of NT processes;
practical risk management strategies & effective risk communication

PhD Student: Margaret Stebbing

- Investigating community risk perceptions of nanotechnologies

CI4: Prof. Terry Turney (Centre for Green Chemistry)

- Expert in NP & NM design, synthesis & development

Roles: CRC Adv Mfg project leader; nanotech industry liaison

NSA Participants

University QLD / QUT

CI5: Prof. Michael R. Moore (EnTox, Director)

· Enviro. toxicology, incl. health effects of ultrafine particles; HHRA

Roles: laboratory and field particle-sizing capacity

Co-Investigator:

Prof. Lidia Morawska (Intl Lab for Air Quality & Health, ILAQH, QUT)

· Wind tunnel measurements; analytical characterisation of particulate materials; GLP *in vitro* testing

CI6: Prof. Michael Roberts (UQ)

· Skin penetrance studies (human vs. pig/rodent)

Macquarie University

CI7: Prof. Brian Gulson (Isotopes in Hlth & Enviro. Res Grp, Director)

· Impact of metals on environment health

Roles: using stable isotopes as tracers for NP; human dermal PK/TK studies with NT industry (jointly with CSIRO Nanosafety Theme)

Co-Investigator: Dr Phil Casey (CSIRO) **PhD Student:** Herbert Wong

NSA Participants

CSIRO

CI8: Dr Rob Fitzpatrick (Centre for Enviro. Contaminants Res.)

· CECR: Enviro. chemistry (water & soils), trace analysis, ecotoxicology, speciation & bioavailability

Team Roles: research into enviro. nanovectors (uptake pathways, bioavailability & toxicity of manufactured NM & their potential as nanovectors for environmental contaminants)

Co-Investigators:

Dr Graeme Batley (Co-Director CECR, enviro. chemist)

Prof. Mike McLaughlin (Co-Director CECR, enviro. chemist)

Dr Simon Apte (enviro. chemist)

Dr Nicola Rogers (enviro. microbiology & bacterial ecotoxicology)

Dr Natasha Franklin (enviro. toxicologist)

Dr Mark Smith (enviro. chemist)

CI9: Dr Maxine McCall (Div Molecular Health Technologies)

· Leader of Nanosafety Theme in Future Manufacturing Flagship

Co-Investigators:

Dr Megan Osmond, Dr Hong Yin & Dr Yalchin Oytam (*in vitro/vivo* test systems for cytotoxicity & differential gene expression by DNA chips)

CI10: Dr Jurg Schutz (Div Materials Science & Engineering)

· Evaluating measuring devices for CNT workplace monitoring

NSA Participants

University WA

CI11: Prof. Colin Raston (Centre Strategic Nano-Fabrication, Director)

· Green chemistry design of nanomaterials

Co-Investigator: Dr Mohamed Makha

CI12: A/Prof. Lee-Yong Lim

· Drug delivery systems incorporating NT; research using *in vitro/vivo* models to evaluate dermal, intestinal & hepatic toxicity of biomed NM

Co-Investigator: Prof. George Yeoh (Liver parenchymal & stem cell)

PhD students: Wendy Jing-Wen Loh; Clint Johnson

Curtin University

CI13: Prof. Jeffery Spickett (School of Public Health)

· Public health, environmental health & impact assessment, OHS

Co-Investigator: Dr Krassi Rumchev

NSA National collaborations

- ARC Nanotechnology Network (ARCNN)
 - NSA is the OHS arm of ARCNN, developing OHS inspection processes for Australian NT facilities
- NHMRC Advisory Committee on Health & Nanotechnology (ACHN)
 - NSA members: Chairperson – Priestly (ACHHRA), Wright (RMIT), Rogers (CSIRO)
- Standards Australia NT-001 (ISO TC229)
 - WG 3 Health, Safety & Environmental Aspects of Nanotechnology
- Safe Work Australia (DEEWR-ASCC)
 - NSA members undertaking projects in NT OHS program
- CSIRO Future Manufacturing Flagship – Nanosafety Theme
 - Strong emphasis on nanosafety in NT activities

NSA International collaborations

Current

- Pacific Northwest National Laboratories (PNNL), Richland, WA, USA
 - *In silico* dose-response modelling

Developing

- Rice University, Houston, TX, USA
 - Center for Biological & Environmental Nanotechnology (CBEN)
 - International Council on Nanotechnology (ICON)
- U.S. Air Force Research Lab (AFRL)
- Safety of nanomaterials Interdisciplinary Research Centre (SnIRC), UK
- Regional: Japan, Malaysia, Singapore, Taiwan & China



NanoSafe Australia - Publications



1st & 2nd Newsletters @ www.rmit.edu.au/nanosafe

OHS Position Paper:

Harford, Edwards, Priestly, Wright "Current OHS best practices for the Australian nanotechnology industry." *J OHS ANZ* (2007) 23(4):315-31

Book Chapter:

Priestly, Harford "The Human Health Risk Assessment (HHRA) of NMs". *In: New Global Frontiers in Regulation : The Age of Nanotechnology*. (Ed Hodge, Bowman, Ludlow). Cheltenham: Edward Elgar, UK. 2008 ISBN 9781847205186.

Commentary:

Priestly, Harford & Sim "Nanotechnology: A promising new technology - but how safe?" *Med J Aust* (2007) 186(4): 187-188

Safe Work Australia (DEWR-ASCC) Report:

Jackson, Lopata, Elms & Wright (2009)
"Evidence of the effectiveness of workplace controls to prevent exposure to engineered NMs"

