Abstract Submission for IPTC 2016 in Singapore

11th International Particle Toxicology Conference, organised jointly by IOM Singapore, A*STAR-IBN, and NTU.

The call for abstracts remains open **until 5 June 2016**, **midnight Singapore time**.

Authors

Author 1

Name
Bryony Ross

Affiliation number(s)
1

Early Stage Researcher?
No

Author 2

Name
Eva Malone

Affiliation number(s)
2

Early Stage Researcher?
No

Author 3

Name
Mick Rae

Affiliation number(s)
2

Early Stage Researcher?
No

Author 4

Name
Hans Bouwmeester

Affiliation number(s)
3

Early Stage Researcher?
No

Author 5

Name
Ilse Gosens

Affiliation number(s)

Affiliations

Affiliation 1

Institution/City/Country
Institute of Occupational Medicine, UK

Affiliation 2

Institution/City/Country
Edinburgh Napier University, UK

Affiliation 3

Institution/City/Country
RIKILT Wageningen UR, NL

Affiliation 4

Institution/City/Country
RIVM, NL

4

Early Stage Researcher?
No

Author 6

Name
Flemming Cassee

Affiliation number(s)
4

Early Stage Researcher?
No

Author 7

Name
Erin Werner

Affiliation number(s)
2

Early Stage Researcher?
Yes

Author 8

Name
Malgorzata Ślązak

Affiliation number(s)
2

Early Stage Researcher?
Yes

Author 9

Name
Gary Hutchison

Affiliation number(s)
2

Early Stage Researcher?
No

Contact Address

Name
Miss Bryony Louise Ross

Email
bryony.ross@iom-world.org

Institution
Institute of Occupational Medicine

Address

Research Avenue North, Riccarton, Edinburgh, Lothian EH14 4AP, United Kingdom

Abstract

Title
Development of in vitro strategies to predict in vivo toxicity of Engineered Nanoparticles to the Male Reproductive System

Character Count
122

Abstract
The introduction of engineered nanomaterials (ENM) to new materials and products requires informed risk assessment. The altered physico-chemical properties of ENM mean traditional assays to evaluate toxicity must be modified or validated to ensure they are fit for purpose. Reproductive hazard testing is associated with high animal burdens and monetary costs. Thus, in line with the 3Rs principle for Reduction, Refinement and Replacement of animals in testing, alternative (non-animal) testing strategies are attractive options.

To explore whether in vitro testicular cell line studies could be indicative of findings in vivo, we exposed both cell lines and rats to a panel of highly relevant standardised ENM: copper oxide, two types of silver, silica and relevant ionic controls (provided by FP7 projects MARINA & SUN). To provide an indication of toxicity in vitro, the murine testicular steroidogenic Leydig cell line TM3 was exposed to ENM for 24 hours across a range of doses, and analysed using the WST-1 & Alamar Blue cytotoxicity assays to provide toxicity data inclusive of exposure time and dose factors.

In vitro outcomes were then compared to those of rats which had been treated in vivo either via traditional 28 day oral gavage (silver, silica) or an alternative 5 day short-term inhalation protocol (copper oxide). This was achieved by histological examination of testicular tissue, which included sterological analysis and quantitative evaluation of changes observed.

To date, results in vitro have proved indicative of adverse effects elicited by silver ENM exposure in vivo. Initial examination of copper oxide and silica also show a correlation between findings in vitro and in vivo. The results are being used to validate findings in vitro, and to guide intelligent testing strategy development for ENM-specific reproductive toxicity.

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1863

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74

Type(s) of particles
Engineered nanoparticles

Type(s) of toxicological research
in vitro
in vivo animal

Session topic(s)
Particles and the developing body (tissue repair, regeneration, foetal development...)
Risk assessment and management methodologies (focus on role of toxicology)