ABSTRACT BOOK

May 15th · 18th, 2023
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EEMGS & SEMA

2023

51st European Environmental Mutagenesis and Genomics Society **(EEMGS)** & 27th Spanish Environmental Mutagenesis and Genomics Society **(SEMA)** meeting.

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eemgs EUROPEAN ENVIRONMENTAL MUTAGENESIS & GENOMICS SOCIETY

sema Sociedad Española de Mutagénesis y Genómica Ambiental

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PROGRAMME

03. NAMs SESSION
Tuesday 16th May: 9:00 - 11:00

Chairs: Guillermo Repetto (Universidad Pablo de Olavide de Sevilla, SPAIN)
Isabel Gaivão (Universidade de Trás-os-Montes e Alto Douro, PORTUGAL)

09:00 – 09:45
3Rs: from complexity to predictivity
Francesca Caloni (University of Milan) ITALY
Invited speaker

09:45 – 10:00
The human HepaRG cell line: a brief history of its use in genetic toxicology: advantages, limits and future directions
Ludovic Le Hégarat (French Agency for Food, Environmental and Occupational Health & Safety - Fougeres Laboratory, Toxicology of Contaminants Unit) FRANCE

10:00 – 10:15
***In vitro* cell transforming capacity of different types of nano-plastics**
Julia Catalán (Finnish Institute of Occupational Health) FINLAND

10:15 – 10:30
In silico modelling of crosstalk between DNA damage and oxidative stress for prediction of cellular adversity
Elsje Burgers (Division of Drug Discovery and Safety, Leiden Academic Centre for Drug Research - Leiden University) THE NETHERLANDS

10:30 – 10:45
Perspectives for DNA adductomics in large-scale exposomics: upscaling sample preparation and preprocessing data
Lieselot Hemeryck (Laboratory of Integrative Metabolomics, Ghent University) BELGIUM

10:45 – 11:00
Oxidative Stress Disrupt Differentiation of Human Induced Pluripotent Stem Cells
Ann-Karin Olsen (Norwegian Institute of Public Health, Division of Climate and Environmental Health) NORWAY

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3Rs: from complexity to predictivity

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The application of the 3Rs principle, Reduce, Refine, Replace (Directive 2010/63 EU), asks for scientific innovation with a continuous development of methodologies. Non Animal Methods (NAMs), from cell cultures to tissue-based assays, from in vitro epithelial barriers for oral, respiratory and topical exposure (i.e. alveolar, dermal, intestinal barrier) to 3D cultures and organoids and/or spheroids, are useful predictive tools, in order to answer to the requirements of biological complexity. Moreover it is clear that the new approach is looking to a strategy, integrated or tiered, through combined tests, instead of stand alone methods, that are a few and with limited application, like in skin irritation (OECD 439) or corrosion (OECD 431).

Considering systemic toxicity like carcinogenicity, genotoxicity, reproductive toxicity or the multiple mechanisms of Endocrine Distuptor Chemicals (EDCs), new alternative methods are necessary to solve complex endpoints.

If the new vision implies Integrated Testing Strategies (ITS), Integrated Approaches for Testing and Assessment (IATA) or Defined Approaches for Testing and Assessment (DA), on the other hand research is looking to advanced technologies like Microfluidic Perfusion Systems (MPS), which could expand their applicability from toxicity testing to biomedical research.

A predictive 3Rs interdisciplinary approach, addressed to investigate different aspects of a multilevel science, considering humans, animals and environment through a One health vision, is the future goal.

Keywords:
3Rs; Non Animal Methods; Predictivity; Complexity.