ECETOC Workshop:
Applying ‘Omics Technologies in Chemicals Risk Assessment

Welcome

- Background and Context
- Goal for the next 3 days
- What happens after the workshop?

Alan Poole, ECETOC Secretary General
Background and Context

After several decades of research into ‘omics technologies:

Is there *still* a need for robust, transparent frameworks for collecting, analysing & applying ‘omics data?

Survey to determine / refute the need for such frameworks

(ECETOC, together with T. Gant, W. Tong, U.G. Sauer)
Background and Context

**Survey: 1.** Written inquiry with chemical companies: “Do you use ‘omics for regulatory submissions?”

- Not as REACH standard information requirements: 
  Lack of standardisation, validation, regulatory acceptance
- But: ‘Oomics are being used to determine modes-of-action
- Authority acceptance? Positive in (US) crop protection sector

**Survey: 2.** Are EURL ECVAM or OECD engaged in standardising or validating methods using ‘omics?

- Only evidence identified: OECD EAGMST Sub-Team established at the initiative of Tim Gant
Survey 3: Internet and PubMed searches: Guidance available, e.g. in relevant reports or publications?

All reports and publications highlight the need to:
• Standardise collection, analysis & application of ‘omics data
• Develop robust, transparent, best practice frameworks (both for regulatory or research purposes)

Relevant parameters to be covered in frameworks identified some suggestions on how they should / should not be addressed

But:

Unable to find comprehensive guidance on either data collection, data analysis or application of ‘omics data
Data Management Ensuring Factual Correctness & Reproducibility

Experiment → Data → Gene List → Understanding

Data Generation and Storage (MAQC Consortium)

Data Processing → Data Interpretation

Framework (GLP-like) for Acquiring Data
- Data Collection
- Data Curation

Framework for Analysis/Processing
- Data collection and pre-normalisation analysis
- Normalisation
- Statistical Selection

Framework for Applying Data
- Q WoE
- Pathways to connect results of “Omic” data and phenotype

Path To Standardised Internationally accepted Best (GLP-like) Scientific Practices in an OECD Accumulated Structure

Session 1
- Day 1
- Session 4
- Day 3
- Sessions 2 & 3
day 2
Goal for next 3 days

1. Obtain feedback on the 4 draft frameworks:
   • Collecting/Curating Data:
     1. “Quality Assurance of “Omics” technologies considering GLP requirements (H-M Kauffmann)
   • Applying data in a QwoE:
     2. Framework for the weighting of evidence utilisable for hazard/risk assessment purposed: application to chemicals with either rich or limited data sets (Prof. Jim Bridges/Mark Pemberton)
     3. Framework for the weighting of evidence applied to omics data for hazard/risk assessment (Prof. Jim Bridges/Mark Pemberton)
   • Analysing data to make gene lists:
     4. Framework for the analysis of omics data for regulatory application

2. Consider research needs
What happens after the workshop?

• Workshop Report – *Ursula Sauer, science writer*

• Incorporate comments into draft frameworks

• Work with you and others to take the outcomes of this workshop to the next step – *help us decide what the next step should be*

• Publication in peer-reviewed journal (?)
ECETOC Workshop:
Applying ‘Omics Technologies in Chemicals Risk Assessment

Thank you!