Nanosafety data and tools infrastructure: A risk assessment perspective

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Over 100 million € spent on tools and data for RA of nanomaterials

- EU REACH regulation № 1907/2006 → Chemical Safety Assessment (CSA) for substances, manufactured or imported in quantities above 10 tons/ year
- The CSA follows the conventional risk assessment (RA) paradigm
- The SCA/RA paradigm is in principle applicable to engineered nanomaterials (ENM), but should be complemented by adequate tools and data
- Over 100 million € spent on developing complementary data and tools (e.g. experimental protocols, models) for RA of ENMs

Need for databases/inventories to store data and analytical tools (protocols)…

…in a structured way, so that they are easily accessible to all potential end-users

These databases/inventories should cover:

- Phys-chem properties
- Release and exposure
- Hazard
- Risk
- Risk management

Need for a common nanosafety language and IT tools to properly manage data/knowledge

We need:

- To efficiently homogenize, organize and structure the newly generated nanosafety data and knowledge by means of a common nanosafety language (i.e. shared ontology, terminology and nomenclature)

- To continuously update the data resources, which is difficult to do manually for vast data volumes, so new IT methods for automatically updating these resources are needed

Towards developing an interoperable data and knowledge infrastructure

Develop an infrastructure to support an interoperable network of data and analytical services:

- To provide a new way for scientists and risk assessors to immediately access and use data and tools, saving them from investing time in fruitless web searches and literature reviews
- To help scientists and risk assessors link data from multiple (online) sources in order to generate data sets for further scientific analysis
- To make it easier to link data sources to modelling tools

The transformation of the ongoing efforts on developing databases and tools into a dedicated nanoinformatics research infrastructure requires a profound understanding of the needs of the scientific community and the strengths and weakness of experimental results **-> a multidisciplinary approach is needed!**

Decision support infrastructure

Cluster databases and modelling tools into risk assessment and management decision support systems

Some first steps were made in SUN and GuideNano and we continue in caLIBRAte

Benefits:

- user-friendly tools, easily accessible by various stakeholders
- easier to manage the future (sustainability) of a package of tools as compared to single tools

Drawbacks:

- IPR issues
- lack of continuous funding to host and maintain such infrastructures