caLIBRAte
nano risk governance

Identification and collation of data required for performance testing

Background

For the performance testing of the risk assessment tools and models selected for the caLIBRAte Nano Risk Governance Portal, data on physico-chemical characteristics, toxicity, exposure and environmental fate of a range of nanomaterials are needed.

This factsheet describes how the required data were identified and gathered. First of all, the in- and output parameters of the selected tools were collected, as for these parameters values need to be retrieved from the existing databases.

Subsequently, data requirements considering the quality and completeness of the data have been listed.

To find suitable existing data for the performance testing, an inventory of existing 'nanosafety' databases was made. In cooperation with the NanoSafetyCluster WG on data management a survey was circulated among database owners (Feb 2017) to gather information on the contents of these databases.

Findings

- The input and output parameters of the selected tools were compiled for the human and environmental risk assessment models by interviewing the owners of the tools or via the published models or literature.

- Based on scientific literature, requirements with respect to data quality and completeness were described as minimal compulsory data entries for physico-chemical characteristic and (eco)toxicity.

- 69 databases were listed containing information on nanosafety; 26 database owners responded to the survey. These were Cerasafe, DaNA, eNanoMapper, HSE Nano, Keele University (data from several projects), NanoFate, NanoImpactNet, Nano-

MILE, NanoPUZZLES, NANoREG, Nanosolutions, Nanovalid, NECID, S2NANO, Sanowork, Scaffold, Serenade, SIRENA, SUN, TINE, UK NanoRegister, and Vieille-Nanos

- The 26 responding databases primarily contained data on physico-chemical characteristics, toxicity (*in vitro*, *in vivo* and/or eco), environmental release/fate and exposure. Other types of data mentioned were kinetics, life cycle data, omics, nanomedicine, functionality, biomonitoring and incident data. More information from the responding databases is given in Figure 1.

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Availability of the data collection for others

- The data are not currently available, but are planned be made available in future
- The data are available online or by arrangement with the owners
- The data are confidential and only available via an intranet or on a specific computer
- Other

Nature of the data in the database

- Experimental raw results data
- Aggregated data, e.g. averaged values, LC50's
- SOPs, protocols and other experimental documentation
- NANO-based product and article data and information
- NANO EHS general help, advice and guidance information

Data sources

- Original own (or project or institute) generated data
- Original third party generated data
- Data extracted from the literature
- Other

Nanomaterials for which data are included in the database

- Metal oxides
- Metals
- Carbon Nano Tubes / MWCNT / Fibres
- Other inorganic NPs
- Carbon NPs (e.g. graphene, fullerenes)
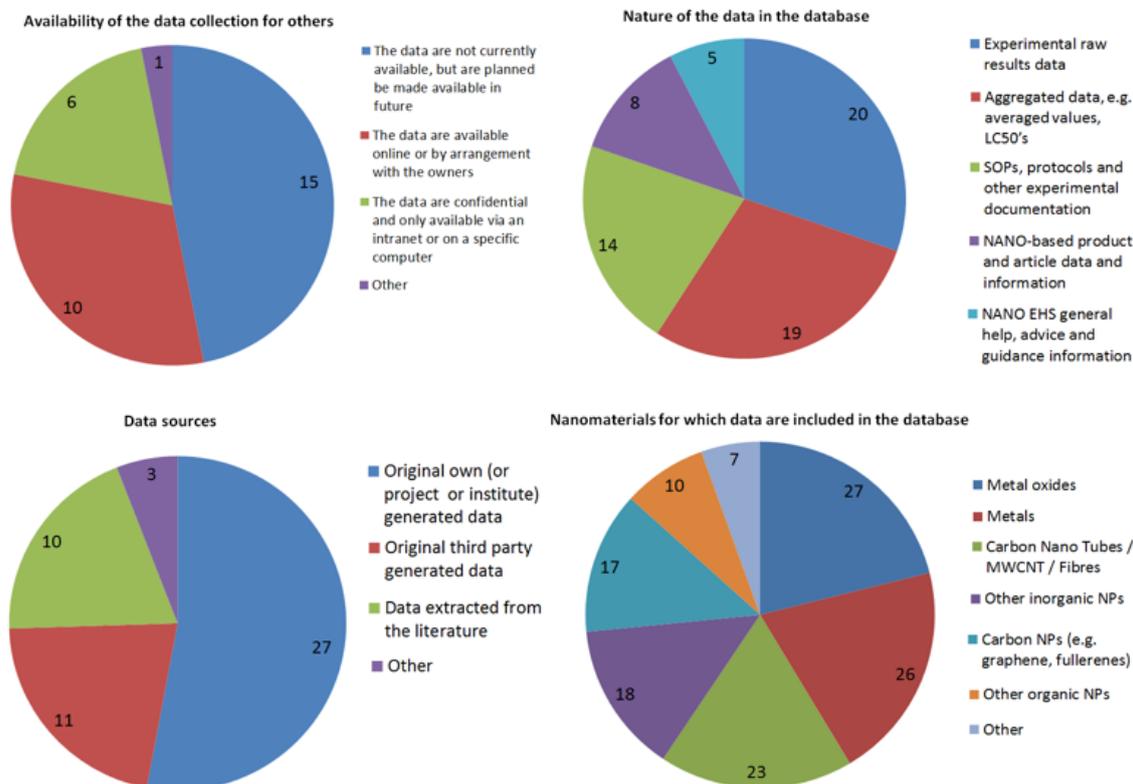- Other organic NPs
- Other

Figure 1: Availability of the data collection for others (top, left); the nature of the data in the databases (top, right), the data sources of the databases (bottom, left), and nanomaterials for which data are included in the database (bottom, right).

Conclusion

This factsheet describes three inventories which were applied in different parts of the caLIBRAte project:

1) The inventory of input and output parameters formed the starting point for the data collection for the performance testing of the selected models.

2) The lists of minimal compulsory entries for physicochemical properties and (eco) toxicity were further specified and used in the development of a method for the evaluation of data completeness and quality.

3) Information collected via the database survey which was organized together with the NSC was used in the analysis of data gaps.

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