

ProSafe

Grant Agreement Number 646325

Deliverable D 3.2

ISA-TAB-NANO database system established and adopted within the Nanosafety Cluster

Due date of deliverable: 2016/12/31

Actual submission date: 2017/04/30

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Work package/task:	WP3 / Task 3.2 – subtask 3.2.1
Document status:	draft / <u>final</u>
Confidentiality:	confidential / restricted / <u>public</u>
Key words:	

DOCUMENT HISTORY

Version	Date	Reason of change
1	22/08/2016	Initial version
2	30/04/2017	Version submitted to MC
3	14/07/2017	Project Office harmonized lay-out

Lead beneficiary for this deliverable: Joint Research Centre, JRC

Owner(s) of this document	
Owner of the content	JRC

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Table of Content

1	DESCRIPTION OF TASK	3
2	DESCRIPTION OF WORK & MAIN ACHIEVEMENTS	3
2.1	SUMMARY	3
2.2	BACKGROUND OF THE TASK	3
2.3	DESCRIPTION OF THE WORK CARRIED OUT	4
2.4	RESULTS	5
2.5	EVALUATION AND CONCLUSIONS	5
3	DEVIATIONS FROM THE WORK PLAN	5
4	PERFORMANCE OF THE PARTNERS	5
5	REFERENCES / SELECTED SOURCES OF INFORMATION (OPTIONAL)	5

1 Description of task

From DoW, amended 22.09.2016

Task 3.2.1 - ISA-TAB-NANO as backbone for a common database – Start M1, end M24
Task leader: JRC Partners: TEMAS, IOM

The raw data or quality-checked datasets produced by experimentalists are often difficult to exploit fully, for instance by regulators, unless an adequate metadata layer is added to guide the data extraction and transformation.

T3.2.1 brings forward and builds on the strategy adopted by NANoREG and several other projects and initiatives, also in the US, in using the ISA-TAB-NANO system (Thomas et al. BMC Biotechnology 2013, 13:2 <http://www.biomedcentral.com/1472-6750/13/2>). This system supplies minimal metadata to attached raw or processed data and can be scaled up from simple spreadsheets to more a complex dataset storing file type. It can be paired with descriptors that come from a chosen ontology. In this development it is important to keep in mind the user-friendliness and ease of manual data recording that especially experimentalists in their labs hope to see. A complex system risks failure by non-adoption.

This sub-task will link with eNanoMapper to raise the critical mass around the ISA-TAB-NANO development in Europe and increase the chances that it is adopted as a widely-used best practice for flexible data sharing within and among projects (for instance for inter-laboratory comparisons and OECD-level data exchange).

2 Description of work & main achievements

2.1 Summary

The non-trivial idea of gathering a critical mass of adopters in the EU NanoSafety Cluster (NSC) community around the concept of ISA-TAB-Nano for streamlined data management was successfully realised by this task.

The ISA-TAB-Nano 'system' is now a reality not only in projects generating a large amount of data, such as NANoREG or NanoReg2, but new initiatives (and existing ones) in the NSC inevitably have to consider its usefulness for full exploitation of datasets generated in nanoEHS using, among others, large amounts of public funding.

Also, this ProSafe work on ISA-TAB-Nano has attracted the attention of and stimulated on-going collaboration with the US, in particular with Duke University, which has been linked to ProSafe in WP1.

ProSafe recommends the European Commission to duly consider ways to further integrate the work promoted by ProSafe on data management, ISA-TAB-Nano in particular, into upcoming strategic nanoEHS R&I funding, and to link this appropriately to the burning issue of data sustainability and curation.

These recommendations of this deliverable and the work on ISA-TAB-Nano serve also as input to the aspects related to data management in the ProSafe White Paper.

2.2 Background of the task

Task 3.2 is divided in two sub-tasks, dealing with two different aspects concerning the creation of a database management system, which i) *ISA-TAB-NANO as backbone for a common database (T3.2.1)* and ii) *Minimum requirements in ontology and naming conventions (T3.2.2)*. The two subtasks are related to two deliverables: i) *D3.2 – ISA-TAB-NANO database system established*

and adopted within the Nanosafety Cluster, and ii) D3.3 – Minimal ontology and naming convention for nanosafety data

The general aim of task 3.2 in its whole is the support to the development of a nanoEHS data management system to uniform and follow same conventions when speaking of data reporting within the EU NanoSafety Cluster. This is also aligned, to a wider extent, with other initiatives that are ongoing e.g. in the US or at OECD level.

This ProSafe sub-task 3.2.1 was setup shortly after the launch of the FP7 project eNanoMapper and linked with it to raise the critical mass around the ISA-TAB-Nano development in Europe and increase the chances that it is adopted as a widely-used best practice for flexible data sharing within and among projects (for instance for inter-laboratory comparisons and OECD-level data exchange).

ProSafe, being a Coordination and Support Action, and not a research and innovation one, did not intend to devote efforts to the technical / IT development of the ISA-TAB-Nano system (and the ontologies). This was, and is still being done, by other EU-funded project such as eNanoMapper, NANoREG, NanoPUZZLES, etc.

In this view, this task 3.2.1 is part of a series of initiatives that aim to promote the creation of quality-checked and well-structured datasets produced by experimentalist (working under different projects) that can be exploited for instance by modellers or by regulators.

2.3 Description of the work carried out

The ProSafe partners of T3.2, in particular JRC, have first proposed the adoption of ISA-TAB-Nano for streamlined nanoEHS experimental data recording within the large FP7 project NANoREG, where the system was adopted in March 2014.

As set in the DoW of T3.2, the task leader has established a strong link with FP7 eNanoMapper right from the start of ProSafe. This has led to a positive collaboration between ProSafe WP3 and eNanoMapper (especially UMaastricht and IDEA) that has lasted for the whole duration of ProSafe. eNanoMapper was the 'technical implementation arm' of a streamlined data management strategy within the EU NanoSafety Cluster (NSC), to serve the data needs of any project in that arena.

In its technical development of ISA-TAB-Nano tools for the NSC community, eNanoMapper received support from this ProSafe task 3.2. The task leader relayed on several occasions, such as bilateral JRC-UMaastricht/IDEA teleconferences, participation in eNM-promoted NSC meetings in 2016, monthly TC calls of the NanoSafety Cluster WG4 US-EU CoR meetings on databases, etc. the needs of the nanoEHS community, especially of the large project NANoREG, where it has been leading the ISA-TAB-Nano technical implementation.

Around early 2016, it appeared that a sufficiently wide community in the NSC endorses the use of ISA-TAB-Nano, as a way to structure the collection of nanoEHS data, be it experimental or literature-based. For experimental data, the approach promoted by JRC in NANoREG for a 'keep it simple' version of ISA-TAB-Nano has been paying off. The US have shown marked interest for this strategy, for instance after the public release by JRC of the NANoREG templates¹.

Given its specifically dedicated role in the development of, among others, ISA-TAB-Nano, eNanoMapper has published recently a fully descriptive deliverable on this matter².

¹ Totaro S. et al; Data logging templates for the environmental, health and safety assessment of nanomaterials; EUR 28137 EN; doi:[10.2787/505397](https://doi.org/10.2787/505397); January 2017

² Nina Jeliaskova, Nikolay Kochev, Vedrin Jeliaskov, Penny Nymark, Pekka Kohonen, Barry Hardy. Deliverable Report D3.4 ISA-Tab templates for common bioselected set of assays. (Zenodo, 2016). doi:[10.5281/zenodo.375814](https://doi.org/10.5281/zenodo.375814)

2.4 Results

The non-trivial idea of gathering a critical mass of adopters in the EU NanoSafety Cluster (NSC) community around the concept of ISA-TAB-Nano for streamlined data management was successfully realised by this task.

The technical development was very successfully executed by the eNanoMapper project, as reported in their deliverable D3.4 (see ref. in section 5).

This has been a good example of cross-project collaboration: Coordination and Support with Research and Innovation.

The ISA-TAB-Nano 'system' is now a reality not only in projects generating a large amount of data, such as NANoREG or NanoReg2, but new initiatives (and existing ones) in the NSC inevitably have to consider its usefulness for full exploitation of datasets generated in nanoEHS using, among others, large amounts of public funding.

2.5 Evaluation and conclusions

This ProSafe work in WP3 to find a way to deploy a streamlined data management strategy by exploiting ISA-TAB-Nano has attracted the attention of and stimulated on-going collaboration with the US, in particular with Duke University, which has been linked to ProSafe in WP1.

ProSafe recommends the European Commission to duly consider ways to further integrate the work promoted by ProSafe on data management, ISA-TAB-Nano in particular, into upcoming strategic nanoEHS R&I funding, and to link this appropriately to the burning issue of data sustainability and curation.

These recommendations of this deliverable and the work on ISA-TAB-Nano serve also as input to the aspects related to data management in the ProSafe White Paper.

3 Deviations from the work plan

No major deviations were registered.

The effort in T3.2 started with a couple of months of delay and the final coordination and writing up of this deliverable in good agreement with eNanoMapper also took some more time than expected.

4 Performance of the partners

The partners performed adequately.

5 References / Selected sources of information (optional)

Totaro S. et al; Data logging templates for the environmental, health and safety assessment of nanomaterials; EUR 28137 EN; doi:[10.2787/505397](https://doi.org/10.2787/505397); January 2017

Nina Jeliaskova, Nikolay Kochev, Vedrin Jeliaskov, Penny Nymark, Pekka Kohonen, Barry Hardy. Deliverable Report D3.4 ISA-Tab templates for common bioselected set of assays. (Zenodo, 2016). doi:[10.5281/zenodo.375814](https://doi.org/10.5281/zenodo.375814)