



**NanoCommons**

Nano-Knowledge Community

**The European Nanotechnology Community Informatics Platform:  
Bridging data and disciplinary gaps for industry and regulators**

Grant Agreement Number 731032

**Deliverable Report 10.2**

<b>Deliverable</b>	D10.2 Interaction Needs and Goals of Nano Safety Projects and Programs
<b>Work Package:</b>	WP10 [NA4 – Integration & Sustainability]
<b>Delivery date:</b>	M19 – 13 July 2019
<b>Lead Beneficiary:</b>	BioNanoNet
<b>Nature of Deliverable:</b>	Report
<b>Dissemination Level:</b>	Public

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## List of Abbreviations

AB - Advisory Board  
BNN – BioNanoNet  
CEINT – Center for the Environmental Implications of Nanotechnology (Duke University)  
CORDIS – Community Research and Development Information Service  
COSME – Europe’s Programme for SMEs  
DoA – Description of Action  
EASME – Executive Agency for Small and Medium-sized Enterprises  
EC – European Commission  
ECHA – European Chemicals Agency  
EEN – Enterprise Europe Network  
EFSA – European Food Safety Authority  
EMA – European Medicines Agency  
EMFF – European Maritime and Fisheries Fund  
EPPN – European Network for Pilot Production Facilities and Innovation Hubs  
ESMA – European Securities and Markets Authority  
EU – European Union  
EU-NCL – European Union Nanomedicine Characterisation Laboratory (H2020 project)  
EUON – European Union Observatory for Nanomaterials  
EwC – Edelweiss Connect  
FAIR – Findable, Accessible, Interoperable, and Re-usable  
GLP – Good Laboratory Practice  
GDPR – General Data Protection Regulation  
H2020 – Horizon 2020  
IP – Intellectual Property  
I2L – Industrial Innovation Liaison sub-working group of EU NanoSafety Cluster  
JRA – Joint Research Activities  
LIFE – EU funding program for the environment, nature conservation and climate action  
NA – Networking activities  
NEM – New and Emerging Materials  
NGO – Non-governmental organisation  
NM - Nanomaterials  
NPs - Nanoparticles  
NSC - NanoSafety Cluster  
OECD – Organization for Economic Cooperation and Development  
R&D – Research & Development  
ROI – Return on Investment  
SOPs - Standard Operating Procedures  
SCCS – Scientific Committee on Consumer Safety  
SME – Small and Medium-sized Enterprise  
TA – Transnational Activities  
TF – Task Force  
UoB – University of Birmingham  
US – United States  
USA – United States of America  
WP - Work Package

## 1. Introduction

The Horizon 2020 (H2020) project NanoCommons is establishing a long-term infrastructure to benefit nanotechnology and nanosafety research. This means that the data, tools and services integrated and/or developed during the project's duration will remain live and usable beyond its lifetime. This has been a substantial issue for European Union (EU) projects to date, the data from which remains, in many cases, disparate and poorly accessible, and as such is essentially lost with no re-use potential.

To address these issues, NanoCommons, is actively working towards gaining value from and adding value to EU, National and International nanotechnology and nanosafety projects, by enhancing the openness and FAIRness (Findability, Accessibility, Interoperability and Re-usability) of their data. NanoCommons will provide value through the integration of data, tools and services that will be used to meet the needs of, and add value to, the different stakeholder groups, which were presented in detail in deliverable D1.2 – Dissemination Strategy. At the same time, NanoCommons will add value to the outputs of partners, participating projects and other stakeholders through the enrichment of the data and tools integrated within the NanoCommons KnowledgeBase. Such enrichment may refer, in the case of scientific data, to enabling relevant data harvesting and combination with data from publicly available resources. This can lead to more robust analysis, result refinement, the uncovering of hidden patterns, or in the case of modelling the refinement and calibration of the produced models. For the tools and services offered through NanoCommons, the added value will translate into their further development through the use of varied types of data and the experience gained from use in different nanoscience fields and the feedback received from users.

Of great importance to meet these goals is the close interaction and collaboration of NanoCommons with other EU, national and international projects, whose datasets will be essential to delivering on the remit and promise of NanoCommons, and whose integration will be facilitated via the NanoCommons tools. The interactions with other projects will also support NanoCommons partners to fully understand the needs of the individual projects, and how NanoCommons tools and services can meet these needs and those of the wider stakeholder community (academia, industry, regulatory agencies, the public who need access to high quality datasets) and provide essential feedback in order to determine how the NanoCommons tools and services can be improved to meet the highest possible standards. This will include a continuous cycle of interaction, similar to that of data driven innovation shown in Figure 1. The interaction will begin from a disruption (need) that needs to be addressed. Based on the feedback from the specific stakeholder, NanoCommons will identify and plan the best way forward to address that need and create positive impact and added value (e.g. from re-use of existing data) through a number of iterations of the cycle based on updated feedback. The overall results can be used to meet similar needs of other stakeholders, thus continuously expanding the services provided by NanoCommons.

For the presented procedure to be successful, NanoCommons needs to identify the community needs for integrated resources and tools. This has been achieved, and is continuously being refined, through implementation of an online survey (<https://www.surveymonkey.co.uk/r/PK2KXWW>, see Annex 1) where members of the nanoscience community are able to set the course of actions and tools and services offered by NanoCommons through prioritisation of their needs. The survey results are then used to define a plan and process for the interaction with interested users and other EU funded and

national and international programs and bodies, in order to meet the identified needs and iteratively implement interactions and actions.

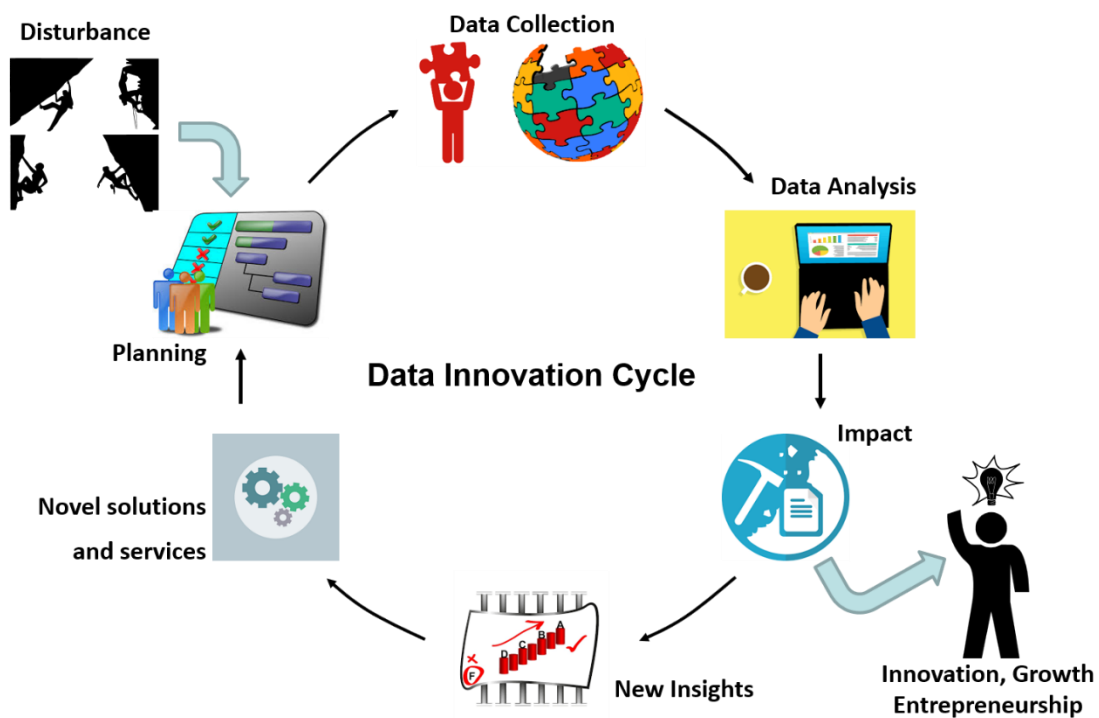


Figure 1 Data driven innovation cycle

## 2. Interaction Partners and Stakeholders

For NanoCommons to be successful and to achieve the desired added value and return on investment (ROI) of EU public funding, it was imperative to bring together a complete set of complementary skills covering the experimental nanotechnology and nanosafety and nanoinformatics fields. Similarly, NanoCommons is continuously looking to identify the fluctuating and emerging needs of the entire nanotechnology, nanosafety and advanced materials stakeholders. This is achieved in three pillars of activity, the first being the partners responsible for the needs identification via the Networking activities (NA). The second comprises of the entire NanoCommons consortium implementing the required tools and services (via the Joint Research Activities, JRA) and the third pillar being the provision of tools and services to Users and stakeholders via Transnational access (TA), thereby increasing the range of organisations and users benefiting from, and adding value to, the NanoCommons project.

### 2.1 Needs identification Task Force

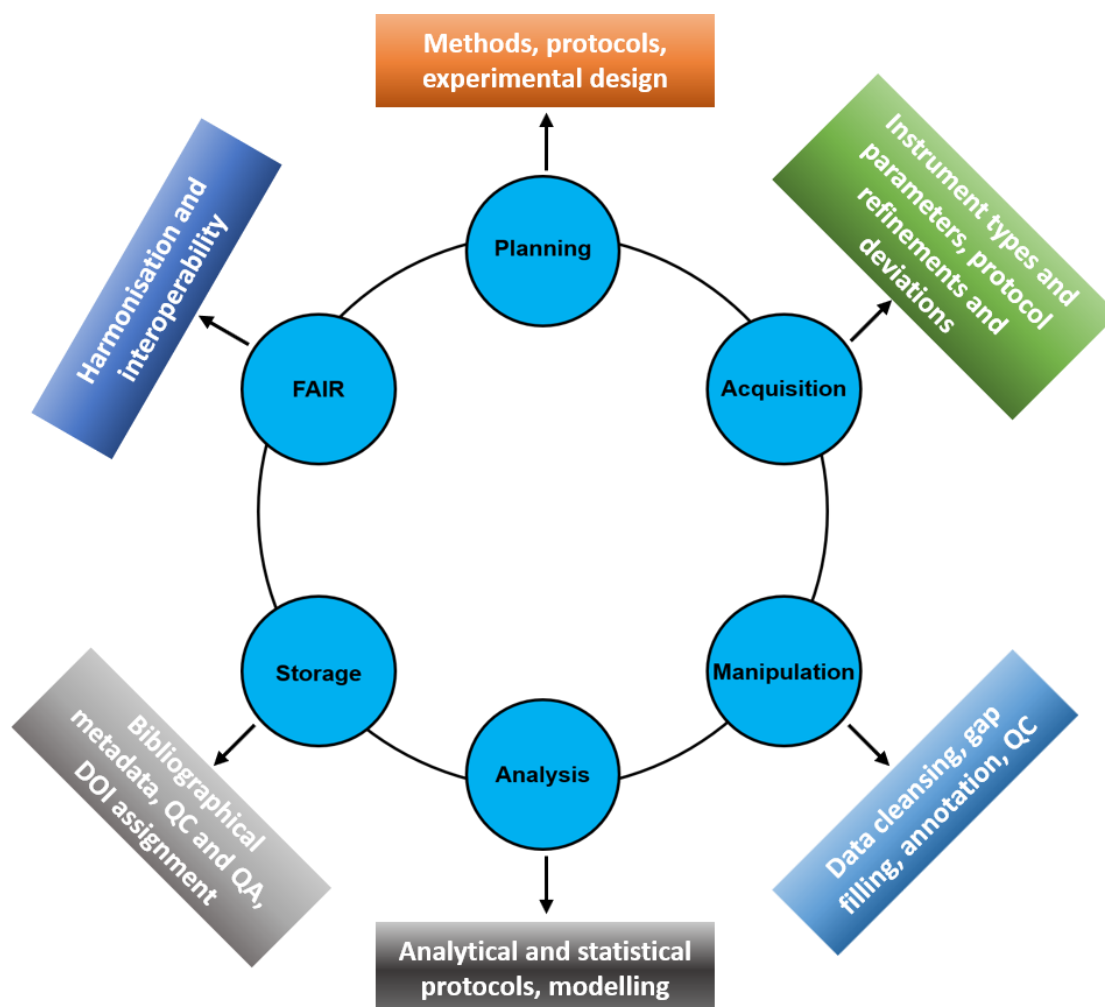
To identify and continuously monitor the needs in terms of tools and services of the nanotechnology and nanosafety community a relevant Task Force (TF) was put together, under the leadership of WP10 leader Beatriz Alfaro BioNanoNet (BNN). The rest of the TF members include Prof Iseult Lynch and Dr Anastasios Papadiamantis from the University of Birmingham and Dr Barry Hardy from Edelweiss Connect (EwC).

The scope of the Task Force was, initially, to identify, following consultation with the rest of the consortium and other stakeholders (e.g. EU NanoSafety Cluster Working Groups), a number of initial tools that would be of interest to the wider nanosafety and advanced materials communities and oversee their implementation within the NanoCommons Knowledgebase. Furthermore, the TF put together the ongoing “[NanoCommons Tools and Services Needs](#)” survey, which is being disseminated by the project (the QR code is included in all project presentations and was circulated via the NanoSafety Cluster newsletter for example), and is described in detail in section 4. The purpose of the survey is to allow all stakeholders to notify the NanoCommons project of their needs, in terms of tools and services covering the entire data lifecycle (Figure 2), and to allow the NanoCommons team to assess how these needs are changing over time (which may be related to the initially deployed NanoCommons tools and services addressing the initial gaps). The survey also provides participants with the option to get in touch with or be contacted by NanoCommons experts regarding specific needs.

The consultation will remain open throughout the project’s lifetime and attempts will be made to implement the requested services and tools of all contributing stakeholders. These include end-users, database managers, software and tool developers from all relevant areas, as well as workflow integrators, both developers of tools for workflow management and researchers implementing workflows in e.g. industry settings.

The TF is also collaborating closely with Work Package 2 – Networking Activity 1: Community Building. A key objective of WP2 is to organise and run “Needs Analysis Workshops” aimed at various stakeholders, which have the character of a community wide in-depth and direct consultation. This consultation will use the survey results (see section 4.1) as a starting point

and enrich them pinning down the community perceived gaps for risk and hazard assessment and safety-by-design.



**Figure 2** The data lifecycle including the relevant metadata. NanoCommons is offering tools and services to support users in all aspects of the cycle.

## 2.2 e-infrastructure contributors

Based on the ongoing consultation (described in detail in section 4.1), the NanoCommons consortium is actively seeking to fill identified gaps in terms of the needs and goals of the stakeholders. This will be achieved by internal and external contributions to the integration of existing and/or the development of new tools and services related to nanosafety data management and re-use for modelling and risk assessment. The NanoCommons consortium wants to have maximum impact and to implement a wide range of tools and services, without “re-inventing the wheel”. This is why the NanoCommons consortium is looking to identify, further develop if needed and implement already existing services, while focussing on identifying and filling existing gaps with new services.

The **contributors** to the NanoCommons Platform and their interactions are presented schematically in figure 3. These include:

- Members of the Consortium: Know-how, datasets from previous projects, tools and services developed in previous projects such as eNanoMapper, NanoMILE etc.
- NanoCommons Knowledgebase: The data and tools contained in the knowledgebase will not be hosted fully within the NanoCommons knowledgebase, but where possible will be integrated from different sources to reduce the financial and administration costs of the project. However, where sustainability of the tools at their current location is an issue, NanoCommons will host the tools to ensure they are sustained alongside the NanoCommons-developed tools.
- JRA will feed the in-house (consortium) developed tools, data and services into the NanoCommons knowledgebase.
- TA will feed data into the NanoCommons knowledgebase, as well as providing additional tools through direct fulfilment of users' needs.
- Databases from other projects: see Section 4. *Results* (sub-sections 4.2 and 4.3) for more details on how NanoCommons will federate with other relevant databases to maximise accessibility and re-usability of existing data.
- Some Contributors are also "Users" of the NanoCommons e-infrastructure (see section "2.5 – NanoCommons Users" for more details): Beneficiaries of the data, services, tools and the NanoCommons infrastructure include:
  - Academics, at all levels, working in all fields of nanosafety research and the wider toxicity community. The services offered can help them uncover underlying research patterns and reach new scientific conclusions. Computational researchers, in particular, are expected to benefit from the curated datasets and the tools for reporting and benchmarking their models.
  - Regulatory agencies (e.g. ECHA, EMA, EFSA) and policy makers.
  - SMEs that do not have the resources or the knowledge to develop and use *in-house* tools for *safer-by-design* approaches and risk assessment requirements, and who can use the data as weight of evidence. It is important to note though that non-GLP data cannot be used directly in regulatory dossiers.
  - Industry and the R&D community, which can use the offered services to address the '3Rs' principle (Replacement, Reduction and Refinement) and let them design novel and safer experimental approaches, and increasingly integrate *in silico* approaches into product design and decision making.
  - Consumers, through the interoperability of all of the above into a platform that will offer them new safer products containing nanomaterials.
- Others (but not limited to these) who will benefit from/contribute to NanoCommons tools and services include:
  - Public groups
  - Private groups
  - Consultants
  - Opinion leaders (for each sector, some key-industry leader(s) exist(s) – if they are convinced by NanoCommons data management support tools, they might promote it via their contacts etc.)
  - Industry: A list of stakeholders which can be relevant for NanoCommons has been prepared (and will be updated during the lifetime of the project), gathering the inputs from all Consortium partners. This list can be found in Annex 3.



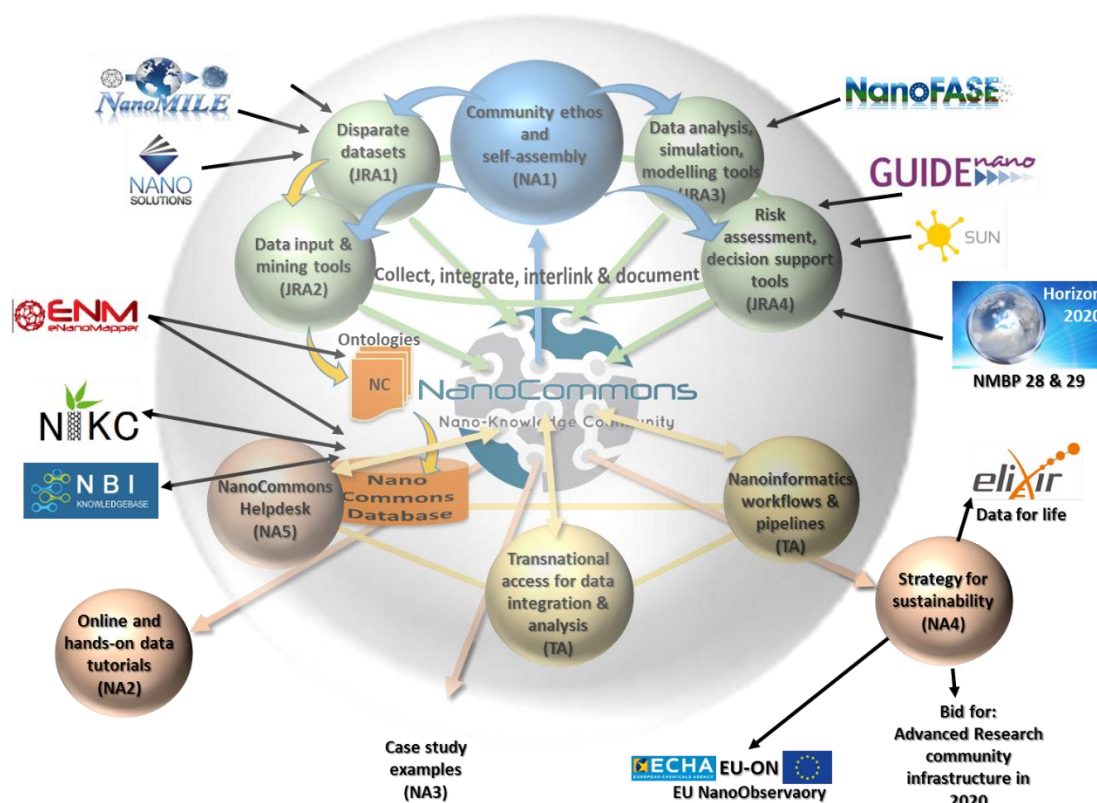
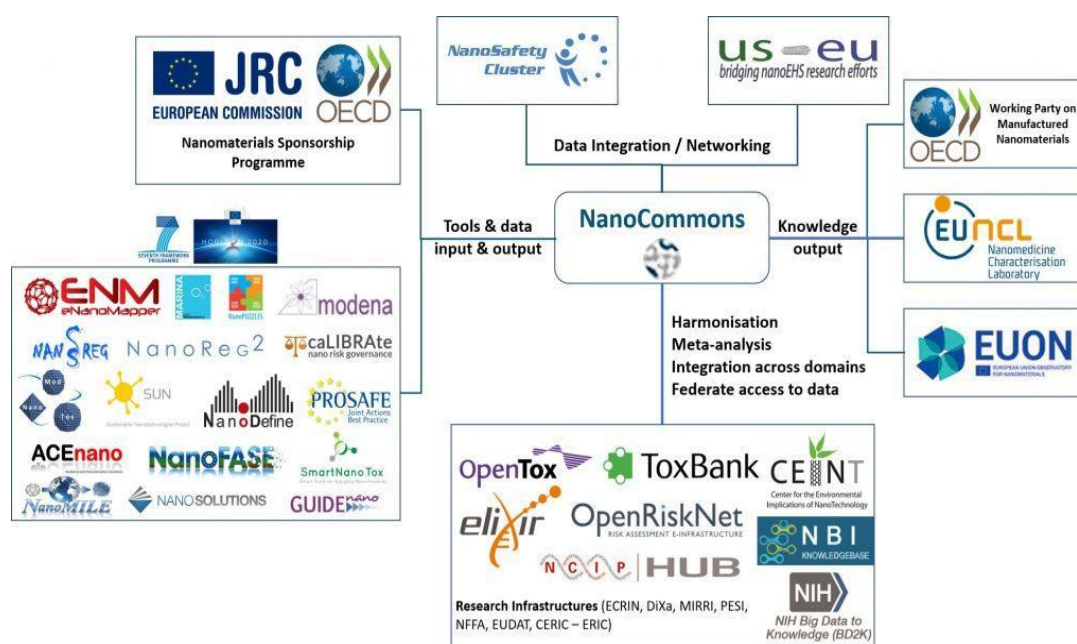


Figure 3 The NanoCommons contributors and individual interactions.

### 2.3 NanoCommons Knowledgebase resources

NanoCommons will deliver a sustainable and openly accessible nanoinformatics framework (knowledgebase and integrated computational tools, supported by expert advice, data interpretation and training), for assessment of the risks of NMs, their products and their formulations. NanoCommons combines Joint Research Activities (JRA) to implement the nanoinformatics Knowledge Commons, Networking Activities (NA) to facilitate engagement with the research community, industry and regulators, and provision of funded Access to the nanoinformatics tools via funded calls for Transnational Access (TA).

NanoCommons is establishing a single integrated resource for nanoinformatics data in which different stakeholders (e.g. scientists, regulators, NGOs, industries, etc.) can have confidence that it is both up-to-date and self-consistent. Figure 4 illustrates the positioning of NanoCommons and how it will provide an integrating platform for the Nanosafety knowledge community in Europe and internationally.



**Figure 4 NanoCommons' positioning within the nanotechnology and nanosafety communities, reflecting where it is pulling data from (a sub-set) and where the tools are feeding forward into (OECD, EU-NCL and EUON for example).**

NanoCommons and its partners (beneficiaries) are offering following resources:

- Know-how of data management best practices covering the entire data lifecycle from experimental design to FAIRness transformation and storage to enable ongoing exploitation and re-use of the data.
- Access to high quality data from leading scientific experts and projects (EU funded, national, international).
- State-of-the-art data processing and analysis, visualisation and *in silico* modelling for predictive toxicity tools.
- Infrastructure in terms of software/hardware and cloud access for long term preservation, storage and access to nanosafety datasets.

## 2.4 Potential contributing projects

For the NanoCommons Knowledge warehouse to be successful a close two-way relationship with nanotechnology and nanosafety projects, research teams and individual researchers needs to be established in order to encourage data generators to utilise the NanoCommons tools and resources and to deposit their data in NanoCommons-compatible and federated databases. NanoCommons is looking, and has already started, to collaborate with different stakeholders at various levels. This is achieved within both the JRA case studies and the TA activities, starting with projects in which NanoCommons partners are already collaborators in order to demonstrate the value-add that NanoCommons offers to other projects. For example, in collaboration with ACEnano, the Electronic Notebooks and ontology-linked templates that feed directly into the KnowledgeBase are being used to support the Round Robins on benchmarking NM characterisation methods, and in collaboration with NanoFASE detailed data capture templates for their aquatic and soil mesocosms datasets have been

designed, and are currently being populated, such that the entire NanoFASE dataset will be made available via the NanoCommons database.

The WP10 TF is working closely with the NanoCommons consortium to identify relevant completed and ongoing projects that could enrich, and be enriched from, the NanoCommons Knowledge base. These can be grouped into 3 categories:

- EU funded and NanoSafety Cluster Projects (Figure 5): sources NanoSafetyCluster<sup>1</sup>, EC<sup>2</sup> / CORDIS<sup>3</sup>-database for framework programs. These will be at the core of NanoCommons targeting due to their size both in terms of consortia, data and tools production and needs;
- Pilot Projects: sources EPPN<sup>4</sup>, i2L<sup>5</sup>, EC, CORDIS;
- Personal contacts of Consortium members at regional, national and international levels.

Based on the list of identified projects, a list of actions has been compiled to assist with establishing contact and identifying the specific needs of each project and any datasets they have that would benefit from being integrated into NanoCommons. The compiled list (which will be revised, adapted completed and updated through *WP2 – NA1 Community Building*, as mentioned below) includes the below actions on behalf of NanoCommons:

- Collecting Needs: NanoCommons will gather information on the projects' needs with respect to exploiting nano-enabled products;
- Collecting Data: NanoCommons will identify the potential for data integration from the specific project. This will include either integrating any project specific databases or curating and hosting the data within the NanoCommons data warehouse;
- Collecting Services/Tools: NanoCommons will work with projects to identify the available tools/services that fit their specific needs and any gaps that need to be filled. At the same time, NanoCommons will consider whether projects have developed tools that would be of interest to the wider community and try to integrate them into the NanoCommons Knowledgebase;
- Support of ongoing and future projects: NanoCommons partners are providing their expertise, contacts and networks to assist ongoing projects meet their goals. The NanoCommons community will also work as a hub for bringing different parties together to establish new collaborations.

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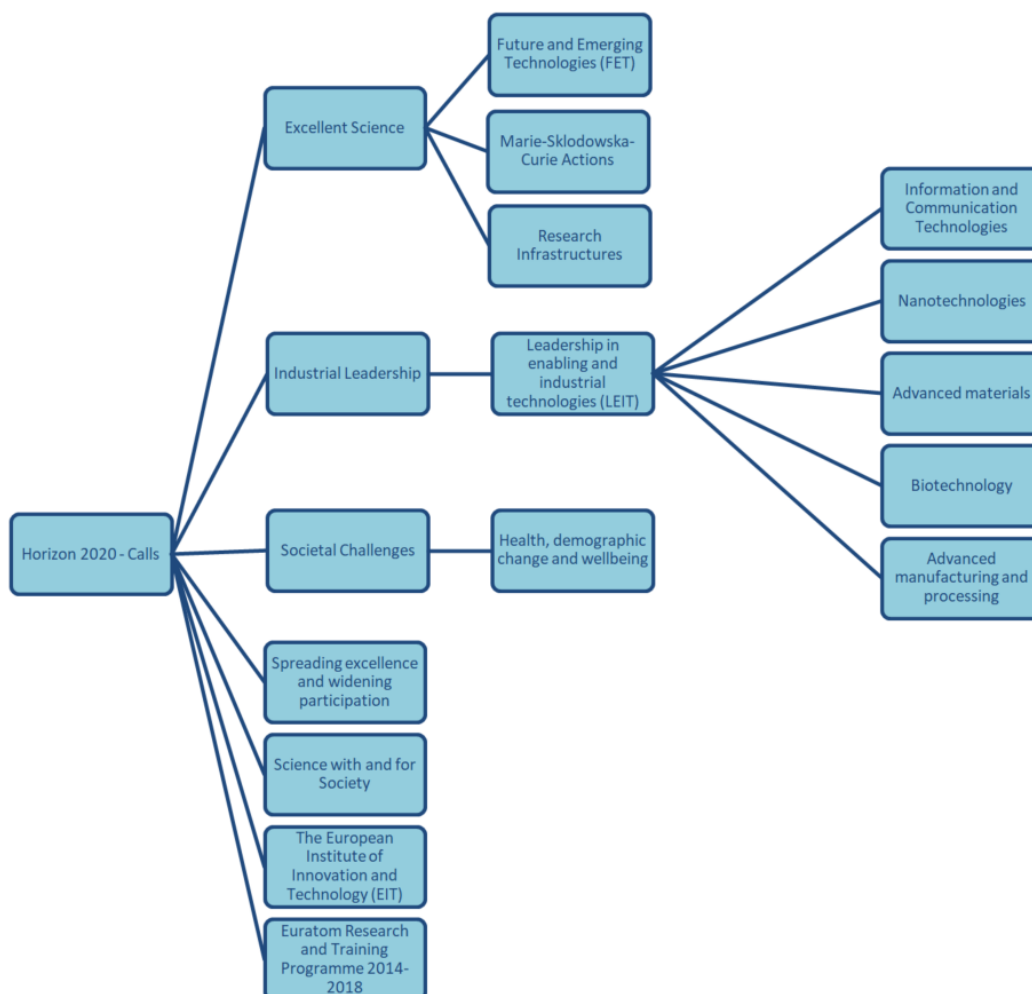
<sup>1</sup> <https://www.nanosafetycluster.eu/eu-nanosafety-cluster-projects/horizon-2020-projects/nanofase.html>

<sup>2</sup> <https://ec.europa.eu/programmes/horizon2020/en/news/h2020-fet-projects-nanotechnologies>

<sup>3</sup> [https://cordis.europa.eu/projects/home\\_en.html](https://cordis.europa.eu/projects/home_en.html)

<sup>4</sup> <https://www.eppnetwork.com/pilots>

<sup>5</sup> i2L-group – See: <https://www.nanosafetycluster.eu/working-groups/wg-e-safer-by-design-innovation-and-regulation/Industrial-Innovation-Liaison-i2L-WG9-Sub-Group.html>



**Figure 5. European funding programs relevant for NanoCommons**

Similarly, NanoCommons is expecting equivalent actions from interested projects to facilitate establishment of the two-way relationships:

- Communication of Needs: The project has needs they would like to request from the NanoCommons platform and thus will communicate them actively to NanoCommons;
- Provide Data: The project provides data (re-)sources for incorporation into the NanoCommons data hub following the FAIR principles and will work actively with NanoCommons data curators to implement the data integration workflow;
- Provide Services/Tools: The project will be a provider of open access tools/services for the NanoCommons platform, and in particular to support TA services;
- User of Data: The project will use data from the NanoCommons data hub;
- User of Services/Tools: The project will be a user of the tools/services offered by the NanoCommons platform; it is likely to use a TA from NanoCommons. This includes proposing tools to be integrated within the NanoCommons Knowledgebase;

- Support for future projects: NanoCommons partners are providing their contacts and networks to bring the right people in the right projects. By providing this platform it is intended to collectively achieve our aim of long-term sustainability.

The interaction with these projects will be achieved through *WP2 – NA1 Community Building*. For more details about the list of the identified projects and the interaction between these projects and NanoCommons, see chapter 4 “Survey Results and NanoCommons relevant projects and frameworks) (section 4.2 “EU and nationally funded projects relevant to NanoCommons”). Section 4.3 “EU and national funding programs relevant to NanoCommons”) offers a list of the identified EU, non-EU and national programs including Nanosafety relevant aspects and therefore relevant for NanoCommons.

## 2.5 NanoCommons users

NanoCommons users include a wide variety of groups and individuals with very different needs. They include academic as well as industrial scientists/researchers, regulators, policy makers, universities, industry (SMEs and larger enterprises) etc. from different fields of nanotechnology and nanosafety research. NanoCommons is the result of the unmet need of these groups for a **novel infrastructure** providing a standardised, reproducible and interoperable data management platform that offers a single point of access for high quality **available data, knowledge, analysis and modelling tools and the relevant expertise and training materials**.

The NanoCommons stakeholders span a wide spectrum of expertise and interest areas, covering toxicology, and especially predictive toxicology, systems and structural biology, nanoinformatics, bioinformatics and its subtopics toxicogenomics, cheminformatics, biophysics and computer science, engineering, infrastructure and more. NanoCommons target users also come from the EU’s chemical manufacturing industries and the corresponding regulatory agencies. The list of the different users’ sectors of relevance to NanoCommons is presented below:

- Health industry
- Automotive industry
- Energy harvesting
- Chemical industry
- Chemical manufacturing industries:
  - Pharmaceutical companies
  - Cosmetic industry
  - Agriculture/Food companies
  - Agrochemical companies
- Regulatory agencies:
  - EC (European Commission)
  - European Medicines Agency (EMA)
  - European Chemicals Agency (ECHA)
  - Scientific Committee on Consumer Safety (SCCS)
  - European Food Safety Authority (EFSA)
  - Organization for Economic Cooperation and Development (OECD)

### 3. Interaction with partners and stakeholders

#### 3.1 Identification of the needs and goals of the nano-community

NanoCommons acknowledges that the nano-science field is continuously expanding towards novel advanced materials and related fields. This, in combination with the rapid advancement of technology, has led to a data heavy field, with continuously changing and adapting needs. To address this issue and to always keep track of the emerging and changing needs of all stakeholders, that will allow the tailoring of existing and development of novel tools and services, the WP10 TF has developed a short questionnaire (online survey). The survey was launched during the early project stages (month 3) and is being continuously promoted and disseminated since, to all stakeholders during the events that the NanoCommons partners participate in. An analytical presentation of the survey structure can be found in Annex 1 of this deliverable, while the results acquired so far are presented in chapter 4 of this deliverable.

NanoCommons is committed to FAIR and Open data, while acknowledging the need for specific embargo periods to protect full data exploitation by data generators and sensitive intellectual property issues that need to be respected. In all cases, the consortium promotes data FAIRness through explanatory presentations and urges the scientific community to adopt and promote them. This is strongly interlinked with data quality, as data harvesting and combination needs to be of sufficient quality to be proven successful and thus to be adopted by the community and regulators. This will be also achieved through specific online training material produced and available through the NanoCommons library and WP8: NA2 – Training aligned to TA/JRA).

Based on the survey responses, the NanoCommons TF convenes to evaluate them and to determine the appropriate follow-up actions required to address the identified User / stakeholder needs. The summary of actions the TF takes is presented below:

- The results of the Online Survey are used to identify the needs and goals of potential users of the NanoCommons e-infrastructure;
- Personal interviews and teleconferences with a wider range of targeted stakeholders, are used to find out more about their specific needs and goals;
- New tools/topics/items of work from customers/users, via the rolling calls, are announced on the NanoCommons website. Where these tools arose as a direct response to suggestions / needs from users, this is highlighted via press releases, and a follow-up session / interview with the specific stakeholder is organised to obtain their feedback on the tool and how satisfied they are with the solution provided by NanoCommons (i.e. User testimony);
- Workshops and trainings to teach users on how to maximise the benefits from the NanoCommons offerings.

#### 3.2 Outreach activities to maximise feedback on needs and goals

Another way for the NanoCommons consortium to identify the needs and goals of the nano-community is to attend/co-organize relative conferences and events where interaction and discussion with the relevant stakeholders is possible. It is also a good way to promote the project and its offerings and get feedback on what it's offering and what is missing from the

NanoCommons knowledgebase and service catalogue. These events are also a good opportunity to promote and distribute the aforementioned User needs survey. The partners of NanoCommons have attended a wide number and range of conferences and events where the survey (and the project) has been promoted (for a full list see Deliverable D2.1: 1<sup>st</sup> Annual conference & nano-exploitation day, stakeholder workshop and User call), including:

- OpenTox Asia 2018 (24<sup>th</sup> – 25<sup>th</sup> May 2018, Tokyo, Japan)
- Nano Korea 2018 Conference (10<sup>th</sup>-13<sup>th</sup> July 2018, Kintex, Korea)
- International Conference on the Environmental Effects of Nanoparticles and Nanomaterials (ICEENN 2018) (5<sup>th</sup> -8<sup>th</sup> September 2018, Durham, North Carolina, USA)
- 3<sup>rd</sup> NanoSafety Forum for Young Scientist (ACENano Meeting) (10<sup>th</sup> -11<sup>th</sup> September 2018, Malta)
- 4<sup>th</sup> International Conference on Research Infrastructures (ICRI 2018) (12<sup>th</sup> – 14<sup>th</sup> September 2018, Vienna, Austria)
- NanoTox Conference 2018 (18<sup>th</sup> -21<sup>st</sup> September 2018, Neuss, Germany)
- OpenTox EURO Conference (8<sup>th</sup> -11<sup>th</sup> October 2018, Athens, Greece)
- Industrial Technologies Conference 2018 (29<sup>th</sup> -31<sup>st</sup> October 2018, Vienna, Austria)
- NanoSafe Conference 2018 (5<sup>th</sup> -9<sup>th</sup> November 2018, Grenoble, France)
- 7<sup>th</sup> Korea-EU NanoWorkshop: “Abstracts for Nanosafety Informatics and Modelling” (12<sup>th</sup> November 2018, Seoul, Korea) (Oral presentation of Anastasios Papadiamantis (UoB): “Sustainable Community Development of NanoSafety Knowledge Resources”)
- SOT – 58<sup>th</sup> Annual Meeting & ExpoTox (10<sup>th</sup> – 14<sup>th</sup> March 2019, Baltimore, USA)
- NIA’s 8<sup>th</sup> Annual Symposium (27<sup>th</sup> March 2019, Brussels, Belgium)
- SusChem Workshop – “Towards a New SusChem SIRA” (16<sup>th</sup> – 17<sup>th</sup> May 2019, Brussels, Belgium)
- Piemonte Spring School (22<sup>nd</sup> – 24<sup>th</sup> May 2019, Alessandria, Italy)
- SETAC EUROPE 2019 (26<sup>th</sup> – 30<sup>th</sup> May 2019, Helsinki, Finland)
- EuroNanoForum 2019 (12<sup>th</sup> – 14<sup>th</sup> June 2019, Bucharest, Romania).

Apart from conferences and events where the survey (and the project) has been promoted, there have also been promotional activities with wider community involvement, including:

- Involvement in / contact with the EU NanoSafety Cluster community via several routes (e.g. Steering Group, Working Groups);
- Approached the EPPN-network via the respective working group leader(s);
- BNN approached its community, a total of approx. 12,000 global contacts;
- The innovation oriented special group of the i2L was additionally contacted;
- Via the European Commission, the distribution was kindly supported, and additional 10+ consortia could be reached, requesting them to distribute the survey within their projects as well.

Furthermore, the NanoCommons survey has also been promoted within the national agencies/organisations contacted by NanoCommons consortium partners.

### 3.3 Criteria for selection of tools and services

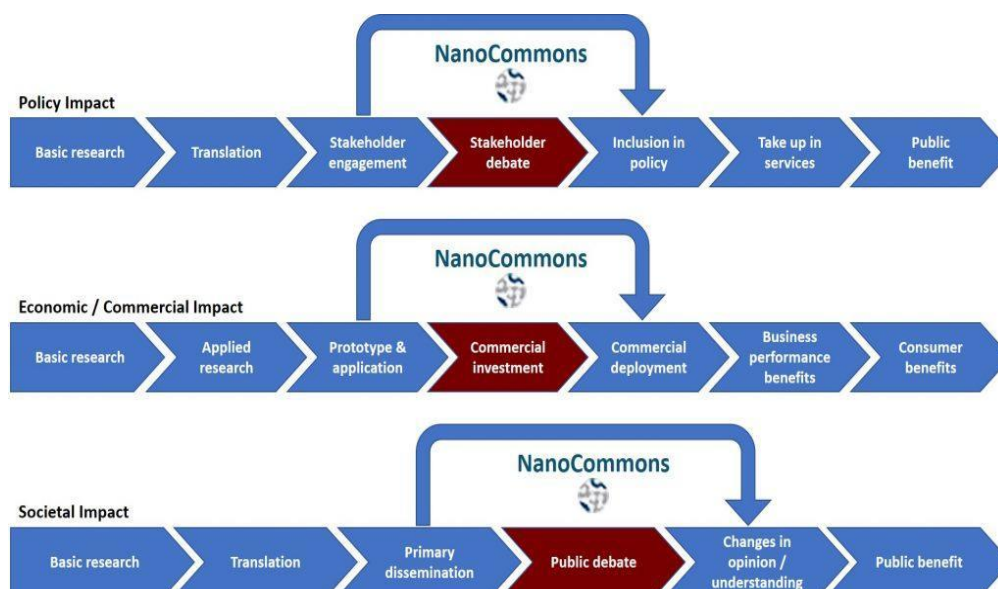
The survey of NanoCommons users and stakeholder communities offers the possibility to potential users of the e-infrastructure to express their needs and goals, which can be then

met by the NanoCommons consortium and collaborations with the wider community. In order to maximise these synergies, NanoCommons is concentrating its efforts in developing and therefore offering the tools and services with the biggest acceptance or greatest need, according to the results of the survey: 40% of respondents indicating a specific need has been taken as the threshold for the integration or development of the services and tools.

NanoCommons has the unique potential to deliver a step-changing impact for the emerging fields of data management and nanoinformatics in the nano-community. NanoCommons will remove barriers from nanosafety-related regulatory and industry processes by revolutionising data capture, management and sharing. NanoCommons will achieve this through:

- integration of disparate datasets, tools and modelling approaches, where possible, from across the 60+ projects related to nanosafety-funded across FP6, FP7 and H2020 (NA),
- development of an integrated Knowledgebase to facilitate development and application of regulatory tools such as QSARs, grouping and read-across (JRA); and
- efforts to support Users (all stakeholders: academia, industry, regulators) in their utilisation of the appropriate tools and supporting expertise to address their data and research needs (TA).

The impact of NanoCommons expands not only within scientific research, but also in policy, commercial and socioeconomic aspects (Figure 6). This is achieved by promoting data driven innovation in combination with high quality data FAIRness that will result in higher return on investment from the publicly funded EU projects, while promoting safer nano-containing products.



**Figure 6 NanoCommons impact in terms of policy, economic and societal benefits arising from the project.**



The services and tools offered by NanoCommons are based on the expertise of its partners distributed across the following four main categories:<sup>6</sup>

- Experimental Workflows Design & Implementation: Automated data acquisition, online lab-books, data curation templates, nanoinformatics implementation;
- Data Processing & Analysis: Data cleansing, mining and analysis, modelling, ISA-TAB tools, ontologies;
- Data Visualisation & Predictive Toxicity: Omics, QSARs, modelling and risk assessment tools;
- Online Data Storage & Online Accessibility: Data repositories, data storage and online access.

All tools and services are underpinned by a set of support services including the NanoCommons Helpdesk to support users in determining the most appropriate tool for their needs, and the NanoCommons library of training materials linked to the TA services and the models and tools available (within the WP7: NA5 – Helpdesk for TA).

Based on the survey feedback, NanoCommons needs to offer the community a set of novel data management solutions, that result in:

- A reduction in working hours spent on data curation and data cleaning to make suitable for re-use;
- Cost reduction for users in terms of their tests/analyses by facilitating re-use of existing data, and through provision of validated models and decisions supports lead to a reduced requirement for testing;
- Risk reduction through enhanced access to data and thus reduced assumptions in models and decision tools;
- Continuous accessibility whereby users have much greater access to data, their own and others, via a user-friendly portal that focuses on user experience and enhanced convenience/usability.

The whole research e-infrastructure as described above must also be supported by training materials and community guidance documents, tailored to the needs of the different stakeholder groups, in order to ensure accessibility to Nanosafety data and the range of services and tools built upon the data.

NanoCommons is actively working and is already, or in route of, delivering the following:

- a sustainable and openly accessible nanoinformatics framework (knowledgebase and integrated computational tools, supported by expert advice, data interpretation and training), for assessment of the risks of NMs, their products and their formulations;
- establishment of a single integrated resource for nanosafety data;
- lifting the barriers from Nanosafety-related regulatory & industry processes by revolutionising data capture, management & sharing;

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<sup>6</sup> <https://www.nanocommons.eu/services/>

- reducing regulatory costs through the organisation and visualisation of high-quality openly accessible FAIR data and data relationships, integration of computational tools for risk assessment, decision support, grouping and read-across;
- rich and diverse training content openly accessible to the entire community;
- A sustainable, user friendly e-informatics platform, that is secure and stable, providing reliable performance for users (with maximum online time).

## 4. Survey results and NanoCommons relevant projects and frameworks

Chapter 4 presents the, so far, acquired community feedback as received through the online survey. It also provides a list of the national, EU, non-EU and international projects and programs of relevance to NanoCommons identified through several sources.

### 4.1 Survey results

Table 1 presents the results of the online survey which has been broadly distributed within the project members' community and network. As of May 2019, there have been 61 responses with an average of 6 minutes completion time.

**Table 1: Results of the online survey about services/tools to be offered by NanoCommons**

No.	Question	Response	Total	%	Selected (>40%)
5	Experimental Design Service(s)	Experimental design for nanoinformatics	22	38%	
		Online lab-books, data acquisition	34	59%	*
		Data curation templates	26	45%	*
		I don't know if I need it!	7	12%	
		None of the above	8	14%	
		Other (please specify)	6	10%	
6	Data Processing and Analysis	Data cleansing, mining and analysis	27	47%	*
		Modelling (statistical, mechanistic etc.)	33	57%	*
		ISA-TAB tools	10	17%	
		Ontology services	11	19%	
		I don't know if I need it!	17	29%	
		None of the above	3	5%	
		Other (please specify)	0	0%	
7	Data Visualisation and Predictive Toxicity	Omics	10	17%	
		Risk assessment tools	29	50%	*
		QSARs	15	26%	
		Modelling tools	33	57%	*
		I don't know if I need it!	9	16%	
		None of the above	4	7%	
		Other (please specify)	0	0%	
8	Data Storage	Software development	19	33%	
		Tool(s) integration	23	40%	*
		Online data repository and accessibility	32	55%	*
		Data storage (hardware)	21	36%	
		I don't know if I need it!	13	22%	
		None of the above	3	5%	
		Other (please specify)	0	0%	
9	Using DMP/Tools/QA for the data generated in the project	Currently using some form of DM or QA plans	11	19%	
10	FAIR Principles	Aware of FAIR principles	25	43%	
		Interested in learning more about FAIR	25	43%	*
12	To be contacted by NanoCommons in the future	Interested	42	72%	*

Based on the results presented on Table 1 and the 40% threshold for a service to be implemented in the NanoCommons Knowledgebase, the consortium has concentrated its initial efforts (months 1-18) on the tools and services presented in Table 2. These services and tools are covered by four main categories and are:

1. Experimental design support
  - a. online lab-books for data acquisition
  - b. data curation templates
2. Data processing and analysis

- a. Data cleansing, mining and analysis
  - b. Modelling (statistical, mechanistic, etc.)
3. Data visualisation and predictive toxicity
- a. Risk assessment tools
  - b. Modelling tools
4. Data storage and accessibility
- a. Tool(s) integration
  - b. Online data repository and accessibility
  - c. Data storage (hardware).

**Table 2: Categories of Services and Tools to be offered by the NanoCommons platform**

Experimental Design Service(s)	Online lab-books, data acquisition
	Data curation templates
Data Processing and Analysis	Data cleansing, mining and analysis
	Modelling (statistical, mechanistic, etc.)
Data Visualisation and Predictive Toxicity	Risk assessment tools
	Modelling tools
Data Storage & Online Accessibility	Tool(s) integration
	Online data repository and accessibility
	Data storage (hardware)

Table 3 provides information on the expertise of the NanoCommons partners covering the requested services and tools. During the 2<sup>nd</sup> general Assembly of NanoCommons (8<sup>th</sup>-10<sup>th</sup> October 2018, Athens), a special *Workshop on Services & Tools* was organised (see chapter 6.2 "Annex 2 – NanoCommons Workshop Athens - Agenda" for more details). Each partner was given the opportunity to present the services they were able to offer. Table 4 provides a cross-reference of partners' expertise with the four main categories of the offered services and tools demonstrating the dynamic and diverse set of skills of the NanoCommons consortium.

**Table 3: NanoCommons experts offering services/tools**

Question Text	Response	%	Services/tools offered by NanoCommons – Partners' expertise														
			UoB	DC	NERC	NTUA	UCD	LEITAT	BfR	BNN	PLUS	Novamech	Biomax	UM	Duke	Oregon	
Experimental Design Service(s)	Online lab-books, data acquisition	67%	x	x	x				x	x						x	
	Data curation templates	48%	x		x				x	x						x	
Data Processing and Analysis	Data cleansing, mining and analysis	43%	x														
	Modelling (statistical, mechanistic etc.)	62%	x			x											
Data Visualisation and Predictive Toxicity	Risk assessment tools	48%															
	Modelling tools	71%				x											
Data Storage	Tool(s) integration	48%															
	Online data repository and accessibility	67%															x
	Data storage (hardware)	48%	x														
FAIR principles	Interested in learning more about FAIR	57%	x									x			x		

**Table 4: Services and Tools offered by NanoCommons' project partners sorted by the 4 categories of services**

Project Partner	Tools/Services offered by NanoCommons - Partners Expertise			
	Experimental Workflows	Data Processing & Analysis	Data Visualisation & Predictive Toxicity	Online Data Storage
UoB	x	x	x	x
DC		x		
NERC	x	x		
NovaMechanics		x		
Biomax		x		
NTUA		x		
UM		x		
CEINT				
BNN				
PLUS				
Oregon				
LEITAT	x			
UCD				x
BfR		x		x

## 4.2 EU and nationally funded projects relevant to NanoCommons

The WP10 TF in collaboration with the entire NanoCommons consortium was able to identify a large number of relevant completed and ongoing EU and non-EU (Table 5) and nationally (Table 6) funded projects (in EU and non-EU countries) that could benefit from the NanoCommons tools and services. The results originate from online resources (e.g. CORDIS, national databases), official bodies (e.g. Nanosafety Cluster) and personal contacts. These projects cover all aspects of nanomaterials and nanosafety research and could potentially add significant data to the NanoCommons data warehouse and the entire community. Thus,

NanoCommons is planning to try and get in touch with as many projects as possible and offer to add value to their experimental and computational results and integrate potential data and tools developed. The interaction with these projects will also assist with the Sustainability Plan of NanoCommons and the requirements of the EC for FAIR and Open data.

**Table 5: EU and non-EU funded projects relevant to NanoCommons**

Acronym	Coordinator (Org.)	Country	NC Contact (Org.)	Project Status
2D-INK	POLYMAT - University of Basque Country	Spain		Ongoing
ACEnano	University of Birmingham (UoB)	United Kingdom	UoB DC UKRI	Ongoing
ATLASS	Merck Chemicals Ltd.	United Kingdom		Ongoing
BASMATI	Umicore	Belgium	LEITAT	Completed
BIOGO-for-Production	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.	Germany		Completed
caLIBRAte	National Research Centre for the Working Environment	Denmark		Ongoing
CASCATBEL	Fundación IMDEA Energía	Spain		Completed
CERASAFE	Institute of Environmental Assessment and Water Research (IDAEA - CSIC)	Spain		Completed
CIRCLE	Waterford Institute of Technology	Ireland		Completed
CO-PILOT	Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek (TNO)	Netherlands		Completed
DIACAT	Julius-Maximilians-Universität Würzburg	Germany		Ongoing
DIMAP	Profactor GmbH	Austria	BNN	Completed
EC4SafeNano	INERIS	France	UoB	Ongoing
EELICON	Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V.	Germany		Completed
eNanoMapper	Douglas Connect	Switzerland	DC NTUA	Completed
FAST	Fundación Tecnalia Research & Innovation University Maastricht	Spain Netherlands	UM	Ongoing
FASTCARD	SINTEF (Stiftelsen for industriell og teknisk forskning)	Norway		Completed

FLEXPOL	Fraunhofer Institute for Production Technology IPT	Germany		Ongoing
FOLSMART	Associacao Universidade Empresa para Desenvolvimento Tecminho	Portugal		Ongoing
Gov4Nano	Netherlands National Institute for Public Health and the Environment (RIVM)	Netherlands	BNN	Grant preparation
GRACIOUS	Heriot-Watt University	United Kingdom	LEITAT Duke Uni BfR	Ongoing
Graphene (Graphene Flagship)	Chalmers University of Technology	Sweden	UCD	Ongoing
GREENSENSE	LEITAT - Acondicionamieto Terrasense Associacion	Spain	LEITAT	Ongoing
Hi-RESPONSE	Precision Varionic International Limited	United Kingdom	BNN	Ongoing
HISENTS	University of Leeds	United Kingdom		Ongoing
HoliFAB	Fluigent Smart Microfluidics	France		Ongoing
INNPAPER	Fundacion CIDETEC	Spain		Ongoing
INSPIRED	Joanneum Research Forschungsgesellschaft mbH	Austria	BNN	Ongoing
INTEGRAL	Commissariat à l'Énergie Atomique et aux Énergies Alternatives - CEA LITEN	France		Ongoing
IZADI-NANO2INDUSTRY	Fundación Tecnalia Research & Innovation	Spain		Completed
LiNaBioFluid	Foundation for Research and Technology - Hellas	Greece		Completed
Lorcenis	SINTEF (Stiftelsen for industriell og teknisk forskning)	Norway	NTUA	Ongoing
M3DLoC	National Technical University of Athens (NTUA)	Greece	NTUA	Ongoing
MACIVIVA	Mymetics BV	Netherlands		Completed
MAGicSky	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)	France		Completed
MIDES	FCC Aqualia S.A.	Spain	LEITAT	Ongoing
ModCOMP	NTUA (National Technology University Athens)	Greece	NTUA	Ongoing
MOZART	Politecnico di Torino	Italy		Ongoing
NANOFACTURING	Midatech Pharma España S.L.	Spain		Ongoing

## D10.2 Interaction Needs and Goals of Nano Safety Projects and Programs

NanoFARM	Universidade de Aveiro	Portugal		Ongoing
NanoFASE	CEH / NERC	United Kingdom	NERC	Ongoing
NanoFATE	CEH / NERC	United Kingdom	NERC	Completed
NanoGenTools	Universidad de Burgos (UBU)	Spain	UoB	Ongoing
NanoGRAVUR	Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA)	Germany	BfR	Completed
NanoHybrids	Technische Universität Hamburg (TUHH)	Germany		Ongoing
NanoInformaTIX	CSIC	Spain		Grant preparation
NANOLEAP	Universidad de Castilla La Mancha	Spain		Completed
NanoMILE	University of Birmingham (UoB)	United Kingdom	UoB	Completed
NanoPack	Technion - Israel Institute of Technology	Israel		Ongoing
NanoPilot	IK4-CIDETEC	Spain		Ongoing
NanoPolyTox	LEITAT	Spain	LEITAT	Completed
NaNoREG	Ministerie van Infrastructuur en Waterstaat	Netherlands	LEITAT BfR	Completed
NanoReg2	INERIS - Institut National de l'Environnement et des Risques	France	BfR	Completed
NanoReTox	University of Birmingham (UoB)	United Kingdom	UoB	Completed
NANORIGO	ENAS	Denmark		Grant preparation
NanoSmell	Weizmann Institut of Science	Israel		Ongoing
NanoSolutions	Finnish Institute of Occupational Health (FIOH) (Työterveyslaitos)	Finland	LEITAT UCD	Completed
NanoSolveIT	NovaMechanics	Cyprus	Novamechanics	Grant preparation
NanoStreeM	Imec - Interuniversitair Micro-Electronica Centrum	Belgium	UCD	Ongoing
NanoTextSurf	VTT Technical Research Centre of Finland Ltd	Finland		Ongoing
NANOTUN3D	Metal-Processing Technology, Wood, Furniture and Packaging Institute (AIDIMME)	Spain		Ongoing
NECOMADA	Centre for Process Innovation (Formulation & Printable Electronics)	United Kingdom		Ongoing
npSCOPE	Luxembourg Institute of Science and Technology (LIST)	Luxemburg		Ongoing



OpenRiskNet	Douglas Connect (DC)	Switzerland	DC	Ongoing
OptiNanoPro	Iris Technology Solutions S.L.	Spain		Completed
Pandora	Information Institute of Protein Biochemistry	Italy	PLUS	Ongoing
PATROLS	Swansea University	United Kingdom	UKRI	Ongoing
PEPTICAPS	Fundacion CideteC	Spain		Completed
POROUS4APP	Acondicionamiento Tarrasense Associacion (LEITAT)	Spain	LEITAT	Ongoing
PROCETS	Ethinko Kentro Ervnas Kai Technologikis Anaptyxis	Greece		Ongoing (June 2019)
ProDIA	SINTEF AS	Norway		Completed
ProSafe	Ministerie van Infrastructuur en Watersaat	Netherlands		Completed
PROTECT	Univertitat Politecnica de Catalunya (EUETIT)	Spain		
R2R Biofluidics	Joanneum Research Forschungsgesellschaft MBH	Austria	BNN	Ongoing (July 2019)
RiskGONE	NILU	Norway		Grant preparation
Serenade - CEREGE (NIKC Partner)	CEREGE (NIKC Partner) ??	France		Completed
SHYMAN	The University of Nottingham	UK		Completed
SKHINCAP	Centre for Nanotechnology and Smart Materials (CeNTI)	Portugal		Ongoing
SKHINCAPS	Centro de Nanotecnologia E Materiais TecnicosFuncionais E inteligentes Associacao (CENTITVC)	Portugal		Ongoing
SmartNanoTox	University College Dublin (UCD)	Ireland	UCD	Ongoing
SMARTONICS	Aristoteilo Panepistimo Thessalonikis	Greece		Completed
ULTRAQCL	Centre National de la Recherche Scientifique (CNRS)	France		Completed (March 2019)
UPCON	University of Regensburg	Germany		Completed
ZOTERAC	Centre National de la Recherche Scientifique (CNRS)	France		Ongoing

**Table 6: List of national funded projects (in EU and non-EU countries)**

#	National Project Name / Acronym	Status	Relevant Nanosafety aspect	Project Coordinator [Company/Organization]	Country
1	<b>NanoProdEx</b> (Nanoproducts – Identification and Exposure)	Completed	Analysis of NM in consumer goods	BioNanoNet Forschungsgesellschaft mbH	Austria
2	<b>SbD-AT</b> (Safe-by-Design Relevanz und Mehrwert für österreichische Unternehmen)	Completed	Support the safe development of nanomaterials	Brimatech Services GmbH	Austria

3	<b>SWOT SbD</b> (Stärke- /Schwächeanalyse "Safe-by-Design")	Completed	To collect and assess the extent to which the SbD concept is suitable, to ensure the development of safe nanomaterials and nanoproducts in the manufacturing industry.	AIT Austrian Institute of Technology GmbH	Austria
4	<b>SafeNanoKap</b> (Anwendbarkeit des SAFE-by-Design-Konzeptes am Beispiel der Produktentwicklung von NANOMaterialien in KaffeeKAPseln)	Completed	Identification and minimization of potential and unexpected risks at the life cycle of coffee capsules by application of the SbD concept.	<a href="#">Universität für Bodenkultur Wien Institut für Abfallwirtschaft (BOKU)</a>	Austria
5	<b>NanoAdd</b> (Die Bedeutung von funktionellen Füllstoffen und nanoskaligen Additiven für Kunststoffe in der Kreislaufwirtschaft)	Ongoing	Detailed examination of the importance of functional fillers and nanoscale additives for plastics in the circular economy	<a href="#">Universität für Bodenkultur Wien Institut für Abfallwirtschaft (BOKU)</a>	Austria
6	NAN-O-STYLE <b>NANOTECHNOLOGIE</b> ↔ MODERN LIFESTYLE	Ongoing	Nanomaterials are investigated in complex matrices, i.e. consumer products used by young people.	University of Salzburg, Allergy Cancer BioNano Research Centre, ACBN	Austria
7	<b>ICA</b> Immunity in Cancer & Allergy	Ongoing	The effect of nanoparticles on dendritic cells is investigated within the ICA. Contamination by endotoxin is a major issue in this context.	University of Salzburg, Allergy Cancer BioNano Research Centre, ACBN	Austria
8	<b>EnalosGPU</b>	Completed	GPU Algorithms	NovaMechanics	Cyprus
9	<b>VIP-MeDiCinA</b>	Completed	Drug delivery with nanoparticles	NovaMechanics	Cyprus
10	<b>DaNa 2.0</b>	Ongoing	Data and knowledge on Nanomaterials - Processing of socially relevant scientific facts	DECHEMA e.V.	Germany
11	<b>CaNTser</b>	Ongoing	Investigating the toxic potential of carbon nanotubes after long-term inhalation	Fraunhofer-Institute for Toxicology and Experimental Medicine (ITEM), Hannover (DE)	Germany

12	<b>ProCycle</b>	Completed	Analysis and toxicological evaluation of dusts from recycling and recycling processes of nanocomposites and strategies for risk minimisation	Fraunhofer Institute for Chemical Technology (ICT), Pfinztal (DE)	Germany
13	<b>DENANA</b>	Completed	Design criteria for sustainable nanomaterials	University of Bremen	Germany
14	<b>InhalT-90</b>	Completed	InhalT-90: 90 days inhalation testing with CeO <sub>2</sub> in the rat and subsequent analysis of gene expression profiles for the early detection of toxic / carcinogenic effects	Fraunhofer Institute for Toxicology and Experimental Medicine (ITEM)	Germany
15	<b>NanoBEL</b>	Completed	Biological Elimination of Complex Diagnostic Nanoparticles	Chemicell GmbH, Berlin (DE)	Germany
16	<b>NanoBioDetect</b>	Completed	Nanoparticles in the tissue: detection, quantification and presentation of biological effect markers	TU Braunschweig, Institute of Semiconductor Technology	Germany
17	<b>nanoCOLT</b>	Completed	Long-term effect of modified carbon black nanoparticles on healthy and damaged lungs	Philipps-University of Marburg, Marburg (DE)	Germany
18	<b>nanoGRAVUR</b>	Completed	nanostructured materials – grouping for occupational health, consumer and environmental protection and risk mitigation	Institute of Energy and Environmental Technology e.V. (IUTA), Duisburg (DE)	Germany
19	<b>Nanomobil</b>	Completed	Synthetic Silver Nanoparticles in the system Soil-Groundwater - mobility, effects on cohabitation and interaction between hydro-, pedo- and biosphere	Department of Engineering Geology and Hydrogeology (LIH), RWTH Aachen	Germany

20	<b>NanoSuppe</b>	Completed	Behaviour of engineered nanoparticles in the pathway wastewater - sewage sludge - plant using the examples TiO <sub>2</sub> , CeO <sub>2</sub> , MWCNT and quantum dots	Helmholtz Centre Dresden-Rossendorf (HZDR)	Germany
21	<b>NanoUmwelt</b>	Completed	Risk analysis of engineered nanomaterials in the environment: identification, quantification and analysis of the human- and ecotoxicological effects	Postnova Analytics GmbH, Landsberg am Lech (DE)	Germany
22	<b>CarbonBlack</b>	Completed	Prediction of the human-toxicological effect of synthetic carbon black nanoparticles	Research Centre Borstel, Leibniz-Center for Medicine and Biosciences, Borstel (DE)	Germany
23	<b>CarboTox</b>	Completed	Development of screening methods to analyse cancerogenous potential of carbon nanotubes	Fraunhofer-Institute for Toxicology and Experimental Medicine (ITEM), Hannover (DE)	Germany
24	<b>NanoExpo</b>	Completed	Nanobalance detectors for individual-related measurements of nanoparticle exposures	TU Braunschweig, Institute of Semiconductor Technology	Germany
25	<b>nanoGem</b>	Completed	Nanostructured Materials - health, exposure and material properties	Institute of Energy and Environmental Technology e.V. (IUTA), Duisburg (DE)	Germany
26	<b>NanoKon</b>	Completed	Systematic evaluation of health effects of nanoscale contrast agents	Sarastro GmbH	Germany
27	<b>NanoMed</b>	Completed	Toxicological characterisation of nanomaterials for the diagnostic imaging in medicine	Chemicell GmbH	Germany
28	<b>Nanosilver particles</b>	Completed	Mechanisms of action and investigation of their possible interaction with tissues, cells and molecules. Definition of their relevant	aap Biomaterials GmbH	Germany

			potential for intolerance		
29	<b>NanoPole : Development of Novel Electrochemical Processes for Water Treatment Applications Using Composite Electrodes based on Nanocarbon Materials and Conductive Polymers</b>	Ongoing	Synthesis of carbon nanomaterials: Carbon nanotubes, carbon nanofibers, graphene nanoplatelets, graphene oxide à different synthesis processes. Functionalization of carbon-based nanostructures	CERTH/CPERI: Centre for Research and technology Hellas / Chemical Process and Energy Resources Institute	Greece
30	<b>HEAT</b>	Completed	Nanomaterials, NPs, CNTs, GO	ISAAR: Institute of Structural Analysis and Antiseismic Research at National Technical University of Athens	Greece
31	<b>Bio-Interface: Quantitative Modelling of Bionano Interface</b>	Ongoing	Nanomaterial safety, Nanomaterial functionality, Nanoinformatics,	University College Dublin	Ireland
32	<b>NanoNextNL</b>	Completed		NanoNextNL Foundation	Netherlands
33	<b>NanoNextNL - 1A Human health risks</b>	Completed		Wageningen UR	Netherlands
34	<b>NanoNextNL - 1B Environmental risks</b>	Completed	Ecotoxicology	KWR Water B.V.	Netherlands
34	<b>NextNextNL - 1C Technology assessment</b>	Completed		Maastricht University	Netherlands
35	<b>Development of Quantitative Nanostructure Activity Relationship (QNAR) Models Predicting the Toxicity of Metal-based Nanoparticles to Aquatic Species</b>	Completed		Leiden University	Netherlands
35	<b>De Quantum en Nano Revolutie - Nanomedicine</b>			TU Delft	Netherlands

36	<b>Nano4Derm</b>	Ongoing	Nanomedicine applied to treat dermatological diseases: New innovative formulations containing nanoencapsulated active ingredients will be developed for the topical treatment of inflammatory skin conditions, such as Acne and Psoriasis.	Almirall	Spain
37	<b>A study of the effects of silver surface chemistry on bactericidal properties of silver nanoparticles</b>	Completed	Ecotoxicology, Bioavailability, Risk assessment	The University of Manchester, Chemistry	United Kingdom
38	<b>An investigation into the effects of nanoparticles on the bacterial diversity of freshwater and coastal marine sediments</b>	Completed	Ecotoxicology, freshwater/marine	Plymouth Marine Laboratory, Plymouth Marine Lab	United Kingdom
39	<b>Biomembrane interactions in the toxicology of nanoparticles to microorganisms</b>	Completed	Toxicity, toxicology	University of Leeds, Centre for Molecular Nanoscience	United Kingdom
40	<b>Consortium for Manufactured Nanomaterial Bioavailability &amp; Environmental Exposure (or nanoBEE)</b>	Completed	Fate and bioavailability	Heriot-Watt University, Sch of Life Sciences	United Kingdom
41	<b>Dietary Exposure to Nanoparticles in Fish: A Pilot Study</b>	Completed	Bioavailability and toxicity	University of Plymouth, Biological Sciences	United Kingdom
42	<b>Effects of C-60 fullerenes and carbon nanotubes on marine mussels.</b>	Completed	Pollution and Waste, Environmental Risks and Hazards Toxicology	Plymouth Marine Laboratory, Plymouth Marine Lab	United Kingdom
43	<b>Genomic and oxidation-related biological responses in fish exposed to fullerenes of different physicochemical characteristics</b>	Completed	Pollution, Ecotoxicology, Environmental Genomics, Environment & Health	University of Birmingham, Sch of Biosciences	United Kingdom

44	<b>Impact and recovery of groundwater microbial communities exposed to manufactured nanomaterials (MNM)</b>	Completed	Environmental Microbiology, Ecotoxicology, Environmental Physiology, Environmental biotechnology, Pollution, Waste & Resources	University of Oxford, Begbroke Directorate	United Kingdom
45	<b>Impact of manufactured nanoparticles on the catabolic capabilities and phenotypic structure of soil microbial communities</b>	Completed	Environmental Microbiology, Pollution, Ecotoxicology, Soil science	Cranfield University, Sch of Applied Sciences	United Kingdom
46	<b>Interaction of Nanoparticles with Microbial Populations during Particle Transport</b>	Completed	Earth Surface Processes, Environmental Physiology, Biogeochemical Cycles, Soil science	University of Sheffield, Kroto Research Institute	United Kingdom
47	<b>Manufactured Nanoparticle Migration in Groundwaters</b>	Completed	Water Quality Hydrogeology	University of Birmingham, Sch of Geography, Earth & Env Sciences	United Kingdom
48	<b>Model nanoparticles for environmental risk studies</b>	Completed	Water Quality, Pollution, Ecotoxicology, Environment & Health Risk assessment	The Natural History Museum, Mineralogy	United Kingdom
49	<b>Environmental Sampling for Nanosafety Testing</b>	Completed	Safety in the workplace and risk assessment	Avanticell Science Limited	United Kingdom
50	<b>Nanosafety Screening using Immune Cells from a Sentinel Species</b>	Completed	Ecotoxicity	Avanticell Science Limited	United Kingdom
51	<b>Tracking relevant nanomaterial transformations, exposure, uptake and effects in freshwater and soil systems</b>	Ongoing	Pollution, waste & resources	NERC CEH	United Kingdom
52	<b>Single particle ICP-MS applications in nanomaterial safety</b>	Ongoing	Method development	UoB	United Kingdom

53	<b>Tracking relevant nanomaterial transformations, exposure, uptake and effects in freshwater and soil systems</b>	Ongoing	Pollution, waste & resources	University of Exeter	United Kingdom
54	<b>Tracking relevant nanomaterial transformations, exposure, uptake and effects in freshwater and soil systems</b>	Ongoing	Pollution, waste & resources	UoB	United Kingdom
55	<b>Demonstrator Component of Nanomaterials Characterisation</b>	Completed	Instrumentation	Naneum Limited	United Kingdom
56	<b>Analysing Nanomaterials in Complex Environments</b>	Ongoing	Characterisation	University of Leeds	United Kingdom
57	<b>Multimodal characterisation of nanomaterials in the environment</b>	Ongoing	Pollution, waste & resources	Imperial College	United Kingdom
58	<b>Stable isotope tracing of nanomaterials in plants</b>	Ongoing	Risk assessment	Imperial College	United Kingdom
59	<b>Multimodal characterisation of nanomaterials in the environment</b>	Ongoing	Pollution, waste & resources	University of Bristol	United Kingdom
60	<b>Pathway analysis in characterising the toxicological properties of nanomaterials</b>	Completed	Toxicology	Imperial College	United Kingdom
62	<b>PROSPeCT: Ecotoxicology test protocols for representative nanomaterials in support of the OECD sponsorship programme</b>	Completed	Ecotoxicity	University of Exeter	United Kingdom
62	<b>Assessment of the potential hazards of 2D nanomaterials to the environment</b>	Ongoing	Hazard assessment	Imperial College	United Kingdom



65	<b>PROSPEC:</b> Ecotoxicology test protocols for representative nanomaterials in support of the OECD sponsorship programme	Completed	Ecotoxicity	Imperial College	United Kingdom
66	<b>Assessing the Environmental Costs and Benefits of Resource Recovery Approaches for Nanomaterials in Future Waste Streams</b>	Completed	Pollution	University of York	United Kingdom
67	<b>Metal/Metal Oxide Nanomaterials and Oxidative Stress- Are there Harmful Health Effects in Fish for Environmental Exposures?</b>	Completed	Pollution, waste & resources	University of Exeter	United Kingdom
68	<b>Metal/Metal Oxide Nanomaterials and Oxidative Stress- Are there Harmful Health Effects in Fish for Environmental Exposures?</b>	Completed	Pollution, waste & resources	Imperial College	United Kingdom
69	<b>Metal/Metal Oxide Nanomaterials and Oxidative Stress- Are there Harmful Health Effects in Fish for Environmental Exposures?</b>	Completed	Toxicology	UoB	United Kingdom
71	<b>The radical nature of oxidative stress triggered by metal nanoparticles</b>	Completed	Toxicology	University of York	United Kingdom
72	<b>Visualisation of Nanoparticles in the Environment</b>	Completed	Fate	Lancaster University	United Kingdom
73	<b>Beyond Biorecovery: environmental win-win by biorefining of metallic wastes into new functional materials (B3)</b>	Completed	Pollution, waste & resources	University of Exeter	United Kingdom

74	<b>Beyond Biorecovery: environmental win-win by biorefining of metallic wastes into new functional materials (B3)</b>	Ongoing	Pollution, waste & resources	UoB	United Kingdom
75	<b>Beyond Biorecovery: environmental win-win by biorefining of metallic wastes into new functional materials (B3)</b>	Ongoing	Pollution, waste & resources	Bangor University	United Kingdom
76	<b>Use of transgenic zebrafish as a tool to study nanomaterial inflammogenicity</b>	Ongoing	Toxicology	Heriot-Watt University	United Kingdom
78	<b>Novel Detection of Engineered Nanoparticles in Workplaces</b>	Completed	Hazard assessment	Naneum Limited	United Kingdom
81	<b>Fate, reactivity and environmental impact of using iron nanoparticles for site clean-up</b>	Completed	Fate assessment	University of Bristol	United Kingdom
83	<b>Distinguishing realistic environmental risks of nanoplastics by investigating fate and toxicology in real-world scenarios</b>	Ongoing	Risk assessment	Heriot-Watt University	United Kingdom
84	<b>Distinguishing realistic environmental risks of nanoplastics by investigating fate and toxicology in real-world scenarios</b>	Ongoing	Risk assessment	University of Plymouth	United Kingdom
85	<b>Manufactured nanoparticle bioavailability and environmental exposure (nanoBEE)</b>	Completed	Environmental Assessment	UoB	United Kingdom
86	<b>Manufactured nanoparticle bioavailability and environmental exposure (nanoBEE)</b>	Completed	Environmental Assessment	University of Exeter	United Kingdom

87	<b>Manufactured nanoparticle bioavailability and environmental exposure (nanoBEE)</b>	Completed	Environmental Assessment	Natural History Museum	United Kingdom
88	<b>Understanding the Genotoxic Potential of Ultra-Fine Superparamagnetic Iron Oxide Nanoparticles</b>	Completed	Genotoxicity	Swansea University	United Kingdom
89	<b>Hazards of nanoparticles to the environment and human health</b>	Completed	Hazard assessment	Natural History Museum	United Kingdom
90	<b>Transatlantic Initiative for Nanotechnology and the Environment</b>	Completed	Exposure and fate assessment	Rothamsted Research	United Kingdom
91	<b>Transatlantic Initiative for Nanotechnology and the Environment</b>	Completed	Exposure and fate assessment	Cranfield University	United Kingdom
92	<b>Transatlantic Initiative for Nanotechnology and the Environment - A new robust insitu tool for measuring nanoparticles and assessing their effects</b>	Completed	Exposure and fate assessment	Lancaster University	United Kingdom
93	<b>[WATER]Quantifying base-line titanium oxide manufactured nanoparticle concentrations in the aquatic environment</b>	Completed	Fate assessment	UoB	United Kingdom
94	<b>Tracking relevant nanomaterial transformations, exposure, uptake and effects in freshwater and soil systems</b>	Completed	Pollution, waste & resources	UoB	United Kingdom
95	<b>Tracking relevant nanomaterial transformations, exposure, uptake and effects in freshwater and soil systems</b>	Ongoing	Ecotoxicity	NERC CEH	United Kingdom
96	<b>Tracking relevant nanomaterial transformations, exposure, uptake and effects in freshwater and soil systems</b>	Ongoing	Exposure and fate assessment	University of Exeter	United Kingdom

97	<b>Nanoscale zerovalent iron (nZVI) impact on soil microbial communities</b>	Completed	Pollution, Ecotoxicology, Technol. for Environ. Appl., Soil science	University of Reading, Geography and Environmental Sciences	United Kingdom
98	<b>Pharmaceutical and cosmetic silica nanoparticles: towards an understanding of their structure, fate and behaviour in aquatic systems</b>	Completed	Water Quality Environment & Health	King's College London, Pharmaceutical Sciences	United Kingdom
99	<b>Risk Assessment for Manufactured Nanoparticles Used in Consumer Products (RAMNUC)</b>	Completed	Pollution Ecotoxicology Environment & Health	Imperial College London, National Heart and Lung Institute	United Kingdom
100	<b>Synthetic polymer nanoparticles: effects of composition and size on uptake, toxicity and interactions with environmental contaminants</b>	Completed	Pollution Ecotoxicology	University of East Anglia, Environmental Sciences	United Kingdom
101	<b>TINE (Transatlantic Initiative for Nanotechnology and the Environment)</b>	Completed	Water Quality Pollution Ecotoxicology Soil science	NERC Centre for Ecology & Hydrology	United Kingdom
102	<b>Understanding the fate and behaviour of manufactured nanoparticles in natural waters</b>	Completed	Water Quality Pollution	University of Birmingham, Sch of Geography, Earth & Env Sciences	United Kingdom
103	<b>Nanoparticle immunotoxicity using an environmental sentinel as a model</b>	Completed	Ecotoxicology Soil science	NERC Centre for Ecology & Hydrology	United Kingdom
104	<b>Environmental Nanoscience Initiative (ENI) Knowledge Exchange Fellowship</b>	Completed	Waste Management Waste Pollution Management Assess/Remediate Contamination Contamination Risk Assessment Materials Synthesis & Growth Ecotoxicology	Cranfield University, School of Water, Energy and Environment	United Kingdom

105	<b>The CEINT</b> (Center for Environmental Implications of NanoTechnology) <b>NIKC</b> (NanoInformatics Knowledge Commons)	Ongoing	Elucidate the general principles that determine nanomaterial behaviour in the environment; 2) identify metadata necessary to predict exposure potential and bio-uptake; and 3) identify key characterization assays that predict outcomes of interest.	Duke University	USA
106	<b>The CEINT</b> (Center for Environmental Implications of NanoTechnology) <b>NanoPHEAT</b> (Nano Product Hazard and Exposure Assessment Tool)	Ongoing	Evaluating risks of exposure to nanomaterials release from consumer products	Duke University	USA
107	Disease-Induced Modification in Nanoparticle-Corona Identity and Toxicity	Ongoing	Evaluating whether underlying disease conditions that affect serum composition alter nanomaterial uptake and toxicity	Purdue University	USA
108	<b>NANOART</b> : Manufacture, delivery and pharmacokinetics for optimizing drug adherence	Ongoing	Nanomaterial delivery, pharmacokinetics	University of Nebraska Medical Center	USA
109	<b>Centre for Sustainable Nanotechnology</b>	Ongoing	Fundamental studies of the specific molecular interactions expected to occur when the surfaces of engineered nanoparticles come into contact with biological interfaces and components	University of Wisconsin-Madison	USA

### 4.3 EU and national funding programs relevant to NanoCommons

Besides the identified projects, the NanoCommons consortium have mapped EU and national funding bodies that will be continuously monitored for new projects that could benefit from and/or add value to the NanoCommons Knowledgebase. WP10 will try to get in touch with newly starting projects in order to establish a collaboration with them from the early stages of the projects' lifetime, thereby ensuring that best practice in nanosafety data management is embedded into these projects from the outset. A webinar / workshop series targeting the

funding bodies in each partner country will be organised in 2020 to further highlight NanoCommons services of relevant to funders and their funded projects. The identified funding programs are listed below in the Table 7.

**Table 7: List of funding programs / agencies (in EU and non-EU countries)**

#	Name of National Funding Program	Name of National Funding Agency	Target area	Country
1	ERA-NET scheme * Country dependent * Different programs	European Commission (EU)	Transnational	Europe
2	EUREKA	EUREKA Association (ESE)	Transnational	Europe
	EU FP7	European Commission (EU)	Transnational	Europe
3	EU H2020	European Commission (EU)	Transnational	Europe
4	COST	European Commission (EU)	Transnational	Europe
5	Interreg (15 Transnational Cooperation Programs): * Alpin Space * Adrion * Atlantic Area * North-West Europe * SUDOE * ...	European Regional Development Fund (ERDF)	Transnational	Europe
6	COMET – Competence Centers for Excellent Technologies 3 programm lines: 1. COMET Centre - K1 2. COMET Centre - K2 3. COMET Project (formerly “K-project”) 4. COMET Module	Österreichische Forschungsförderungsgesellschaft mbH (FFG)	National	Austria
7	General Programme - BRIDGE - the Programme	Österreichische Forschungsförderungsgesellschaft mbH (FFG)	National	Austria
8	ICT of the Future	Österreichische Forschungsförderungsgesellschaft mbH (FFG)	National	Austria

9	NANO EHS - Nano Health Security and Environment (in German only)	Österreichische Forschungsförderungsgesellschaft mbH (FFG)	National	Austria
10	Production of the Future	Österreichische Forschungsförderungsgesellschaft mbH (FFG)	National	Austria
11	Research Studios Austria	Österreichische Forschungsförderungsgesellschaft mbH (FFG)	National	Austria
12	Talents * Young talents * Female talents * Research Projects (*): FEMtech Research Projects * Professional talents * ...	Österreichische Forschungsförderungsgesellschaft mbH (FFG)	National	Austria
13	Exploring New Frontiers - Funding of top-quality Research	Fonds zur Förderung der wissenschaftlichen Forschung (FWF)	National	Austria
14	Cultivating Talents - Development of Human Resources	Fonds zur Förderung der wissenschaftlichen Forschung (FWF)	National	Austria
15	Realizing Ideas - Interactive Effects Science - Society	Fonds zur Förderung der wissenschaftlichen Forschung (FWF)	National	Austria
16	RESTART 2016-2020 A multi-annual development framework of Programmes for the support of Research, Technological Development and Innovation in Cyprus, co-funded by national and European resources, implemented in conjunction with other national initiatives.	Cyprus Research Promotion Foundation	National	Cyprus
17	Nanocare 4.0	Federal Ministry of Education and Research (BMBF)	National	Germany
18	NanoCare/NanoNature (2009-2014)	Federal Ministry of Education and Research (BMBF)	National	Germany

19	Operational Programme Competitiveness, Entrepreneurship and Innovation 2014-2020 (EPAnEK)	Ministry of Economy and Development, Managing Authority of the Operational Programme Competitiveness, Entrepreneurship & Innovation (EPAnEK), undertakes managing responsibilities of EPAnEK (2014-2020) and is under the responsibility of Special Secretary for Management of ERDF and CF Sectoral Operational Programmes.	National	Greece
20	SFI Investigators programme	SFI	National	Ireland
21	Innovational Research Incentives Scheme (VENI, VIDI, VICI)	NWO	National	Netherlands
22	Materials NL	NWO	National	Netherlands
23	Dutch National Research Agenda - Research along Routes by Consortia (NWA-ORC)	NWO	National	Netherlands
24	PDI	CDTI - Centro para el desarrollo Tecnológico Industrial	National	Spain
25	CIEN	CDTI - Centro para el desarrollo Tecnológico Industrial	National	Spain
26	Retos Colaboración	Ministerio de Ciencia, Innovación y Universidades	National	Spain
27	Retos Investigación	Ministerio de Ciencia, Innovación y Universidades	National	Spain
28	Proyectos estratégicos de I+D	CDTI - Centro para el desarrollo Tecnológico Industrial	National	Spain
29	Innterconecta	CDTI - Centro para el desarrollo Tecnológico Industrial	National	Spain



30	Nuclis de economia circular	ACCIÓ - Agència per a la Competitivitat de l'Empresa	Regional	Spain
31	Generalitat de Catalunya	Agency for Management of University and Research Grants (AGUAR)	Regional	Spain
32	Generalitat de Catalunya	Department de salut	Regional	Spain
33	UK Research and Innovation	Biotechnology and Biological Sciences Research Council (BBSRC)	National	United Kingdom
34	UK Research and Innovation	Engineering and Physical Sciences Research Council (EPSRC)	National	United Kingdom
35	UK Research and Innovation	Innovate UK	National	United Kingdom
36	UK Research and Innovation	Medical Research Council (MRC)	National	United Kingdom
37	UK Research and Innovation	National Center for the Replacement Refinement & Reduction of Animals in Research (NC3RS)	National	United Kingdom
38	UK Research and Innovation	Natural Environment Research Council (NERC)	National	United Kingdom
39	UK Research and Innovation	Science & Technology Facilities Council (STFC)	National	United Kingdom
40	Environmental Nanoscience Initiative	Natural Environment Research Council (NERC)	National	United Kingdom
41	Highlight Topics	Natural Environment Research Council (NERC)	National	United Kingdom
42	Measurement Science and Engineering (MSE) Research Grant Programs	DOC-NIST	National	USA
43	NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research	DOD-ONR-NRL	National	USA
44	Research Interests of the Air Force Office of Scientific Research	DOD-AFOSR	National	USA

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45	Army Research Office Broad Agency Announcement for Fundamental Research	DOD-AMC	National	USA
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## 5. Conclusions

This deliverable, and task, focussed on the identification of the tools and services needed by the entire nano-community and how NanoCommons has been able to identify potential stakeholders that would derive value from and add value to the NanoCommons Knowledgebase. Based on the results of the ongoing NanoCommons online survey the consortium is actively working towards integrating or developing the requested tools and establishing collaborations with relevant projects to promote our services and tools. The efforts of the NanoCommons partners will continue to continuously align and adapt the project offerings based on the emerging and changing needs of all stakeholders. As the NanoCommons survey will remain open for the whole project duration, it is highly likely that the needs of the community will change, or the threshold for services implementation will be reduced to meet more specific and/or wider needs.

Taking into consideration the results obtained in this deliverable, the next steps planned for the project are as follow:

- Evaluation of the kinds of interaction possible and preferred with the identified projects, and of the services and tools offered by NanoCommons in which they are interested [beginning 2019, within the scope of the *T10.2 Sustainability Plan* and *WP2 – Community Building*].
- Interaction with the identified projects/programs – a key low-hanging fruit will be work with national projects to enable them to manage their datasets more effectively, and to encourage them to deposit their data in a NanoCommons compatible database.
- Work on concrete needs of some of the identified projects: [activities starting in the beginning of 2019]
  - Development of the services and tools offered by NanoCommons (JRAs) and as they are implemented to offer them as TAs (WP11 – WP20).
  - Industrial Case Studies in Task T10.2 (Sustainability Plan).
- Definition of Case Studies: *Task 9.3* [activities starting in the beginning of 2019].
- Personal interviews and teleconferences will be performed to reach a wider range of stakeholders, to find out about their needs and goals [*Task T10.2 (Sustainability Plan)* (activities starting at the beginning of 2019)].
- New tools/topics/items of work from customers/users, via the rolling calls, announced on the NanoCommons website (*Task 2.3*) [activities starting early 2019].
- Workshops and training events will be organised to teach our users how to best benefit from NanoCommons and how to use the platform on their own (from early 2019 on a rolling basis).
- Further development of the Helpdesk service, to support potential TA users (Task 7.1 – Demonstrator platform).

## 6. Annexes

### 6.1 Annex 1 - Online Survey about the potential Services to be provided by NanoCommons

In order to collect the needs and goals from other projects against which to design the NanoCommons-services tailored to the identified needs of the potential customers/users, the NanoCommons partners prepared a short questionnaire which was distributed electronically (via conference presentations, the NSC newsletter, twitter etc.) to get feedback from potential users/customers of the project and therefore create a platform that will address the needs of all our customers/users.

The Online Survey can be found here: <https://www.surveymonkey.co.uk/r/PK2KXWW>

**Background information about the NanoCommons Project** (included in the survey so users understood what data we were collecting and why)

NanoCommons is driven by the European nanosafety, nanomedicine and emerging materials research and regulatory communities search for a novel infrastructure providing a standardized, reproducible and interoperable way to access all available data, knowledge and analysis and modelling tools that have been adapted and verified as suitable for application to nanomaterials with their myriad challenges even beyond those of chemical risk assessment. The research community spans toxicology and especially predictive toxicology, systems and structural biology, bioinformatics and its subtopics toxicogenomics, cheminformatics, biophysics and computer science, as well as of the EU's chemical manufacturing industries, e.g. pharmaceutical companies, chemical and agrochemical industries and cosmetic industries, and the corresponding regulatory agencies, e.g. the European Medicines Agency (EMA), the European Chemicals Agency (ECHA), the Scientific Committee on Consumer Safety (SCCS), the European Food Safety Authority (EFSA) and the Organization for Economic Cooperation and Development (OECD).

NanoCommons proposes to create an openly accessible e-infrastructure of scientific and cutting edge and managerial excellence provided by a combination of research intensive academic groups and SMEs serving the current and future (unmet) needs of the key research communities and pivotal industrial users and regulators. As such NanoCommons will bring pan-European added value and innovation opportunities, by answering the increasing demands concerning the prediction of safety of existing and new nanoscale materials for health and environmental sustainability. By specifically addressing the health and safety aspects of nanomaterials or other novel and emerging materials (NEMs) and providing solutions to industry and regulatory bottlenecks to commercialisation of nano-enabled products, NanoCommons is poised for enormous impact.

#### Survey Introduction

Read-across approaches, which are currently absent for NMs, in large part as a result of data fragmentation and inaccessibility, would reduce the cost of nanosafety research and regulation dramatically by removing the need for extensive laboratory and animal testing.

The availability of a nanosafety knowledge infrastructure that organises and visualises data and data relationships, makes it accessible, integrates computational tools for risk assessment

and decision support, enables their validation and facilitates the necessary grouping will be a critical factor in reducing regulatory costs.

The H2020 Infrastructures project, NanoCommons, addresses this gap by creating a community framework and infrastructure for reproducible science, and in particular *in silico* workflows for nanomaterials and beyond, by:

- (i) integration and federation of existing NMs characterisation and interaction mechanisms for knowledge, protocols and data (beyond simple toxicity), along with quality assurance criteria and underpinning ontologies
- (ii) compilation, development and expert support of computational tools for mechanistic and statistical modelling, read-across, grouping, safe-by-design and life cycle assessment to the broader user community, and benchmarking of their predictive power; and
- (iii) provision of (remote) access to its KnowledgeBase, modelling toolbox and workflow optimisation and supporting expertise to facilitate commercialisation of nanotechnology-derived products.

Cross-field (academia, industry, regulatory) collaboration and voluntary knowledge exchange is needed to promote nanosafety research and create a successful scientific environment.

The NanoCommons Team invites you to take this short survey, which will be used to inform the current and future needs of the NanoSafety Community.

Thank you for your time.

The NanoCommons Team

### Contents of the survey

1. Full Name
2. Email address
3. Affiliation/Organisation
4. Are you part of any current national or international project?
  - Yes
  - No
  - If yes, please specify which:
5. Which NanoCommons Experimental Design Service(s) would be of interest to you, your Group/Institute or Project you are part of?
  - Experimental design for nanoinformatics
  - Online lab-books, data acquisition
  - Data curation templates
  - I don't know if I need it!
  - None of the above
  - Other (please specify)
6. Which NanoCommons Data Processing and Analysis Service(s) would be of interest to you, your Group/Institute or Project you are part of?
  - Data cleansing, mining and analysis

- Modelling (statistical, mechanistic etc.)
- ISA-TAB tools
- Ontology services
- I don't know if I need it!
- None of the above
- Other (please specify)

7. Which NanoCommons Data Visualisation and Predictive Toxicity Service(s) would be of interest to you, your Group/Institute or Project you are part of?

- Omics
- Risk assessment tools
- QSARs
- Modelling tools
- I don't know if I need it!
- None of the above
- Other (please specify)

8. Which NanoCommons Data Storage Service(s) would be of interest to you, your Group/Institute or Project you are part of?

- Software development
- Tool(s) integration
- Online data repository and accessibility
- Data storage (hardware)
- I don't know if I need it!
- None of the above
- Other (please specify)

9. Are you currently using any data management plan / tools / quality assurance for the data generated by your project?

- Yes
- No
- If yes, please specify which:

10. Are you aware of the FAIR (Findable, Accessible, Interoperable, Reusable) Data principles and what they entail?

- Yes
- No

11. If no, would you be interested to learn more about the FAIR principles?

- Yes
- No

12. Would you like to be contacted, at a later date, by NanoCommons regarding the services you are interested in and/or when user calls are launched?

- Yes
- No

## 6.2 Annex 2 – NanoCommons Workshop Athens - Agenda

During the 2<sup>nd</sup> general Assembly of NanoCommons (8<sup>th</sup>- 9<sup>th</sup> October 2018, Athens), a special *Workshop on Services & Tools* was organized where the different partners identified as experts in the services and tools presented them to the whole consortium in order to make them more comprehensible for all.

The Workshop took place during the second day of the meeting (9<sup>th</sup> October 2018), as shown in the meeting agenda below.



NanoCommons 2nd General Assembly  
 Titania Hotel, Panepistimiou 52, Athens 10678, Greece  
 08-09 October 2018



### DAY 1 – Monday 8 October

TIME	MAIN ROOM: SOCRATIS HALL – 10th floor (30 persons max)	BREAKOUT ROOM: SOLON HALL – 10th floor (10 persons max)
08:30 – 09:00	Arrival & Registration	
09:00 – 09:15	Welcome and Introduction (Iseult Lynch)	
09:15 – 09:30	Project Management and Coordination (WP1) (Tom Carney - UoB)	
09:30 – 10:00	NA1 – Community Building (WP2) (UKRI)	
10:00 – 10:30	JRA1 – Data Quality Concepts (WP3) (UoB)	
10:30 – 11:00	JRA2 – Knowledge infrastructure (WP4) (DC)	
11:00 – 11:30	Break and Refreshments	
11:30 – 12:00	JRA3 – Analysis and Modelling tools (WP5) (NUID UCD)	
12:00 – 12:30	JRA4 – Tool integration for risk assessment (WP6) (NTUA)	
12:30 – 13:00	NA3 – Dissemination & Case studies (WP9) (BFR)	
13:00 – 14:00	LUNCH	
14:00 – 14:30	NA4 – Integration & Sustainability (WP10) (BIONANONET)	
14:30 – 15:30	TA Processes <ul style="list-style-type: none"> <li>- User Guidance</li> <li>- Tutorials</li> <li>- User Agreement</li> <li>- User Project Submission Process</li> <li>- Other Processes</li> </ul>	
15:30 – 16:00	Break and Refreshments	
16:00 – 17:00	Plenary Session	
19:30	Project Dinner – Location: <a href="#">Black Duck Garden</a> (to be paid for by UoB)	



NanoCommons 2nd General Assembly  
 Titania Hotel, Panepistimiou 52, Athens 10678, Greece  
 08-09 October 2018



## DAY 2 – Tuesday 9 October

TIME	MAIN ROOM	BREAKOUT ROOM
08:30 – 09:00	ARRIVAL	
09:00 – 09:10	Brief Overview of Day 1 & Plans for Day 2 (Iseult Lynch)	
<b>09:10 – 11:00</b>	<b>Transnational Access – Brief Description of Tools being offered (5 min presentation, 5 min questions)</b>	
09:10 – 09:20	WP11 – UoB	
09:20 – 09:30	WP12 – DC	
09:30 – 09:40	WP13 – UKRI	
09:40 – 09:50	WP14 – NTUA	
09:50 – 10:00	WP15 – NUID UCD	
10:00 – 10:10	WP16 – LEITAT	
10:10 – 10:20	WP17 – BFR	
10:20 – 10:30	WP18 – Novamechanics	
10:30 – 10:40	WP19 – BIOMAX	
10:40 – 10:50	WP20 – UM	
11:00 – 11:30	Break and Refreshments	
11:30 – 12:00	Partner TA Training & Dissemination needs	
12:00 – 12:30	NAS – Helpdesk for TA (WP7) (UoB)	
12:30 – 13:00	NA2 – Training aligned to TA / JRA (WP8) (PLUS)	
13:00 – 14:00	LUNCH	
14:00 – 14:30	User Selection Panel <ul style="list-style-type: none"> <li>- Panel Members / Composition</li> <li>- Logistical arrangements</li> </ul>	
14:30 – 15:00	Final Plenary Summary of plans and actions	
15:00	CLOSE OF MEETING & Break and Refreshments	
15:30 – 18:00	1 <sup>st</sup> NanoCommons Hackathon – Ontological Annotations of Datasets	



### 6.3 Annex 3 – List of stakeholders relevant for NanoCommons

A list of stakeholders which can be relevant for NanoCommons has been prepared, gathering the inputs from all Consortium partners, as shown below.

NanoCommons ID	Contributing Partner	Endorsing Partner	Name of person adding the information	Company Name	Company Category	Company Specialisation	Reason of Interest	Is there an established contact with the company?	Link(s) where further information about the COMPANY can be acquired (e.g. company website, LinkedIn page).	
							Personal opinion or prior communication/collaboration	Answer: Yes/No only.	Link 1	Link 2
NC-IL1	UoB		Tassos Papadimitriou	Altana	Research	Biotechnology	NanoMILE partner, developer of biosensors. Maybe they need a data management plan or tools to exploit their data	Yes	<a href="http://www.altana.com/">http://www.altana.com/</a>	<a href="https://www.linkedin.com/company/altana-ah/">https://www.linkedin.com/company/altana-ah/</a>
NC-IL2	UoB		Tassos Papadimitriou	Nano4Imaging GmbH	Research	Instrumentation	NanoMILE partner, MR developer and provider of iron nanomaterials	Yes	<a href="http://www.nano4imaging.com/">http://www.nano4imaging.com/</a>	<a href="https://www.linkedin.com/company/nano4imaging/">https://www.linkedin.com/company/nano4imaging/</a>
NC-IL3	UoB		Tassos Papadimitriou	BAOF	Large	Materials Supplier		Yes		
NC-IL4	UoB		Tassos Papadimitriou	TOZ1				Yes		
NC-IL5	UoB		Tassos Papadimitriou	ECHA	Regulatory			Yes		
NC-IL6	UoB		Tassos Papadimitriou	OSCUBE				Yes		
NC-IL7	UoB		Tassos Papadimitriou	ETSS AG				Yes		
NC-IL8	UoB		Tassos Papadimitriou	GBP Consulting		Consultancy		Yes		
NC-IL9	UoB		Tassos Papadimitriou	Nanotechnologies Industries Association	Other		Lobby	Yes		
NC-IL10	UoB		Tassos Papadimitriou	Malvern Instruments		Instrumentation		Yes		
NC-IL11	UoB		Tassos Papadimitriou	Postnova Analytics		Instrumentation		Yes		
NC-IL12	UoB		Tassos Papadimitriou	PerkinElmer	Large	Instrumentation		Yes		
NC-IL13	UoB		Tassos Papadimitriou	TOPWERK				Yes		
NC-IL14	UoB		Tassos Papadimitriou	HORIBA				Yes		
NC-IL15	UoB		Tassos Papadimitriou	BioIn Scientific				Yes		
NC-IL16	UoB		Tassos Papadimitriou	SOEX				Yes		
NC-IL17	UoB		Tassos Papadimitriou	Promethan Particles Ltd				Yes		
NC-IL18	UoB		Tassos Papadimitriou	VITROCELL				Yes		
NC-IL19	UoB		Tassos Papadimitriou	Eurofins Scientific				Yes		
NC-IL20	UoB		Tassos Papadimitriou	NANO futures	Other			Yes		
NC-IL21	UoB		Tassos Papadimitriou	Centre Suisse d'Electronique et de Microtechnique				Yes		
NC-IL22	UoB		Tassos Papadimitriou	Empa	Research			Yes		
NC-IL23	UoB		Tassos Papadimitriou	INERIS		Consultancy		Yes		
NC-IL24	UoB		Tassos Papadimitriou	EFMD	Regulatory	Regulatory	Government	Yes		
NC-IL25	UoB		Tassos Papadimitriou	BlueFrog Scientific	Regulatory	Consultancy	Regulatory consultancy, having expressed strong interest on our work. Would like to have access to data that can be used to prepare dossiers and even use our laboratory facilities for materials characterisation.	Yes	<a href="http://www.bluefrogscientific.com/">http://www.bluefrogscientific.com/</a>	<a href="https://www.linkedin.com/company/bluefrog-scientific/">https://www.linkedin.com/company/bluefrog-scientific/</a>
NC-IL26	UoB		Tassos Papadimitriou	Steinbel Advanced Risk Technologies		Consultancy		Yes		
NC-IL27	UoB		Tassos Papadimitriou	PROINTIC		Consultancy		Yes		
NC-IL28	UoB		Tassos Papadimitriou	CFIC	Other		Lobby	Yes		
NC-IL29	UoB		Tassos Papadimitriou	Titan Industries Association				Yes		

## D10.2 Interaction Needs and Goals of Nano Safety Projects and Programs

NC-IL30	UoB		Tassos Papadiamantis	BAM	Regulatory			Yes		
NC-IL31	UoB		Tassos Papadiamantis	Nanothinx	SME	Other	Software	Yes		
NC-IL32	UoB		Tassos Papadiamantis	SITEX 45 SRL	SME	Other	Sensors	Yes		
NC-IL33	BNN		Andreas Falk	RAS AG	SME	Materials Supplier	reliable partner, good personal contact	Yes	<a href="https://ras-ag.com/">https://ras-ag.com/</a>	
NC-IL34	BNN		Beatriz Alfaro Serrano	PHORNANO Holding GmbH	SME	Materials Supplier	Reliable partner, good personal contact	Yes	<a href="https://www.phornano.com/">https://www.phornano.com/</a>	
NC-IL35	NTUA		Costas Charitidis	Delta Materials Process and Innovation Solutions	SME	Nanotechnology	Reliable partner, good personal contact, DELTA is interested in characterization of nanomaterials in terms of computational tools since it is involved in synthesis of CNTs and upscaling production	Yes	<a href="http://www.delta-ms.gr/">http://www.delta-ms.gr/</a>	
NC-IL36	NTUA		Costas Charitidis	BioG3D- New 3D Printing Technologies	SME	Other	Reliable partner, This company is engaged with the development of nanomaterials and innovative nanotechnology solutions intended to be used in biomedical applications, subsequently the tools, databases etc. that will be developed within the framework of NanoCommons will be of invaluable importance for their research efforts. The data regarding potential toxicity of engineered nanomaterials and the correlation of physicochemical properties (arising from characterization activities) with any type of cytotoxic behaviour will provide feedback in the development of novel materials and personalised products in the medical sector. Additionally, data from in silico modeling and QSAR analysis could be exploited for the prediction of potential toxicity of engineered nanomaterials upon repeated and prolonged exposure. BioG3D provides specialized services in the fields of Additive Manufacturing techniques (3D printing)	Yes	<a href="http://bio3d.gr/">http://bio3d.gr/</a>	
NC-IL37	PLUS		Albert Duschl	DURAG Grimm	SME	Instrumentation	Aerosol measurement devices	Yes	<a href="https://www.durag.com/company-en/durag-group-en/grimm-en/">https://www.durag.com/company-en/durag-group-en/grimm-en/</a>	