SABYDOMA

SAfety BY Design Of nanoMAterials – From Lab Manufacture to Governance and Communication: Progressing Up the TRL Ladder

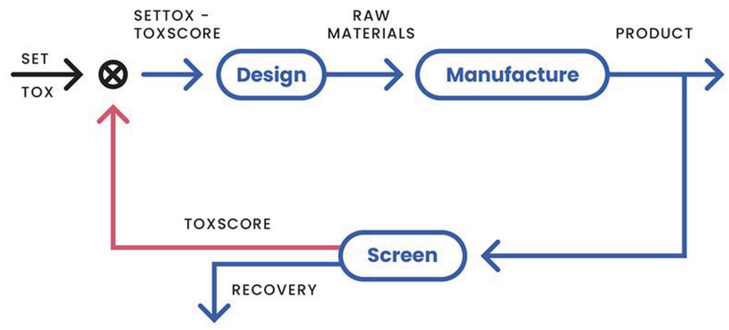
A control system solution to SAfety BY Design Of nanoMAterials

Main Goal of the Project

New methodology and technology to address the existing challenges of Safety-by-Design (SbD) as a control tool for the production of safe(r) nanomaterials, i.e., **addressing the SbD as a Control System Problem.**

Project Outcomes

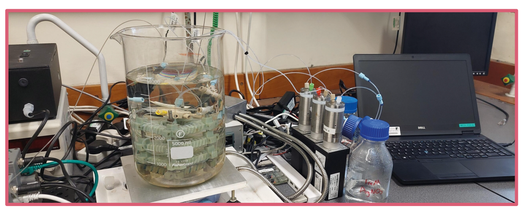
Coupling rapid screening with online production to enable safe(r) nano-manufacture and advance materials. New technology & modelling approaches and SW for real world industrial applications: Demonstrator for online production of safe(r) nano.



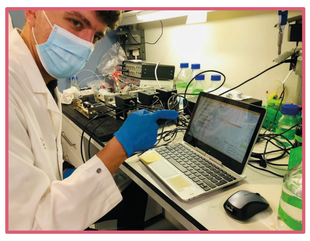
Industrial Case Studies

Case Study 1	Case Study 2	Case Study 3	Case Study 4
Safe Ag (and CuO) NP colloids production	***Coated dental implants***	***Composite electroplating***	***Safe TiO2 production***

SbD technologies developed within four industrial Case Studies involving the **production, use and function of engineered NM.**

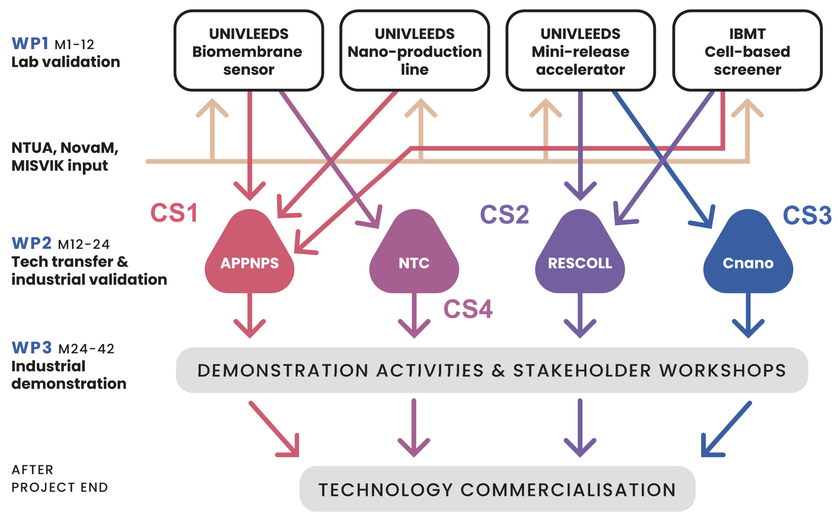


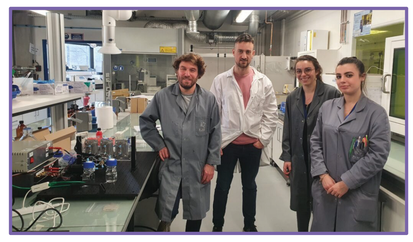
Nano-Production line transfer
UNIVLEEDS > APPNPS – Aug. 2022

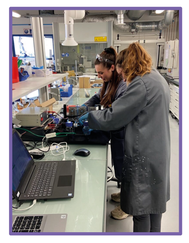


Biomembrane sensor transfer
UNIVLEEDS > APPNPS – May 2022

Project Achievements







Mini-Release Accelerator transfer
UNIVLEEDS > RESCOLL – March 2023

Mini-Release Accelerator transfer
UNIVLEEDS > Cnano – Nov/Dec 2022

UNIVLEEDS – University of Leeds | APPNPS – Applied Nanoparticles S.L.
Cnano – Creative Nano PC | NTC - NanoTechCenter LLC

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www.sabydoma.eu

SbD4Nano
SAFE BY DESIGN FOR NANO

Computing infrastructure for the definition, performance testing and implementation of Safe-by-Design approaches in nanotechnology supply chains

Our mission is to create an e-infrastructure for performance testing & implementation of Safe-by-Design approaches in the nanotechnology supply chain.

A major challenge for the global nanotechnology sector is the development of **safe and functional engineered nanomaterials (ENMs) and nano-enabled products (NEPs).** In order to minimise the risks to human and environmental health during the engineering of NEPs the goal of the SbD4Nano project is to create a **novel e-infrastructure for the definition, performance testing and implementation of Safe-by-Design (SbD) approaches in the nanotechnology supply chains.**

SbD4Nano will overcome all the barriers to promote the implementation of SbD approaches in the nanotechnology industry, providing SMEs with a set of web-based applications and tools.

E-infrastructure

The **"e-infrastructure"** aims to foster dialogue and collaboration between actors along the nanotechnology supply chain for a knowledge-driven definition of SbD approaches based on **hazard, exposure, product performance and cost criteria.**

SbD proposed strategies

Covalent attachment of phenylalanine
Covalent attachment of ethylamine
Covalent attachment of glucose
Covalent attachment of glycine
Functionalized TiO_2 & ZnO
Functionalized SiO_2 NPs

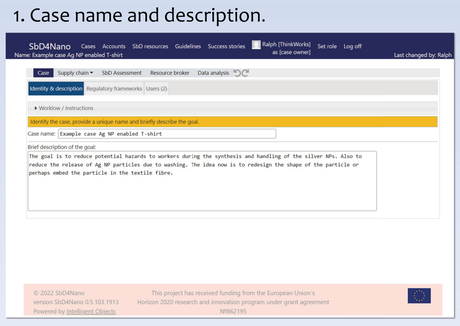
Surface engineering approaches

- **Release ↓**
- **Exposure control**
- **Toxicity ↓**
- **Ecotoxicity ↓**
- **RMM implementation**
- **Functional products**

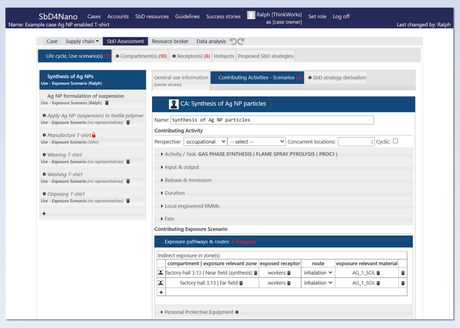
Engineered nanomaterials (ENMs)

- Metal oxide nanoparticles (TiO_2, ZnO)
- Core-shell silica nanoparticles
- Carbon nanofibers
- Graphene oxide

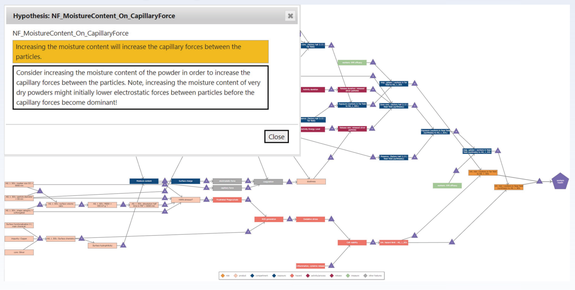
1. Case name and description.



2. Information on the activity.



3. **Influence diagram** generated by the e-Infrastructure.



4. Ranking of **SbD strategies** derived from the influence diagram.

The e-infrastructure is validated in case studies and then implemented at a larger scale to assist and guide industry, regulators, and civil society in the design of well-balanced safety, functionality and cost strategies.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 862195.

www.sbd4nano.eu

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