

<u>POTENTIAL</u>: Platform Optimisation To Enable NanomaTerIAL safety assessment for rapid commercialisation.

Launched in January 2023. Duration 4 years

The project **<u>POTENTIAL</u>** is supported by the European Union's HORIZON Europe Research and Innovation programme, under Grant Agreement N°101092901

Nanotechnologies exploit properties of matter that arise at a very small scale and are far more embedded in our daily lives than what we normally imagine: The UV-blocking properties of common sunscreen come from Titanium dioxide and Zinc oxide nanoparticles. Phenylene-diamine and terephthaloyl chloride monomers make Kevlar resistant and waterproof. Computers? Modern chips can be less than 10 nanometres small.



Nanomaterials give their properties to nanotechnology-enabled products, such as sunscreen, lenses and screens, clothing and electronics.

When nanotechnology is used and deteriorates, nanomaterials can make their way into the environment where they spread with virtually no resistance. They can deposit on the surface of larger particles and be taken up by living organisms, for example through ingestion. It is particularly hard to measure exposure to nanomaterials since detecting and monitoring them in the environment is challenging. In addition to being very tiny, nanomaterials tend to bind to and hide in so-called "environmental matrices" (e.g., water, soil, organic leftovers, organic tissues, and biofilms). Nanomaterial behaviour in the environment is therefore relatively unknown and, more importantly, we do not know if they may represent a hazard to the health, biodiversity and environmental processes. Because of this ubiquitousness and elusiveness, the

European Union is promoting research on understanding the properties of nanomaterial, their lifecycle, interactions with ecological and biological matrices as well as on developing coherent methodologies and protocols for the detection, quantification and characterisation of nanomaterials in complex matrices.

POTENTIAL (Platform Optimisation To Enable NanomaTerIAL safety assessment for rapid commercialisation) is a Horizon Europe project aiming at standardising how nanomaterials are investigated. "We have several methods to quantify how nanomaterials can be hazardous," says POTENTIAL coordinator, Dr. Luisa Diomede from the Istituto di Ricerche Farmacologice Mario Negri IRCCS in Milan. "However, it is important that any methodology we may use is designed to be interoperable between laboratories, applicable in an industrial setting, and ultimately becomes standard".



POTENTIAL is looking at the entire pathway of physical-chemical characterization and ecotoxicity assessment of Advanced Nanomaterials (those are, for example, thin-film zeolites, carbon nanotubes, graphene semiconductors), with the intent of developing standard protocols for:

- imaging of nanomaterials and their bioprocessing at submicron resolution in complex matrices, including culture cells and biological tissues;
- > advanced characterization of nanomaterials throughout their lifecycle;
- assessment of ecotoxicology and health hazard;
- Scouping (i.e., organise categories) and *Read-across* (i.e., model behaviour across types)

The research activities are guided by crosstalk with international regulatory bodies: the Organisation for Economic Cooperation and Development (OECD), the International Standards Association (ISO), and the European Committee for Standardisation (CEN).

POTENTIAL is a partnership coordinated by the **Istituto di Ricerche Farmacologiche Mario Negri IRCCS** (IRFMN - Italy). The partnership includes 6 research centres and 5 companies:

The 3-million-euro project started on January 1st 2023 and will last for 4 years until January 2027, and has received funding from the European Union's Horizon Europe Research and Innovation Actions programme under Grant Agreement 101092901

Website: <u>www.potential-eu.eu</u> <u>The POTENTIAL Kickoff Meeting</u> Inquiries: innova@potental-eu.eu



Project partners:

















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