ACEnano
Analytical and Characterisation Excellence

Analytical and Characterisation Excellence in nanomaterial risk assessment: A tiered approach

ACEnano users' workshop

"You Ask – ACEnano Replies"

This workshop has two main purposes:

1. to **generate awareness** in the NanoSafety community (academic, industry, regulatory) of the analytical techniques, tools and approaches developed by ACEnano;
2. to **provide a forum** for the NanoSafety community to ask questions about specific outputs of ACEnano and how they might address their needs.

Structure:

The workshop will start with introductory information about the workshop and the project, followed by two expert round tables, focussing on how the project could address regulator and industry needs, respectively. This will be followed by parallel sessions on tools (based on preferences expressed by those registered to attend, see "Questions") and finally a question and answer session with the attendees.

Questions:

Round table 1	→ How can ACEnano support risk assessors? → What are the **obstacles and advantages**, if any, for risk assessors to use the ACEnano approaches?
Round table 2	→ How can ACEnano support SMEs/industry? → What are the **main barriers and how to overcome them** for SMEs/industries in getting the analytical information they need? What end points/media are important for SMEs/industries?
Parallel session on tools	→ From the techniques/tools/approaches listed below, which one(s) would you like to know more about? **Participants, please respond to info@acenano-project.eu by 16th November.**

Techniques/Tools/Approaches in ACEnano

- Single particle ICP-TOF-MS, to enable **multi-compositional nanomaterial characterization at lower detection limits**
  – e.g. Tofwerk & ETH Zurich video
- Single cell ICP-MS (SC-ICP-MS), for the **quantification of nanoparticles in individual cells** – e.g. Monikh et al, 2019
- Microfluidic device to enable **fast & reproducible assays**, such as for **reactivity and dissolution assessment**
  – e.g. CSEM (Schmid) video
- Hydrophobic interaction chromatography for a **novel nanomaterial hydrophobicity assay**;
  – e.g. CSEM (Burr) video
- Method hyphenation for **microplastic identification**
- Capillary electrophoresis, for **rapid and reliable nanomaterial corona characterization**;
  – e.g. Chetwynd et al., 2020
- TOF-SIMS for **identification/localization of nanomaterials in complex biological media** in 3D, – e.g. Benettoni et al, 2019
- Miniaturisation of an air-liquid interface simulator for **fast assessment of cellular nanomaterial toxicity**;
- Optimal sample preparation for **characterization of nanomaterials in either solid or suspended form**;
- Harmonised sample introduction **pretreatment for nanomaterial suspensions**;
- Liquid chromatography/Laser desorption ionisation for the **online size separation and surface characterisation of organic nanoparticles or ligands/polymers on nanomaterial surfaces**;
- Streamlined established methodologies via interlaboratory comparisons and published video papers
  – e.g. Briffa et al, 2020, JoVE

For more information on ACEnano: **youtube channel**

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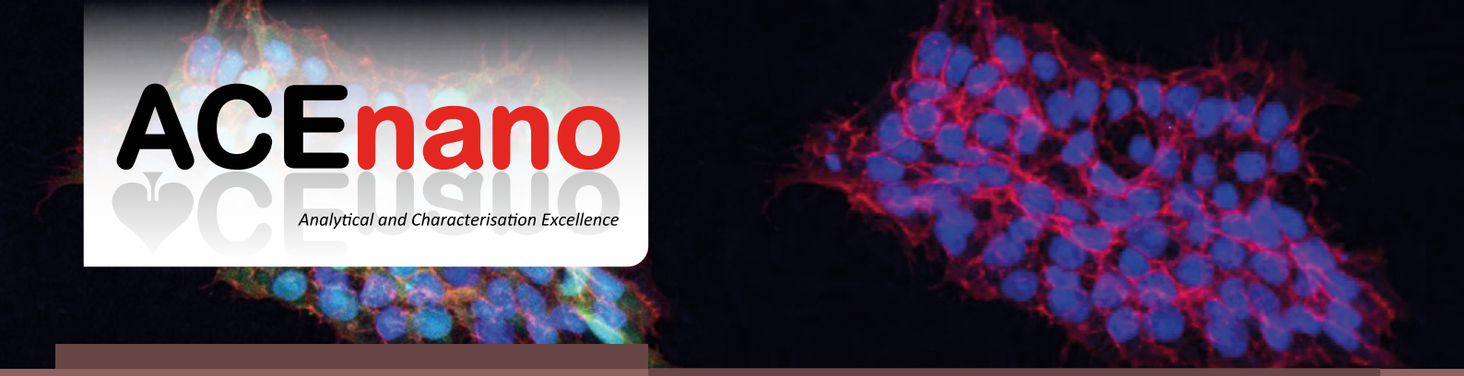

What is ACEnano?

ACEnano is providing confidence, adaptability and clarity into nanomaterial risk assessment by

- **Innovation** in nanomaterial physico-chemical characterization methods;
- Delivery of a **robust, tiered approach in characterization**;
- Development of **widely implementable analytical tools**, with a simple and facile contextual description;
- Generation of a **framework for prioritizing analytical approaches to nanomaterial characterization**;
- Support for stakeholders and users, e.g. in the choice of optimal analytical approach for their needs.

What are the key innovations of ACEnano?

- Method **alignment and simplification**;
- Comprehensive **physicochemical characterization**;
- Universal **sample preparation and introduction systems**;
- Harmonisation of hardware to **reduce equipment cost**;
- Error reduction through **enhanced data management**;
- Tools for improving the **comparability of methods**.

What tools and guidance is ACEnano developing?

- **Analytical innovation** in either novel or poorly developed techniques;
- **Optimisation** of existing techniques and instrumentation;
- **Benchmarking and standardisation** of well developed techniques;
- **Data capturing and warehousing** innovations;
- **Video demonstrations** of key analytical techniques;
- **Decision tool to guide users** (especially SMEs) through selection of the most appropriate methods to address their needs for risk assessment.

What are the expected impacts of ACEnano?

- **Confidence in measuring key descriptors** relevant to assessing the health and environmental impacts of nanomaterials;
- Support for **grouping, read-across and QSARs**;
- **Improved reliability in nanosafety studies and findings** through sound physico-chemical characterisation methods and standard operating procedures;
- **Reduction in costs** related to the physico-chemical characterisation of nanomaterials in relevant media;
- **Synergies** with applications of the methods in other areas such as quality control, product traceability, labelling and counterfeiting.

Consortium: A multidisciplinary team of 26 members from 9 countries.

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For updates on ACEnano outcomes, activities and events visit:

www.acenano-project.eu