December 2025

Newsletter

NanoSafety

(Nano)particle exposure levels and characterization, toxicity mechanisms, health effects, and knowledge transfer

Left: **Andi Alijagic giving the talk.**
Right: **View of the Acropolis.**

NanoSafety2 at EuroTox 2025

Andi Alijagic attended EUROTOX 2025, where he presented recent work on the immunotoxicological effects of particulate matter emitted during post-processing of metal additive manufacturing. The study combined detailed physicochemical particle characterization with multi-omics analyses in human macrophages, revealing acute, dose-dependent inflammatory responses, transcriptional and metabolic effects. The findings highlight post-processing as an understudied but potentially critical exposure scenario in industrial additive manufacturing, emphasizing the need for improved nanosafety and risk mitigation strategies.

High-volume particle sampling

Within Nanosafety2, high-volume, size-resolved particle sampling is performed with AMM at Linköping University at three industrial partners printing metals and plastics. A Dekati cascade impactor (70 L/min) is used to collect five particle size fractions, providing realistic exposure samples that are highly valuable for SP2.

NanoSafety2 team as Lasertech

SP1&3 plans in early 2026

New sampling campaign is planned for the early 2026.

Week 6 (2026): Siemens Energy

Week TBD (2026): AMEXCI

Week TBD (2026): Lasertech

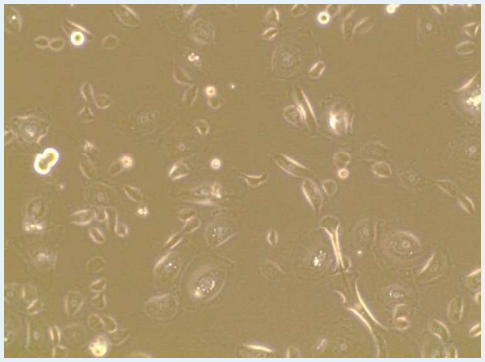
AQ Guard Smart 2000

New measurement devices in NanoSafety2

Mikael Ramström (Alnab) has carried out measurements at Siemens Energy using the AQ Guard Smart 2000. During the planned measurement week at Siemens Energy in February 2026, side-by-side measurements with existing instruments will be performed to compare instrument performance and outcomes. At the latest SP1 & SP3 meeting, Mikael also introduced DustView II as a potential alternative instrument for future material dustiness evaluations. DustView II is a fully automated dust measurement system designed to characterize dust formation from powders and bulk materials generated during free fall and impact. It enables rapid, precise, and reproducible assessment of even very small dust fractions.

Ongoing particle *in vitro* testing in SP2

A pilot three-week skin exposure study on eleven metal AM powders was completed, with imaging completed and samples collected for omics analyses. Airborne polyamide particles are being tested for viability, oxidative stress, and cell morphology. In parallel, aged polyamide microplastics and plastic e-waste from pilot AM are being analyzed for cellular and metabolic effects. A new exposure model using primary human nasal epithelial cells has also been established and is under initial testing.



Human primary nasal epithelial cells