April 2026

Newsletter

NanoSafety

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

Short bursts of high particle exposure during specific AM tasks.

Hidden Peaks in Particle Exposure in AM

Recent NanoSafety2 measurements show that while overall **dust levels in additive manufacturing (AM) remain well below occupational exposure limits (OEL)**, workers can experience short-term peaks of nanoparticle exposure during specific tasks. Activities such as powder handling and post-processing can generate **bursts reaching up to 2.5 million particles/cm³**, highlighting the importance of targeted exposure control despite low average levels.

Ongoing Health Monitoring

NanoSafety2 continues to bridge research and industry, **with biological samples collected from ~60 workers** to assess real exposure effects. Early findings have already contributed to improved protective measures in AM facilities. Upcoming analyses of blood, urine, and lung lining fluid will further support evidence-based occupational safety strategies in the coming years.

Monitoring worker health to improve safety

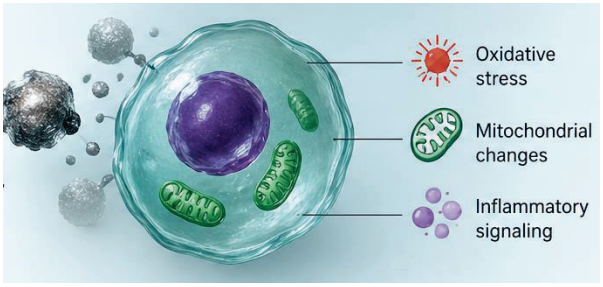
SP1&3 plans in 2026/2027

New sampling campaign is planned for the 2026 and 2927.

Week 46 (2026): Lasertech

Week 50 (2026): AMEXCI

Week 7 (2027): Siemens Energy



Particles cause early cell stress, even without clear toxicity.

Low Acute Toxicity, but Early Cellular Stress Signals Detected

Studies on **inhalation and dermal exposure** to AM particles show generally low short-term toxicity in human cells. However, **subtle biological responses were observed**, including oxidative stress, mitochondrial changes, and mild inflammatory signaling. These findings emphasize that even without immediate toxicity, early cellular stress markers should be considered in long-term risk assessment.

Meet Nadia Boroumand, a New NanoSafety Postdoc

I recently joined Örebro University as a postdoctoral researcher after completing my PhD at Stockholm University. During my PhD, I worked on developing advanced *in vitro* systems, including air–liquid interface (ALI) and 3D lung models, to study inhalation exposure in a more physiologically relevant way. In NanoSafety2, my role is mainly focused on working with *in vitro* models to study how particles from additive manufacturing interact with lung cells.

Nadia Boroumand