Rules and procedures for use of the instrument NANOSIGHT PRO PARTICLE ANALYSER purchased under the MUR Department of Excellence Project 2023–2027

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Approved by the Department of Excellence Steering Committee on 03/09/2026

Approved by the Council of the Department of Food and Drug on 09/09/2026

Description of the technique

The NanoSight Pro uses NTA (Nanoparticle Tracking Analysis) to characterise nanoparticles in liquid suspension, with a typical size range of 10–1,000 nm.

The technique uses laser illumination of the particles, which scatter light and are observed by a high-sensitivity camera.

The software records the Brownian motion of individual particles in real time, measures their diffusion coefficient and converts it into hydrodynamic diameter using the Stokes–Einstein equation.

The system can also measure sample concentration (particles per mL) by counting the particles visible within the camera's field of view.

In addition to measuring particle size and number concentration, the NanoSight Pro can perform fluorescence analysis, using optical filters to separate fluorescence emission from scattered light. This enables identification and quantification of specific subpopulations of fluorophore-labelled particles.

Instrument description

The main instrument modules and accessories are:

- **Interchangeable laser module:** The system can be fitted with replaceable laser modules, with a choice of two wavelengths (488 nm and 532 nm), enabling selective particle illumination for scattering analysis or fluorescence excitation.
- **Flow cell:** Enables continuous sample flow through the laser module when combined with a syringe pump.
- **Syringe pump:** Provides controlled, reproducible sample flow through the flow cell.
- **Optical system (microscope + objective):** An optical assembly with a lens that collects scattered light (or fluorescence emission) from the illuminated particles and directs it towards the acquisition camera.
- **Camera**: Captures the light signals (scattering and fluorescence) produced by the particles, recording videos that the software uses for tracking and analysis.
- **Acquisition and analysis software (NS Xplorer):** Controls instrument settings and sample flow, records videos and tracks particles to generate the final data.
- **Long-pass optical filters:** In fluorescence mode, optical filters (500 nm and 565 nm) separate fluorescence from scattered light.

Authorised permanent staff and trainers

Surname	First name	Dept./Centre	Contact
Sonvico	Fabio	Food and Drug	fabio.sonvico@unipr.it
Varacca	Giada	Food and Drug	giada.varacca@unipr.it

The list of authorised staff is kept up to date and is available in **Annex 2** to these Rules.

Instrument access and use

1) ALIFAR Department research groups with authorised users may access the instrument through their own staff, subject to prior booking on the dedicated Teams platform managed by the Technical Contact. Groups without a designated contact may contact the relevant staff. Access remains subject to booking on the Teams platform. Use of the instrument without a booking will result in a charge for a full working day of eight hours. Use is restricted to staff who have completed the initial training (authorised staff and trainers) or have subsequently been trained by the trainers.
2) Users from other University departments and external users may contact the Scientific Supervisor by completing the analysis request form (**Annex 1**).

Fees

Three user categories apply to instrument usage fees:

1) ALIFAR users: academic and research staff of the University of Parma affiliated with the ALIFAR Department;
2) Internal users: academic and research staff of the University of Parma;
3) External users: researchers and operators from universities, research bodies and public or private institutions.

Type of analysis	ALIFAR USER €/hour	INTERNAL NON-ALIFAR USER €/hour	EXTERNAL USER €/sample in triplicate
Analysis of the size and concentration of particles in suspension using NanoSight Pro	2	25	350

ALIFAR users who use their research funds to contribute to annual preventive maintenance and/or insurance contracts (*all risks*) or to pay for repairs will not be charged until their contribution has been offset in full.

Annex 1. PARTICLE ANALYSER – ANALYSIS REQUEST FORM

to be emailed to authorised staff

Applicant details

INTERNAL USER AT THE UNIVERSITY OF PARMA
Dept./Centre:
Applicant:
Instrument user:
E-mail:
Telephone:

EXTERNAL USER
Organisation name:
VAT no./Tax code
Address:
Applicant:
Instrument user:
E-mail:
Telephone:

Information on samples and type of analysis

Number of samples to analyse (including blanks)	*e.g. "3 samples + 1 blank, all in triplicate = 12 samples in total"*
Sample type (briefly describe, specifying the matrix)	*e.g. "Extracellular vesicles isolated from human plasma", "Polymeric nanoparticles in PBS or other buffers…"*
Matrix clean-up	☐ YES ☐ NO Clean-up method used: e.g. centrifugation, ultracentrifugation, filtration, dialysis...
Sample conditions	*e.g. "solvent/buffer, viscosity, pH, additives..."*
Preferred measurement mode	☐ Scattering ☐ Fluorescence (specify fluorophore)
Fluorophore used (if applicable)	*State the name and excitation/emission wavelength*
Available volume	*State the total volume for each sample (minimum 500 µL recommended)*
Risk factors	☐ flammable ☐ irritant ☐ acute toxicity ☐ harmful ☐ corrosive ☐ oxidising ☐ carcinogenic/mutagenic ☐ hazardous to the environment

Bookings may be cancelled up to the third working day before the requested date.

If the booking is not cancelled in time, the service will be charged even if it is not used.

Date …….

Applicant's signature (fund holder)

……

Annex 2. Staff authorised to use the instrument

Permanent staff and trainers			
Surname	**First name**	**Dept./Centre**	**Contact**
Sonvico	Fabio	Food and Drug	fabio.sonvico@unipr.it
Varacca	Giada	Food and Drug	giada.varacca@unipr.it
Authorised permanent staff			
Surname	**First name**	**Dept./Centre**	**Contact**
Bianchera	Annalisa	Food and Drug	annalisa.bianchera@unipr.it
Pescina	Silvia	Food and Drug	silvia.pescina@unipr.it
Quarta	Eride	Food and Drug	eride.quarta@unir.it
Instrument users			
Bazzoli	Gianluca	Food and Drug	gianluca.bazzoli@unipr.it
Davolio	Ilaria	Food and Drug	ilaria.davolio@unipr.it
Filice	Mariachiara	Food and Drug	mariachiara.filice@studenti.unipr.it
Montagna	Sofia	Food and Drug	sofia.montagna@unipr.it