Rules and procedures for use of the FLOW CYTOMETER purchased under the MUR Department of Excellence Project 2023–2027

ACADEMIC CONTACT
Prof. Simona BERTONI simona.bertoni@unipr.it

TECHNICAL CONTACT
Dr Lisa FLAMMINI lisa.flammini@unipr.it

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

Instrument description

The Attune NxT flow cytometer (Thermo Fisher Scientific) is a new-generation flow cytometer that combines acoustic focusing with conventional hydrodynamic focusing, enabling high sampling rates with high sensitivity.
The instrument has a blue laser (488 nm) and four fluorescence detectors (503/30 nm, 574/26 nm, 695/40 nm, 780/60 nm), enabling complex multiparameter analysis of heterogeneous cell populations. Flow rates range from 12.5 µL/min to 1 mL/min, with acquisition rates of up to 35,000 events per second while maintaining high optical resolution.
It can be used for cell counting, characterising cell populations using fluorescent markers, immunophenotyping studies, cell cycle analysis, rare event detection and other types of biological analysis.

Main instrument modules:

Fluidics module

- Controls sample movement and pressurisation through the fluid stream.
- Includes reservoirs for focusing fluid (working fluid), waste and cleaning solutions (washing and disinfection).
- Equipped with a precision syringe pump that accurately controls the sampled volume and flow rate (from 12.5 µL/min to 1,000 µL/min).
- Contains the acoustic focusing system, which uses ultrasonic sound waves to align cells in the centre of the fluid stream, improving sensitivity and repeatability.

Optical module

- Includes the laser, mirrors, filters and detectors for excitation and collection of fluorescence and light scatter signals (FSC, SSC).
- Features one blue laser (488 nm) and four fluorescence detectors (503/30 nm, 574/26 nm, 695/40 nm, 780/60 nm).
- Includes photodiodes and photomultiplier tubes to detect and amplify optical signals.
- Signals are digitised by a high-resolution electronic module.

Electronics / processing module

- Controls analogue signal acquisition and digitisation.
- Processes pulse intensity, area and width parameters in real time.
- Coordinates communication with the control computer via a USB interface.
- Includes safety systems and sensors for pressure, temperature and fluid levels.

Control and analysis software

- Attune NxT Software (Thermo Fisher): a graphical interface that manages all acquisition, gating and compensation parameters.
- Includes tools for:
    - voltage settings;
    - automatic calibration (via performance testing);
    - real-time analysis of dot plots and histograms;

- exporting data in FCS (Flow Cytometry Standard) format, compatible with external analysis software such as FlowJo or FCS Express.

Maintenance and calibration module

- Integrated system for automatic cleaning of fluidic lines and daily calibration (performance testing with beads).
- Supports automated startup, shutdown and decontamination routines.

Authorised permanent staff and trainers

Surname	First name	Dept./Centre	Contact
Flammini	Lisa	Food and Drug	lisa.flammini@unipr.it
Carmine	Giorgio	Food and Drug	giorgio.carmine@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 USER €/hour**	**EXTERNAL USER €/sample***
Analysis of an unlabelled sample (based on size and complexity only, FSC/SSC)	10	15	90 (UNIPD)
Analysis with one fluorescent marker	15	20	110
Analysis with multiple fluorescent markers	20	25	130

* for every 5 analyses ordered, the sixth is free of charge OR data processing costs are waived.

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. ATTUNE NxT FLOW CYTOMETER
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 replicates and blanks)	
Sample type (briefly describe the nature of the sample, cell type, bacteria or other material)	
Type of analysis requested	☐ composition of a heterogeneous population ☐ quantification of viable cells ☐ cell cycle assessment ☐ other
Presence and type of fluorescent markers	
Risk factors	☐ flammable ☐ irritant ☐ acute toxicity ☐ harmful ☐ corrosive ☐ oxidising ☐ carcinogenic/mutagenic ☐ hazardous to the environment ☐ biohazard
Data processing	

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)

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Annex 2. Staff authorised to use the instrument

Authorised permanent staff and trainers			
Surname	**First name**	**Dept./Centre**	**Contact**
Flammini	Lisa	Food and Drug	lisa.flammini@unipr.it
Carmine	Giorgio	Food and Drug	carmine.giorgio@unipr.it
Authorised non-permanent staff and trainers			
Surname	**First name**	**Dept./Centre**	**Contact**
Chiara	Maria Linda	Food and Drug	marialinda.chiara@unipr.it