UNIVERSITÀ DI PARMA

DIPARTIMENTO DI SCIENZE DEGLI ALIMENTI E DEL FARMACO

ALIFAR DIPARTIMENTO DI ECCELLENZA MUR 2023-2027

Rules and procedures for use of the GEL PERMEATION CHROMATOGRAPHY (GPC) AND SIZE EXCLUSION CHROMATOGRAPHY (SEC) SYSTEM WITH FOUR DETECTORS purchased under the MUR Department of Excellence Project 2023–2027

ACADEMIC CONTACTS

Prof. Barbara CAMPANINI barbara.campanini@unipr.it

Prof. Pedro MENA pedromiguel.menaparreno@unipr.it

TECHNICAL CONTACT

Dr Luca Calani luca.calani@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

With its range of detectors and capability for qualitative and quantitative analysis, the instrument system can be used for various applications in food and pharmaceutical research.
The instrument system can mainly be used for: a) qualitative and quantitative analysis of various biomolecules of food and pharmaceutical interest, primarily low- and high-molecular-weight carbohydrates, proteins and tannins; b) determination of protein aggregation states under different environmental conditions; c) studies of protein–protein complex formation; d) analysis of very low-molecular-weight molecules such as organic acids and alcohols.

Main instrument modules and accessories:

- **1260 Infinity II Bio-Inert Pump**. The 1260 Infinity II Bio-Inert Pump is a quaternary pump with low-pressure mixing and integrated solvent degassing. It is ideal for biological applications, even at extreme pH values (range: 1–13). The titanium-based pump offers maximum corrosion resistance, even with high-salt buffers (2 M). It operates at a maximum backpressure of 600 bar at up to 5 mL/min and 400 bar at up to 10 mL/min. The pumping system delay volume is approximately 600–900 µL, varying with backpressure. Solvent-contact materials are titanium, gold, platinum/iridium, sapphire, PEEK, PEKK and PTFE, ensuring biocompatibility, bio-inertness and operation even under extreme pH conditions.
- **1260 Infinity II Bio-Inert Multisampler.** The multisampler is 100% metal-free, making it ideal for biomolecular applications, including monoclonal antibodies (mAbs), proteins in general and oligonucleotides. A ceramic needle, PEEK needle seat and stainless-steel-clad PEEK capillaries ensure bio-inertness and maximum injection precision. The automated multisampler is a programmable, variable-loop flow-through system supporting different injection volumes (range: 0.1–100 µL). The current configuration comprises one drawer holding 2 × 54 vials of 1.5–2 mL and a temperature-control system operating from 4 to 40 °C.
- **Agilent G7116B 1290 Infinity II Thermostatted Column Compartment.** The column temperature-control module operates over a wide range, from 20 °C below ambient temperature (minimum 4 °C) to 110 °C. It has two independent heat exchangers with configurable volume and temperature. It accommodates up to four 30 cm columns or eight 10 cm columns, managing four simultaneously.
- **1260 Infinity II MDS GPC Dual Angle LSD System.** The dual-angle light scattering detector measures light scattered by polymer molecules at two angles: a high angle of 90° for precision and a low angle of 15° for accuracy. Combined with a concentration detector, the LSD provides: i) absolute molecular weights without column calibration; ii) accurate assessment of molecular dimensions, hydration radius (Rg) and hydrodynamic radius (Rh); iii) direct determination of long-chain branching. The Dual Angle LSD has a 10 µL scattering flow cell. Laser power is 50 mW and laser wavelength is 660 nm. The detector can be set to temperatures from 30 to 60 °C. Usable pH range: 2–10. The detector can only be used in GPC/SEC mode.

- **1260 Infinity II Refractive Index Detector.** The detector of choice for compounds without chromophores, configured for both GPC/SEC applications and analytical mode. It has an 8 µL cell and can maintain a constant optical unit temperature up to 55 °C. A mobile-phase recycling valve is particularly useful during detector stabilisation, which usually takes several hours, avoiding waste of the mobile phase required for analysis.
- **1260 Infinity II Diode Array Detector.** Configured for both GPC/SEC applications and analytical mode, the detector operates from 190 to 950 nm using deuterium and tungsten lamps. It can acquire up to eight signals simultaneously at eight different wavelengths. It has a 13 µL bio-inert flow cell with a 10 mm optical path length.
- **1260 Infinity II Fluorescence Detector.** The Agilent fluorescence detector has separate excitation and emission monochromators and covers excitation and emission wavelengths from 200 to 1,200 nm using a xenon lamp. It has an 8 µL bio-inert flow cell. The detector can only be used in analytical mode.
- **Agilent GPC**-SEC Software. Dedicated software for module control, method development and data processing in GPC-SEC mode, enabling universal calibration and calculation of molecular weight moments and distributions.
- **OpenLab CDS Instrument Control Software.** Dedicated software for module control in analytical mode, method development and chromatographic data processing.

Authorised permanent and non-permanent staff

Surname	First name	Dept./Centre	Contact
Bazzoli	Gianluca	Food and Drug	gianluca.bazzoli@unipr.it
Buoli Comani	Valeria	Food and Drug	valeria.buolicomani@unipr.it
Calani	Luca	Food and Drug	luca.calani@unipr.it
De Bei	Omar	Medicine and Surgery	omar.debei@unipr.it
De Paolis	Marco	Food and Drug	marco.depaolis@unipr.it
Dobani	Sara	Food and Drug	sara.dobani@unipr.it
Fuso	Andrea	Food and Drug	andrea.fuso@unipr.it
Romanelli	Bianca	Food and Drug	bianca.romanelli@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) or have subsequently been trained by authorised staff.
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 €/hour**
HPLC analysis with one detector	2.5	20	41
HPLC analysis with two detectors	3.5	28	56
HPLC analysis with three detectors	5	40	80

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. GEL PERMEATION CHROMATOGRAPHY (GPC) AND SIZE EXCLUSION CHROMATOGRAPHY (SEC) SYSTEM WITH FOUR DETECTORS – 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

Total analysis hours (including pre- and post-analysis conditioning)	*e.g. "2 hours of pre-analysis system conditioning + 12 hours of analysis + 1 hour of post-analysis system storage"*
Sample type (briefly describe, specifying the matrix)	*e.g. "Food extracts", "Active pharmaceutical ingredients", etc.*
Matrix clean-up	*** YES * NO** Clean-up method used: e.g. centrifugation, ultracentrifugation, filtration, dialysis...
Sample conditions	*e.g. "solvent/buffer, pH, additives, concentration..."*
Detectors used	☐ Dual Light Scattering ☐ Diode Array (DAD) ☐ Fluorescence ☐ Refractive Index (RID)
Sample storage conditions	☐ RT ☐ 4°C ☐ - 20°C
Available volume	*State the total volume for each sample (minimum 50 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

Authorised staff and trainers			
Surname	**First name**	**Dept./Centre**	**Contact**
Buoli Comani	Valeria	Food and Drug	valeria.buolicomani@unipr.it
Calani	Luca	Food and Drug	luca.calani@unipr.it
De Bei	Omar	Medicine and Surgery	omar.debei@unipr.it
De Paolis	Marco	Food and Drug	marco.depaolis@unipr.it
Romanelli	Bianca	Food and Drug	bianca.romanelli@unipr.it
Instrument users			
Surname	**First name**	**Dept./Centre**	**Contact**
Bazzoli	Gianluca	Food and Drug	gianluca.bazzoli@unipr.it
Dobani	Sara	Food and Drug	sara.dobani@unipr.it
Fuso	Andrea	Food and Drug	andrea.fuso@unipr.it