# Regulations and procedures for the use of the equipment AUTOMATED FLASH CHROMATOGRAPHY SYSTEM WITH TWO COLUMN LINES AND UV/VIS DETECTION purchased under the MUR 2023–2027 Department of Excellence Project

**ACADEMIC CONTACT**
Prof. Marco RADI marco.radi@unipr.it

**TECHNICAL CONTACT**
Dr Marco DE PAOLIS marco.depaolis@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 Sciences on 09/09/2026**

## Equipment description

The laboratory is equipped with a Biotage® Selekt high-performance automated flash chromatography purification system (Academy Bundle Single Bed UV-VIS). This advanced platform is designed to provide fast, flexible, high-resolution purification of synthetic mixtures and natural extracts, optimizing processing times and minimizing solvent consumption.

**Main modules, components and functions of the equipment:**

- **Solvent Pumping and Delivery Unit: System with four independent solvent lines and two chromatography column channels, operating at flow rates from 1 to 300 mL/min and a maximum pressure of 30 bar (435 psi). It enables instant switching between normal-phase and reversed-phase operation using orthogonal solvent systems without interrupting the workflow.**
- **Ultraviolet–Visible (UV-VIS) Detector: Advanced high-sensitivity photometric detector for continuous monitoring of absorption in the UV-visible range. It enables accurate peak identification and absorbance-guided fraction collection to maximize the purity of collected compounds.**
- **Single Collection Bed and RFID Rack Management: Fraction collection module with integrated RFID technology for automatic identification and tracking of racks and collection vessels (from test tubes to flasks).**
- **Touchscreen Control Interface and QR Code Reader: Integrated user interface with a 15-inch touchscreen and QR/RFID code reader for automatic loading of methods and parameters of prepared columns (e.g., Biotage® Sfär and Rening ranges), eliminating manual setup errors.**
- **Advanced Software Package (e.g., Biotage® Spektra): Management software enabling simultaneous acquisition at all wavelengths (λ-All), real-time 2D and 3D spectral visualization, signal focusing on narrow ranges, and automatic gradient optimization to maximize resolution and loading capacity.**

**Main Fields of Application**

The system is certified for qualitative and quantitative preparative purification (from milligrams to hundreds of grams of sample) in various scientific and research fields, including:

- **Synthetic organic chemistry and medicinal chemistry: rapid isolation and purification of reaction intermediates, active pharmaceutical ingredients (APIs), and libraries of synthetic compounds.**
- **Natural products chemistry and pharmacognosy: fractionation and isolation of secondary metabolites (e.g., flavonoids, alkaloids, terpenes) from plant extracts and complex matrices.**
- **Biomolecule and peptide purification: preparative reversed-phase separations (e.g., C18 and C4 columns) for peptides and medium- to high-molecular-weight molecules.**
- **Method development and scale-up: rapid conversion from linear gradients to step gradients to increase column loading capacity and reduce run times and solvent waste.**

## Authorized staff and trainers

| Surname | First name | Department/Centre | Contact |
|---|---|---|---|
| Radi | Marco | Food and Drug Sciences | marco.radi@unipr.it |
| Costantino | Gabriele | Food and Drug Sciences | gabriele.costantino@unipr.it |
| Pieroni | Marco | Food and Drug Sciences | marco.pieroni@unipr.it |
| Biagi | Marco | Food and Drug Sciences | marco.biagi@unipr.it |
| Annunziato | Giannamaria | Food and Drug Sciences | giannamaria.annunziato@unipr.it |
| De Paolis | Marco | Food and Drug Sciences | marco.depaolis@unipr.it |

The list of authorized personnel is kept up to date and is available in Annex 2 to these Regulations.

**Access to and use of the equipment**

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

**Fee schedule**

Three categories of users are defined for equipment usage charges:

1) 1) ALIFAR users: faculty members and researchers of the University of Parma affiliated with the ALIFAR Department;
2) 2) Internal users: faculty members and researchers of the University of Parma;
3) 3) External users: researchers and staff of universities, research organizations, and public and private institutions.

| **Type of analysis** | **ALIFAR USER €/sample in triplicate*** | **INTERNAL NON-ALIFAR USER €/sample in triplicate*** | **EXTERNAL USER €/sample in triplicate*** |
|---|---|---|---|
| Standard Flash Purification (Single Run) | 22 | 23 | 45 |
| Organic Fractionation and Purification (Half Day) | 88 | 92 | 180 |
| Organic Fractionation and Purification (Full Day) | 177 | 184 | 360 |
| Complex Purification and Natural Extracts | 66 | 69 | 135 |
| Flash Method Development & Scale-Up | 110 | 115 | 225 |

## Application Notes and Consumables Charging Criteria

1. **1. Consumables: the fee covers the instrument depreciation allowance, maintenance, and technical support. Disposable purification columns (e.g., Biotage® Sfär) and mobile-phase solvents are not included and are payable by the user/client.**
2. **2. ELSD Detection (if applicable): for compounds without a chromophore (e.g., sugars, lipids, steroids) requiring an additional evaporative light-scattering detector (ELSD), a minimum additional conditioning time of one hour applies to account for nebulization gas consumption and signal calibration.**
3. **3. Calculation of User Fees:**
    - **ALIFAR and other UniPR internal users: hourly charges based on actual instrument usage time.**

- **External users: charges per individual test/service, calculated for analysis performed in triplicate and including the hourly cost of technical staff.**

**ALIFAR users who contribute their research funds to preventive maintenance contracts and/or annual full-risk insurance coverage, or to repair costs, will not be charged until the amount contributed has been offset.**

## Annex 1. BIOTAGE® SELEKT AUTOMATED FLASH CHROMATOGRAPHY SYSTEM WITH UV-VIS DETECTOR – PURIFICATION REQUEST FORM

**to be sent by email to authorized personnel**

### Applicant details

| **INTERNAL USER – UNIVERSITY OF PARMA** |
|---|
| Department/Centre: |
| Applicant: |
| Operator: |
| E-mail: |
| Phone: |

| **EXTERNAL USER** |
|---|
| Company/Organization name: |
| VAT/Tax ID: |
| Address: |
| Applicant: |
| Operator: |
| E-mail: |
| Phone: |

## Sample information and type of analysis

| Parameter / Field | Options and Details to Select / Complete |
|---|---|
| **Purpose of analysis** | ☐ Main peak isolation<br>☐ Fractionation of crude synthetic product<br>☐ Purification of natural products / extracts<br>☐ Trace component enrichment |
| **Number of samples / crude products to load** | |
| **Estimated total sample mass (mg/g)** | |
| **Confirmed solubility in** | ☐ Methanol (MeOH)<br>☐ **Acetonitrile (MeCN)**<br>☐ Dichloromethane (DCM)<br>☐ Ethyl acetate (EtOAc)<br>☐ **DMSO**<br>☐ Other: _____ |
| **Estimated maximum dissolution volume** | _____ **mL** |
| **Recommended/preferred loading method** | ☐ Liquid loading (Liquid Loading)<br>☐ Dry loading (Dry Load on silica/Celite) |
| **Thermal and chemical stability of the sample** | ☐ Stable at room temperature<br>☐ Photosensitive<br>☐ Thermolabile (Requires storage at 4 °C) |
| **Known absorption wavelength (nm)** | **Max UV: _____ nm**<br>☐ No chromophore (Requires ELSD detector) |
| **Known initial analytical conditions (if available)** | **TLC: _____ in eluent: _____** $R_f$<br>**HPLC / LC-MS: Column used _____**<br>**Recommended gradients/mobile phases:**<br>_____ |
| **Particulates present / Filtration performed** | ☐ YES (Filtered a 0.45 µm / 0.22 µm)<br>☐ NO (Requires prior filtration before injection) |

| Parameter / Field | Options and Details to Select / Complete |
|---|---|
| **Sample hazards (SDS)** | ☐ Flammable<br>☐ Irritant<br>☐ Toxic<br>☐ Corrosive<br>☐ Hazardous to the environment<br>☐ No known hazards |

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

**Failure to use the service without cancellation by the deadline will result in the service being charged.**

Date ……..

Applicant's signature (holder of the funds)

……

**Annex 2. List of personnel authorized to use the equipment**

| ***Staff members and trainers*** | | | |
|---|---|---|---|
| **Surname** | **First name** | **Department/Centre** | **Contact** |
| Radi | Marco | Food and Drug Sciences | marco.radi@unipr.it |
| Costantino | Gabriele | Food and Drug Sciences | gabriele.costantino@unipr.it |
| Pieroni | Marco | Food and Drug Sciences | marco.pieroni@unipr.it |
| Biagi | Marco | Food and Drug Sciences | marco.biagi@unipr.it |
| Annunziato | Giannamaria | Food and Drug Sciences | giannamaria.annunziato@unipr.it |
| De Paolis | Marco | Food and Drug Sciences | marco.depaolis@unipr.it |
| ***Authorized staff members*** | | | |
| **Surname** | **First name** | **Department/Centre** | **Contact** |
| Martina | Maria Grazia | Food and Drug Sciences | mariagrazia.martina@unipr.it |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| ***Equipment users*** | | | |
| **Surname** | **First name** | **Department/Centre** | **Contact** |
| Valenti | Martina | Food and Drug Sciences | martinaeleonora.valenti@unipr.it |
| AL DUGOM | Ibrahim | Food and Drug Sciences | ibrahim.aldugom@unipr.it |
| Francesca | Malagutti | Food and Drug Sciences | Francesca.malagutti@unipr.it |
| | | | |
| | | | |
| | | | |