

User Rules & Regulations

Core Facility for Mass Spectrometry and Proteomics (CFMP)

at the Center for Molecular Biology of Heidelberg University (ZMBH)

Last updated on the 12th of December 2024

§1 Definition and aims

1. The Core Facility for Mass Spectrometry and Proteomics (CFMP) is an infrastructure facility of the Center for Molecular Biology of Heidelberg University (ZMBH). This central service facility supports the research scientists of the FoF1 / Heidelberg and Mannheim Life Sciences campus with high-performance mass spectrometry aimed at protein analytics and proteomics.
2. The user rules & regulations stated in this document regulate the organization of service and method development at the CFMP. They are mandatory for every core facility user.
3. The core facility user is provided with an electronic copy of the User Rules & Regulations, including transparent fees for the services provided by the CFMP. Core facility user, before the use of CFMP instruments and services has to sign an individual agreement confirming that the Core facility user is familiar with the User Rules & Regulations and Service & Pricing List.
4. User Rules & Regulations and Service & Pricing List are following the requirements of the Deutsche Forschungsgemeinschaft (DFG) and Cellnetworks Core Technology Platform (CTTP). For the matters not mentioned in these User Rules & Regulations general rules for the Core Facilities of the Heidelberg University are applied.
5. The CFMP is registered in the research infrastructure database of the German Research Foundation (DFG) with the following reference number: RI_00574.

§2 Responsibilities of the central service facility

1. The services of the CFMP include the consultation of scientific projects, sample preparation & processing, and the mass spectrometry-based protein analysis as well as the primary analysis of experimental data.
2. All services offered by the CFMP are conducted by experienced personnel of the central service facility (full service). These services are listed in the currently valid Service & Pricing List.

§3 Organization

1. The CFMP is managed by the core facility head.
2. The core facility head is accountable to the Scientific Advisory Board as well as the directorate of the ZMBH.
3. The research group leaders of the ZMBH appoint a scientific coordinator and pass the user rules & regulations of the CFMP.
4. The work of the CFMP is being followed by the Scientific Advisory Board (§4), under the supervision of the scientific coordinator (§5).
5. The name of the facility head and the scientific coordinator is published online on the website of CFMP.

§4 Scientific Advisory Board

The Scientific Advisory Board supervises the activities of the CFMP to achieve optimal integration of the central service facility into the research environment at the FoF1 / Heidelberg and Mannheim Life Sciences campus. The scientific coordinator heads the commission.

The Scientific Advisory Board consists of:

- a) The scientific coordinator
- b) The representative of ZMBH
- c) Two representatives of the external institutes

The Scientific Advisory Board meets at regular intervals to discuss issues concerning the CFMP and to take note of the head's statement of accounts. Alternatively, this can also be handled using a circular resolution. The Scientific Advisory Board determines its orders of conduct. The names of the Steering Committee members are published on the website of CFMP.

§5 Scientific coordination

The responsibilities of the scientific coordinator are:

Representing and communicating the needs of the ZMBH and CFMP users to the core facility head.

- a) Role of competent and approachable contact for the core facility head in all matters

needed for optimal integration of the CFMP into the research environment at the campus Heidelberg.

- b) Distributing invitations to regular Scientific Advisory Board meetings as well as irregular ones that require immediate attention.
- c) Prioritizing the order of sample processing in times of high demand or in urgent cases.

§6 Provided services

1. The services offered by the central service facility are regularly updated and adapted to the users' needs. The core services are described in the current Service & Pricing List. They include the following:
 - a) Consulting services
 - b) Designing experiments
 - c) Preparing samples
 - d) Analyzing peptide or protein mixtures using appropriate LC-MS instruments
 - e) Processing the data acquired using LC-MS
2. The central service facility recommends its users get in contact as soon as possible to avoid the occurrence of errors during experimental design or sample preparation. A detailed experiment consultation precedes any service or project requests, in which a suitable analytical strategy is agreed upon with the user, and the estimated costs of the measurements based on the Service & Pricing List are explained to the customer. The user agrees to cover any resulting costs before the measurements are being conducted.
3. The head of the core facility or his/her representative is responsible for scheduling services and projects. Regular services (as listed in the Service & Pricing List) are processed on a first-come, first-served basis. In justified cases, such as the optimization of instrument usage or ensuring the reproducibility of serial measurements, exceptions can be made, and the core facility staff may determine a different scheduling order. Additional services are provided in a manner that ensures optimal utilization of instruments and the working time of CFMP staff. Peptide and protein samples ready for analysis using the LC-MS instrument are queued on the list of samples scheduled for LC-MS analysis. In cases of uncertainty, the scientific coordinator has the authority to make decisions.
4. The head of the core facility or his/her representative reserves the right to reject requests for the provision of services in objectively justified cases. In the event of a refusal, constructive feedback will be sent to the requester. The scientific coordinator must be notified about such a rejection too.

§7 Sample submission

1. All samples must be electronically registered under a unique and continuous identification number by the members of the CFMP.
2. Upon prior agreement, samples can be submitted to the ZMBH's CFMP according to the guidelines available on the website of the CFMP. Toxic or human pathogenic as well as radioactive samples cannot be processed. Only samples in the form of precipitated proteins or peptides, proteins, and peptides in solution, and proteins immobilized on an SDS page are accepted.
3. Remaining samples continue to be the property and responsibility of the users. Since the service unit has only limited possibilities for refrigerated storage of samples, a medium or long-term storage of sample sets is not possible. Therefore, no guarantee can be given for the integrity of samples beyond the immediate period of the service (1 month).

§8 Costs

A service includes the routine processing of samples, the sample preparation steps as specified in the Service & Pricing List, and an initial data analysis. The fees charged, as determined by the FGL assembly, are also detailed in that list. Collaborations (without the fixed fees) must be stipulated before the commencement of work. They are limited to projects used for method development and are generally financed through joint third-party funding. Service projects have priority over collaborations. In cases, where the intellectual contribution of one or more employees of the CFMP exceeds the technical provision of a service should be honored by a co-authorship.

§9 Data storage & security

1. The analysis results are being made available to the respective members of the research groups in adequate form (e.g.: e-mail, iLab, heiBOX).
2. All measured data (spectra and database search results) obtained during routine operations are to be stored on a server. On request, they will be made available to the respective

members of the research groups in a suitable way.

3. Archiving of obtained data is carried out in cooperation with the university data center (Universitätsrechenzentrum). Data are to be stored for a minimum of 10 years.

§10 Publication of data

1. CFMP at ZMBH follows publication policy published online by the CellNetworks Core Technology Platform of Heidelberg University.
2. Acknowledgment: In principle, contracted services, as provided by a central service facility are to be indicated in scientific publications at the appropriate position. A compensation of costs for services provided does not replace a corresponding quotation in scientific publications. More specifically, any work that originated in a service facility must be clearly identified and cited in the acknowledgments of scientific publications.

An example:

We acknowledge the technical support of Core Facility for Mass Spectrometry and Proteomics of Center for Molecular Biology (ZMBH) of Heidelberg University. We thank xxxxxxxx for support with mass spectrometry analysis. Core Facility for Mass Spectrometry and Proteomics is funded by the ZMBH and partially funded by the CellNetworks Core Technology Platform (CCTP) of Heidelberg University. The CCTP is funded in part by the Federal Ministry of Education and Research (BMBF) and the Ministry of Science Baden Württemberg within the framework of the Excellence Strategy of the Federal and State Governments of Germany.

3. Co-authorship: If new analytical methods are developed or service facility employees make significant intellectual contributions to experiment design or data generation/evaluation, users are obligated to include these employees as co-authors in publications or patents. This commitment follows good scientific practice, irrespective of whether the technical service incurred charges. Intellectual ownership and contributions must ideally be discussed and agreed upon mutually before services are rendered.
Examples of intellectual contributions include:
 - Differential analysis elucidating up- and down-regulated proteins
 - Identification and correction of major mistakes in experimental design, such as the absence of proper controls
 - Assistance in designing and generating figures, supplementary tables, and data deposition to proteomic repositories (e.g., PRIDE)
 - Support with data analysis, software instruction, and discussion of the analytical pipeline through a series of meetings

§11 Type of use

1. The employees of the Core Facility are tasked with carrying out the work.
2. Within the context of the internal use, the CFMP provides services to the university member.
3. For domestic external public users, the use can take place in the context of a non-economic activity within the meaning of No. 2.1.2 of the Union Framework for State Aid for the Promotion of Research, Development, and Innovation (2014/C 198/01) and not in the context of contract research or services for companies or other activities within the meaning of economic activity (§ 9 (4) Framework Use Regulations for Core Facilities at Heidelberg University) (**cooperation**).
4. Alternatively, for domestic external public users, the CFMP can provide services in the context of economic activity (**contract research**).
5. For domestic private, foreign public, and private users the CFMP can provide services in the form of a **cooperation** between the user and the University of Heidelberg or in the form of **contract research**.

Service & Pricing List

Core Facility for Mass Spectrometry and Proteomics (CFMP)

at the Center for Molecular Biology of Heidelberg University (ZMBH)

Updated on the 12th of December 2024

The CFMP provides regular and additional services, which are listed on the main website of CFMP. The services offered to the users of the CFMP are adjusted to the constantly changing needs of the research groups of the Heidelberg and Mannheim Life Sciences campuses. All prices listed below are in Euro (€) and do not contain VAT.

Category	Procedure	Internal price [€]
LC-MS analysis	70 min	55
	105 min	70
	165 min	100
	Intact protein mass determination	75
Consumables	Pre-Cast Gel & Run (SDS-PAGE)	40
	Trypsin (20µg)	35
	LysC (20µg)	240
	H-Arginine (aliquot of 60.7 mg that can be used to prepare 0.5 L cell culture medium)	520/80
	H-Lysine (aliquot of 93.1 mg that can be used to prepare 0.5 L cell culture medium)	420/120
Services	In-solution digest and desalting (up to 100 µg, e.g. for TMT labeling)	50
	In-solution digest and desalting (up to 500 µg, e.g. for phosphoenrichment)	100
	In-solution digest and desalting (up to 1000 µg, e.g. in combination with PTMscan kits)	150
	In-gel digest setup (up to 10 samples)	75
	SP3 digest and desalting (1 - 20µg)	40
	Dimethyl labeling (up to 10 samples)	50
	TMT 6plex (per replicate)	150
	TMT 10/11 plex (per replicate)	240
	Phosphopeptide enrichment (up to 500 µg starting material)	25
	Protein concentration measurement (up to 10 samples)	100

Additional fees are applied for the non-internal users as specified in the table below:

Type of Service	Cooperation ¹ and contract research	Non-economic activity (cooperation)	Cooperation ¹	Contract research
User	Internal user ²	External domestic public users	External domestic private and foreign private and public users	External domestic private and public and foreign private and public users
	Use-related material expenses (DFG-compatible, e.g. DFG lump sum)	Use-related material expenses (DFG-compatible, e.g. DFG lump sum)	Use-related material expenses (DFG-compatible, e.g. DFG lump sum)	Calculated individual full costs (without depreciation)
Sum	€	€	€	
plus:				
Overhead 25 %	-	-	Applies €	-
Overhead 60 %	-	-	-	Applies €
Profit markup 5%	-	-	-	Applies €
VAT owed	-	Applies €	Applies €	Applies €

¹ A cooperation always involves a significant scientific contribution and development effort by the staff of the Core Facility to solve a specific scientific problem.

² Internal users are all members of Heidelberg University

Specification of procedures:

Pre-Cast Gel & Run (SDS-PAGE)

The sample is being delivered in the form of a protein solution in SDS-sample buffer: This service includes protein electrophoresis using a commercial mini gel. The length of separation is based on the prior agreement. Gel staining is achieved using a commercial colloidal Coomassie solution (3 h), de-staining using water (overnight).

In-Solution protein digest + peptide purification

A first digestion is performed with Lys-C in the presence of 8 M urea, followed by a trypsin digestion after dilution to 2 M urea. Peptides are enriched by solid-phase extraction and are taken up in appropriate solutions for nanoHPLC-MS analysis. The additional fee is charged due to of the high amount of trypsin and Lys-C used compared to In-Gel digestion.

In-Gel protein digest

A polyacrylamide gel is delivered after Coomassie staining. The service includes excision of the bands / spots from the gel, reduction and alkylation of cysteines and subsequent tryptic digestion. The service fee includes a project specific time needed to set-up the digest.

SP3 digest + peptide desalting

In this procedure, proteins are bound to hydrophilic beads and rinsed with various organic-solvent-based mixtures. The SP3 procedure allows for the processing of small amounts of proteins (10 µg) contaminated with detergents or chaotropic reagents. After rinsing, proteins are digested with Trypsin in a water-based buffer and next desalted using self-made stage tip.

Dimethyl labeling

After digestion with proteolytic enzyme(s) the peptide solution is treated with the appropriate reagents. Following removal of the excess reagents, the standard LC-MS analysis is carried out as described under "LC-MS/MS analysis"

TMT labeling

After digestion with proteolytic enzyme(s) the peptide solution is treated with the appropriate reagents. Following quenching and removal of the excess reagents, the peptides are fractionated using high-pH reversed phase chromatography. Eight standard LC-MS analysis is carried out as described under "LC-MS/MS analysis"

Phosphopeptide enrichment

After digestion with proteolytic enzyme(s) the phosphopeptides are enriched using Fe-NTA MagBeads. Next, the whole proteome and fraction enriched for phosphorylated peptides are analyzed. Standard LC-MS analysis is carried out as described under "LC-MS/MS analysis"

LC-MS/MS analysis

The prices are determined based on the total instrument time required, which includes sample loading on the column, chromatographic peptide separation, MS/MS analysis, and equilibration of HPLC for the next sample. The cost is calculated using a DFG-reimbursable flat fee of 25 Euros per hour of instrument time. Additionally, a flat rate of 25 Euros per sample is added to account for bioinformatic analysis needed for peptide identification and quantification.

The peptide sample is loaded directly onto the separation column for best possible performance and is, depending on the complexity of the sample, eluted with an appropriate acetonitrile gradient. The analysis is carried out using a mass spectrometer of the highest performance class. The following systems are available:

- Ultimate RCLC 3000 ESI QExactive HF
- nanoAcquity ESI QTrap5500
- Vanquish Neo Orbitrap Eclipse with ETD

A first automated data analysis is carried out using suitable software (MaxQuant, Proteome Discoverer, Scaffold). Depending on the software, the results of the database search are provided in user-friendly form. The data files are stored in two independent folders for at least 10 years at the data center of Heidelberg University.

Intact protein mass determination

The intact mass of a protein is determined using Q-TOF mass spectrometer after an online desalting by HPLC. Protein spectra are then deconvoluted using the MaxEnt algorithm implemented in the Compass DataAnalysis 4.2 software (Bruker).



ZMBH Zentrum für Molekulare Biologie der Universität Heidelberg

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Core Facility for Mass Spectrometry and Proteomics
Center for Molecular Biology of Heidelberg University

Individual User Agreement for the Core Facility for Mass Spectrometry and Proteomics

This User Agreement is entered into between the Core Facility for Mass Spectrometry and Proteomics at the Center for Molecular Biology of Heidelberg University, hereinafter referred to as CFMP, and the undersigned user, hereinafter referred to as the "User."

Terms and Conditions:

1. The User acknowledges having received, read and understood the **User Rules and Regulations provided by the CFMP**, as well as the **User Regulations for Core Facilities at Heidelberg University**, which came into force on the 5th of December 2023. By agreeing to this User Agreement, the User agrees to abide by the rules and regulations outlined in the aforementioned documents.
2. The User acknowledges having received, read, and understood the **Service and Price List provided by the CFMP**. By agreeing to this User Agreement, the User agrees to comply with the terms and pricing specified in the aforementioned document.
3. The User agrees to follow the recommendations, guidelines, and any other instructions provided in the **User Rules and Regulations and the Service and Price List** to ensure proper use of the CFMP services.
4. Upon the signing of this Agreement, the CFMP shall provide the User with access to the services outlined in the **Service and Price List**, subject to the terms and conditions specified therein.
5. The User acknowledges that the most up-to-date version of the **User Rules and Regulations** together with the **Service and Price List** is available on the website of the CFMP.

In addition, the following is agreed:

6. Type of Use

a) Own Use/Commissioning

- o The Core Facility shall be used by the User itself
- o Employees of the Core Facility are commissioned to carry out the work.

b) Internal use

- o The use is carried out within the framework of internal use by a member of the university.

c) Commercial/non-commercial activity, cooperation, contract research

I. for domestic external public users

- o The use takes place within the framework of a non-economic activity within the meaning of No. 2.1.2 of the Community Framework for State Aid for Research, Development, and Innovation (2014/C 198/01) and not within the framework of contract research or services for companies or other activities within the meaning of an economic activity (§ 9 (4) of the Framework Utilisation Regulations for Core Facilities of the University of Heidelberg) (**cooperation**).
- o The use takes place within the framework of a commercial activity (**contract research**).

II. for domestic private and foreign public and private users

- o The use is within the framework of **cooperation** with the University of Heidelberg.
- o The use takes place within the framework of **contract research**.

7. The User acknowledges that the total cost of the project and, therefore, the service fee is calculated using the online booking system Agilent CrossLab (iLab Operations Software). The agreed fees follow the **Service and Price List** of the Core Facility for Mass Spectrometry and Proteomics (CFMP) at the Center for Molecular Biology of the Heidelberg University (ZMBH).

Filled by the user:

User Name	Date	Signature

Institute/University Name	Address	Title and the full name of the group leader (for billing)

Filled by the CFMP Head:

CFMP Head	Date	Signature
Marcin Luzarowski		