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## Activity

**The Institut Curie Mass Spectrometry and Proteomics facility (LSMP) was established in 2001 to answer a request in proteomics. This service consists of personnel with specialized know-how and expertise in the proteomics field as well as state-of-the-art proteomics equipment (MS, LC, softwares, etc..).**

New collaborators are met to discuss the most appropriate way forward in their project. Altogether, we design the experiment so as to answer their questions. Some biological and biomedical questions will apply existing technologies. Others are technically more challenging and require the development of new techniques, reagents or software in order to solve pressing problems.

## Aims

The LSMP facility aims to provide researchers with technical services enabling them to analyze proteins (identification of proteins, comparison of proteomes, analysis of post-translational modifications, identification of partners interacting with the protein of interest etc.) by mass spectrometry. One of the most promising approaches is combining qualitative and quantitative analysis in a single analytical run (adapted to research samples, which means high sensitivity and low-level quantitation). The goal is to provide our collaborators with scientific hypotheses more quickly and to functionally validate our quantified candidates.

## Networking

The LSMP facility is an "Ile-de-France Proteomics facility" for cancer research labeled IBiSA, which is part of the " Proteomics @ PSL Research University " Montagne Sainte Geneviève Proteomic Facility. The LSMP is a founding member of Paris proteomics platforms network, is

associated to the French Society for electrophoresis and proteomic analysis and to the French Society of Mass Spectrometry part of EuPA and HUPO.

## Services

In practical terms, the facility carries out two distinct modes: collaborative or service. Fees are billed on an hourly basis for instruments usage.

- Collaborative research requires advanced experiments by working closely in a true collaborative effort: a person of the research team is trained at the facility to prepare the samples and to interpret the data. The fees stand for machines maintenance contracts and consumables. Institut Curie subsidizes the rest.
- Service: on each project, a service mode can be chosen if the co-signature is not wished. The analysis fees include people salary, structure costs and investments renewal.

The services provided:

- Definition of optimal experimental design
- Advice concerning the setting up
- Advice and assistance in preparation of samples/quality control
- Protein and peptide identification
- Comparison of proteomes
- Accurate mass measurements
- Analysis of post-translational modifications (localization and characterization).
- Targeted proteomics
- Quantitative proteomics
- MS processing
- Bioinformatics and statistical analysis

## Equipment

- Thermo Scientific™ Q Exactive™ HF-X Hybrid Quadrupole-Orbitrap™ MS
- Thermo Scientific™ Orbitrap Fusion™ Tribrid™ MS
- Thermo Scientific™ Ultimate™ 3000 RSLCnano LC system
- Thermo Scientific™ Dionex™ Ultimate™ 3000 AFC Automated Fraction collector
- AB SCIEX™ 4800 Plus MALDI TOF/TOF™ MS (warranty expired in 2018)
- Dionex/LC-Packings Probot™ Micro Fraction Collector
- Agilent 3100 OFFGEL Fractionator
- [myProMS web server](#)

- Thermo Scientific™ Proteome Discoverer™ 2.2 software
- Database search algorithms (SEQUEST HT, Matrix Science Mascot Server and Daemon 2.5, ...)
- [Trans-Proteomic Pipeline \(TPP 4.8\) tools](#)

## Training and methodological expertise

The LSMP Facility aims at providing to its users three types of expertise: 1-personalized training to realize a part of analyses; 2-advanced training about all aspects of Proteomics (from helping in defining questions and experimental design, to sample preparation, through MS analysis, to MS processing and analysis); 3-development of MS processing and analysis tools.

The LSMP develops in-house solutions, in collaboration with the [Bioinformatics platform \(U900\)](#), to provide the community with bioinformatical tools for management, mining, curation or mass spectrometry-based (MS) data sharing. The web server *myProMS* was designed to handle projects and curate databank-search results from multiple MS runs while optimizing data sharing between users with complementary competences. It is improved continuously so as to be up-to-date with the quality standards. *myProMS* is a freely distributed tool, GPL license, already implemented in 4 institutes (ESPCI, Institut Cochin, IGF de Montpellier and IC).

## Manager and Team

The LSMP facility is managed by Damarys Loew and has a team specialized in the field of 1) Mass spectrometry and proteomics 2) Biology and 3) Bioinformatics

- Dr Damarys Loew, mass spectrometry specialist and facility manager contact: Tél. : +33 (0)1 56 24 65 22 ([spectro@curie.fr](mailto:spectro@curie.fr))
- Bérangère Lombard, MS engineer
- Florent Dingli, Proteomic engineer
- Guillaume Arras, Bioinformatic engineer
- Vanessa Masson, Biology engineer

## Key publications

### Year of publication 2018

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Żylicz Jan Jakub, Bousard Aurélie, Žumer Kristina, Dossin François, Mohammad Eusra, Teixeira da Rocha Simão, Schwalb Björn, Syx Laurène, Dingli Florent, Loew Damarys, Cramer Patrick, Heard Edith (2018 Dec 21)

**The Implication of Early Chromatin Changes in X Chromosome Inactivation**

*Cell* : 176 : 1-16 : [DOI : 10.1016/j.cell.2018.11.041](https://doi.org/10.1016/j.cell.2018.11.041)

Elie Hatem, Sandy Azzi, Nadine El Banna, Tiantian He, Amélie Heneman-Masurel, Laurence Vernis, Dorothee Baille, Vanessa Masson, Florent Dingli, Damarys Loew, Bruno Azzarone, Pierre Eid, Giuseppe Baldacci, Meng-Er Huang (2018 Nov 20)

**Auranofin/Vitamin C: A Novel Drug Combination Targeting Triple-Negative Breast Cancer.**

*Journal of the National Cancer Institute* : [DOI : 10.1093/ije/djy149](https://doi.org/10.1093/ije/djy149)

Forget Antoine, Martignetti Loredana, Puget Stéphanie, Calzone Laurence, Brabetz Sebastian, Picard Daniel, Montagud Arnau, Liva Stéphane, Sta Alexandre, Dingli Florent, Arras Guillaume, Rivera Jaime, Loew Damarys, Besnard Aurore, Lacombe Joëlle, Pagès Mélanie, Varlet Pascale, Dufour Christelle, Yu Hua, L. Mercier Audrey, Indersie Emilie, Chivet Anaïs, Leboucher Sophie, Sieber Laura, Beccaria Kevin, Gombert Michael, D. Meyer Frauke, Qin Nan, Bartl Jasmin, Chavez Lukas, Okonechnikov Konstantin, Sharma Tanvi, Thatikonda Venu, Bourdeaut Franck, Pouponnot Celio, Ramaswamy Vijay, Korshunov Andrey, Borkhardt Arndt, Reifenberger Guido, Pouillet Patrick, D. Taylor Michael, Kool Marcel, M. Pfister Stefan, Kawauchi Daisuke, Barillot Emmanuel, Remke Marc, Ayrault Olivier (2018 Sep 10)

**Aberrant ERBB4-SRC Signaling as a Hallmark of Group 4 Medulloblastoma Revealed by Integrative Phosphoproteomic Profiling**

*Cancer Cell* : 34 : 379-395 : [DOI : 10.1016/j.ccell.2018.08.002](https://doi.org/10.1016/j.ccell.2018.08.002)

### Year of publication 2017

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Alexandros Glentis, Philipp Oertle, Pascale Mariani, Aleksandra Chikina, Fatima El Marjou, Youmna Attieh, Francois Zaccarini, Marick Lae, Damarys Loew, Florent Dingli, Philemon Sirven, Marie Schoumacher, Basile G Gurchenkov, Marija Plodinec, Danijela Matic Vignjevic (2017 Oct 15)

**Cancer-associated fibroblasts induce metalloprotease-independent cancer cell invasion of the basement membrane.**

*Nature communications* : 924 : [DOI : 10.1038/s41467-017-00985-8](https://doi.org/10.1038/s41467-017-00985-8)



Gheghiani Lilia , Loew Damarys, Lombard Bérangère, Mansfeld Jörg, Gavet Olivier (2017 Jun 6)

**PLK1 Activation in Late G2 Sets Up Commitment to Mitosis**

*Cell Reports* : 19 : 2060-2073 : [DOI : 10.1016/j.celrep.2017.05.031](https://doi.org/10.1016/j.celrep.2017.05.031)

Guillaume Kellermann, Florent Dingli, Vanessa Masson, Daniel Dauzonne, Evelyne Ségal-Bendirdjian, Marie-Paule Teulade-Fichou, Damarys Loew, Sophie Bombard (2017 Mar 1)

**Exploring the mechanism of inhibition of human telomerase by cysteine-reactive compounds.**

*FEBS letters* : 591 : 863-874 : [DOI : 10.1002/1873-3468.12589](https://doi.org/10.1002/1873-3468.12589)