



TopSpec - 829157

WP1 – Omnitrap and IMS Development and Testing

Deliverable: D1.3 Fully serviced, functioning Omnitrap & IMS

Task: Maintenance and servicing in situ will be performed at both locations to ensure fault-free performance. Includes, clean-up, consumable replacement and other preventive maintenance during the course of this project.

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Deadline: 11/30/2022

1. Service agreement - Fasmatech and MS Vision

Partner service agreement: **Fasmatech** and **MSVision** have entered into an agreement for servicing Omnitrap systems in the field. Engineers from MSVision were trained in Athens over a period of two weeks, working closely with Fasmatech personnel on assembling and disassembling the omnitrapp, cleaning parts and installing the system on Q Exactive and Exploris Orbitrap mass spectrometers.

2. Service action - Institut Pasteur (IP)

The first Omnitrap was installed at IP on March 2022. The system has been operated successfully for a period of 6 months. Throughout this period the Omnitrap was deployed for the analysis of light chain antibody species on LC time scales with remarkable success. Both MS2 and MS3 modes were utilized involving EID and ECD fragmentation. ExD reactions became less efficient at the end of this 6 month period (March – September 2022), which was an indication that the Omnitrap must be cleaned.

In September 2022, MSVision engineers provided their services to IP, reinstating instrument performance. **Figure 1** shows the Field Service activities offered by MSVision in collaboration with Fasmatech (online support).

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MSVision 
Dedicated to Mass Spectrometry

Customer	Institut Pasteur	Customer contact	Virginie Portelette
Account number	350387	Phone	+33 145 68 85 70
Engineer	Alex Langlands	Visit date	6-9-2022 09:30:00 7-9-2022 15:20:00

Job description Clean + replace part - 05129L Q-Exactive HF

Number	Description	Quantity
03	Contract labour half day	3
62	Contract lodging per night	1
34	Contract travel over 150km	1
9998	filament disk cathode 58-000260	1
9998	Filament cover	1

Remarks

6th Sept 2022.

Pre tests done by remote before visit showing quad is clean.

Vented system and replaced the filament on the electron gun and cleaned the lenses.

Installed screen upgrade to the electron gun and re installed.

Removed the end cap and checked the rods on the omnitrapp. Looked clean so have a wipe with acetone using a long rod and lint free wipes and put end cap back.

Cleaned front end of QE and pumped system down and ran a back out overnight.

7th sept 2022.

Bake out ran ok, calibrated QE in pos and neg with no issues.

Ran transmission checks and trapping tests of Omnitrap which all passed ok.

System is ok to use.

Signature



Tingting Fu

Figure 1. Field service activities provided by MSVision in collaboration with Fasmatech to reinstate the performance of the omnitrapp platform installed at Institut Pasteur.

3. Service on site approach - Institut Pasteur (PI)

Field-Service included a series of pre-tests to evaluate the performance of the instrument prior to cleaning. Then the system was vented and the electron source removed. All electrodes were then polished /cleaned and the filament was replaced. A new mask for collecting stray electrons was also installed to minimize surface charging effects. The diffraction pattern caused by the electron beam and the serviced electron are shown in **Figure 2**. The emission current specs were met after assembling and testing the system. In addition, the omnitrapp was cleaned through the back window-flange using lint-free material, solvents and high purity nitrogen gas for dusting off surfaces. A final series of experiments were performed with online support from Fasmatech to match performance tests set out on the installation specification sheet, which include obtaining complete sequence coverage in top down experiments with ubiquitin by EID and ECD using <100 ms reactions.

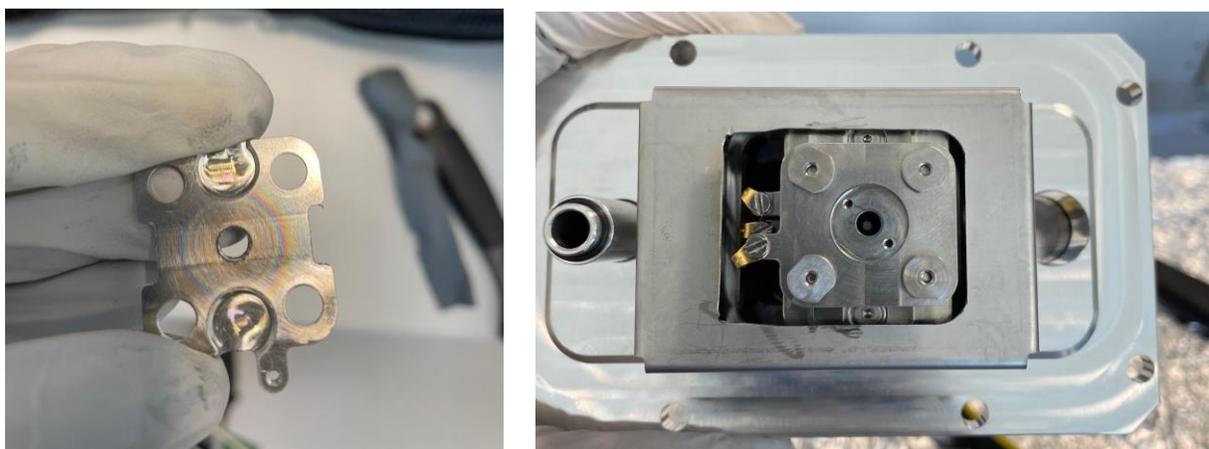


Figure 2. Diffraction patterns produced on the surface of lens-electrodes by the electron beam and the assembled electron source with the additional mask to minimize surface charging.

4. Service action - Karolinska Institutet

The omnitrapp platform coupled to the ion mobility spectrometer installed at Karolinska Institutet in early October is now operational. Personnel from KI also received training in Athens, working closely with Fasmatech personnel on operating and servicing the omnitrapp. The service activities will continue beyond the end of the TopSpec project, and the internal infrastructure of the consortium has been organized to enable seamless operation of the TopSpec platform in the future.

5. Software service - Fasmatech

In addition to the field-service activities, Fasmatech has been continuously improving the omnitrapp instrument control software, removing bugs and adding new functionality. The software upgrades will continue to take place beyond the TopSpec project and new versions will be made available to TopSpec users free of charge.