



# European Network of Fourier-Transform Ion-Cyclotron-Resonance Mass Spectrometry Centers

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**Deliverable D2.11 – Final report of the different short courses - Location: Lisbon**

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## Document Classification

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## Document Abstract

This deliverable is the final report of Short Course 6, an event organized and held within WP2 – NA-Training, education and networking activities.

The objective of WP2 is to promote education in the field of FT-ICR MS, sharing newly developed state-of-the-art procedures for experiments and data analysis and training qualified and highly skilled FT-ICR specialists. In addition, Short Course will include a number of social events creating a fruitful platform for beginning international collaborations.

This deliverable explains content and outcome of Short Course 6 (SC6) performed in the framework of the EU\_FT-ICR\_MS project.



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## 1. Introduction

Short Course 6, entitled « Mapping post-translational modifications through FT-ICR », was originally planned to be held at the Faculdade de Ciências -Universidade de Lisboa, Lisbon (Portugal) on 11-13 March 2020 (M27). Due to COVID19 pandemic restrictions, SC6 has been postponed to M45 (Sept 2021) and then to M46 (17-20 Oct 2021) due to COVID19 pandemic restrictions.

The first and second announcement flyers are presented below in Figures 1 and 2, respectively:

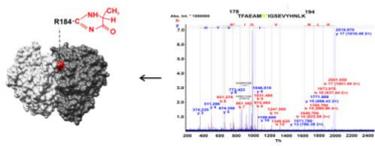
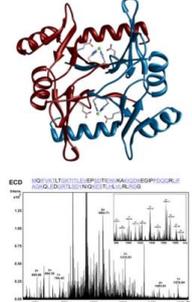
<p><b>EU FT-ICR MS</b> 6<sup>th</sup> Short Course</p> <p><b>Mapping post-translational modifications through FT-ICR</b></p>	<p><b>Course overview</b></p> <p>This course will cover the analysis and mapping of protein post-translational modifications using FT-ICR mass spectrometry</p>  <p>Specific topics include:</p> <ul style="list-style-type: none"> <li>Sample preparation</li> <li>Ionization</li> <li>Top-down MS</li> <li>Fragmentation methods</li> <li>Sequence analysis</li> </ul>	<p>Tutorial lectures Instrument demos Hands-on exercises Computational data analysis</p>  <p><b>Faculty</b></p> <ul style="list-style-type: none"> <li>Carlos CORDEIRO</li> <li>Peter O'CONNOR</li> <li>Petr NOVAK</li> <li>Roman ZUBAREV</li> </ul>
<p><b>Where and when</b></p> <p>LISBOA, 11 -13 March 2020</p> <p>Faculdade de Ciências Universidade de Lisboa, Portugal <a href="http://ciencias.ulisboa.pt">ciencias.ulisboa.pt</a></p>  <p><b>Contacts:</b> Carlos Cordeiro <a href="mailto:cacordeiro@fc.ul.pt">cacordeiro@fc.ul.pt</a></p> <p>Marta Sousa Silva <a href="mailto:mfsilva@fc.ul.pt">mfsilva@fc.ul.pt</a></p>	<p><b>NO PARTICIPATION FEE!</b> Travel, accommodation, meals and social program included</p> <p>Up to 10 applicants will be selected by the Scientific Committee</p>	<p><b>Application:</b> <a href="http://www.eu-fticr-ms.eu">www.eu-fticr-ms.eu</a></p> <p><b>DEADLINE FOR APPLICATIONS:</b> January 20<sup>th</sup> 2020</p>  <p>This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731077</p>

Figure 1. First flyer of SC6.



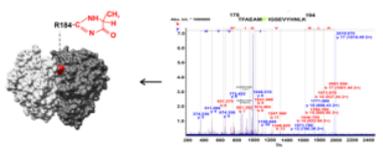
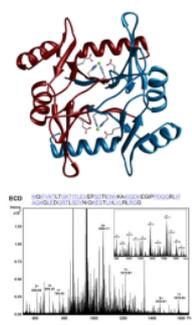
<p><b>EU FT-ICR MS</b> 6<sup>th</sup> Short Course</p> <p><b>Mapping post-translational modifications through FT-ICR</b></p>	<p><b>Course overview</b></p> <p>This course will cover the analysis and mapping of protein post-translational modifications using FT-ICR mass spectrometry</p>  <p>Specific topics include:</p> <ul style="list-style-type: none"> <li>Sample preparation</li> <li>Ionization</li> <li>Top-down MS</li> <li>Fragmentation methods</li> <li>Sequence analysis</li> </ul>	<p>Tutorial lectures Instrument demos Hands-on exercises Computational data analysis</p>  <p><b>Faculty</b></p> <ul style="list-style-type: none"> <li>Carlos CORDEIRO</li> <li>Peter O'CONNOR</li> <li>Petr NOVAK</li> <li>Roman ZUBAREV</li> </ul>
<p><b>Where and when</b></p> <p>LISBOA, 17 -20 October 2021</p> <p>Faculdade de Ciências Universidade de Lisboa, Portugal <a href="http://ciencias.ulisboa.pt">ciencias.ulisboa.pt</a></p>  <p><b>Contacts:</b> Carlos Cordeiro <a href="mailto:cacordeiro@fc.ul.pt">cacordeiro@fc.ul.pt</a></p> <p>Marta Sousa Silva <a href="mailto:mfsilva@fc.ul.pt">mfsilva@fc.ul.pt</a></p>	<p><b>NO PARTICIPATION FEE!</b> Travel, accommodation, meals and social program included</p> <p>Up to 10 applicants will be selected by the Scientific Committee</p>	<p><b>Application:</b> <a href="http://www.eu-fticr-ms.eu">www.eu-fticr-ms.eu</a></p> <p><b>DEADLINE FOR APPLICATIONS:</b> October 4<sup>th</sup> 2021</p>  <p>This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731077</p>

Figure 2. Second flyer of SC6.

## 2. Final report of SC6

SC6 was organized and held at Faculdade de Ciências, Universidade de Lisboa (FC-LISB), Lisboa (Portugal) on from 8 to 20 of October 2021 (M46). This course was focused on the analysis of post-translational modifications through FT-ICR, covering fundamentals of protein analysis by FT-ICR, sample preparation, ionization and fragmentation methods, PTM analysis and mapping. The sessions included tutorial lectures (in the morning), instrument demos, hands-on exercises, computer lab, and data analysis and interpretation using different software packages (in the afternoon), (Figure 3).

Tutorial lectures were held by Carlos Cordeiro (FCUL - Universidade de Lisboa), Petr Novak (Institute of Microbiology, BioCeV, Prague), Peter O'Connor (University of Warwick), Roman Zubarev (Karolinska Institutet, Stockholm), and the invited lecturer (remotely) Christopher Wootton (Bruker Daltonics). Instrument demos and hands-on exercises were done by Carlos Cordeiro



(Universidade de Lisboa) and Petr Novak (Institute of Microbiology, BioCeV, Prague), co-assisted by Marta Sousa Silva and Rodrigo Osawa, both from FCUL - Universidade de Lisboa.

	Monday 18 <sup>th</sup> October	Tuesday 19 <sup>th</sup> October	Wednesday 20 <sup>th</sup> October
09:30	Registration and presentation	2DMS	Beyond the limits of FT-ICR
10:00	FT-ICR: An introduction		
11:00	<i>Morning Break</i>	<i>Morning Break</i>	<i>Morning Break</i>
11:15	Sample preparation for protein MS	Protein mapping	The colours of extreme resolution MS
13:00	<i>Lunch</i>	<i>Lunch</i>	<i>Farewell</i>
14:00	Lab practice	Lab practice	
15:00			
16:00	<i>Afternoon Break</i>	<i>Afternoon Break</i>	
16:15	Lab practice	Data Analysis	
17:30	<i>City Museum guided tour</i>		
18:30	<i>Welcome cocktail</i>		

**Figure 3.** SC6 schedule.

Due to the COVID-19 pandemic, this course was organized in a combined mode of presential and remote access, being the presence limited to 12 students. Students that had been previously accepted in the course to take place in 2020 were contacted and were given priority in the new registration process. Theoretical tutorial lectures were accessible to all students (in the morning) and hand-on MS analysis only delivered presential (in the afternoon).

The course had 12 on-site participants (with a M/F ratio of 6/6) and 10 remote attendees (M/F ratio of 5/5), all of them with experience in mass-spectrometry and some with experience in FT-ICR-MS. Participants (presential and remote) came from 8 different European countries: Belgium, Czech Republic, Italy, Poland, Portugal, France, UK and Romania. Concerning their position, 32% of the participants were University Researchers or Professors (with PhD degree), 16% were Post-doc Researchers, 16% were Researchers (with MSc degree), 21% PhD students and 16% MSc students.

All participants expressed their satisfaction and considered the event useful for their future.

The lectures and hands on presentations were made available for public download on the open project website <https://www.eu-fticr-ms.eu/>.