



**ACTIONr: Research Action Network for Reducing Reactive Nitrogen Losses from Agricultural Ecosystems**

**Grant Agreement No. 101079299**

<b>Document Type:</b>	Training Visit Agenda
<b>Work Package:</b>	WP2: Training and Technology Transfer
<b>Task:</b>	Task 2.2 Staff exchanges and infrastructure sharing
<b>Task ID:</b>	Training Visit no 2: Proteomics, and comparative genomics of AOM
<b>Duration:</b>	15 January 2024 – 26 January 2024
<b>Venue:</b>	Department of Ecogenomics and Systems Biology; Archaea Biology and Ecogenomics Unit; Djerassiplatz 1, 1030 Vienna, Austria
<b>Hosted by:</b>	University of Vienna (UNIVIE)
<b>Training Visit Facilitator:</b>	Prof. Dr Christa Schleper, Dr Melina Kerou, Dr Logan Hodgskiss



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## Agenda

Day	Program
Day 1 - Monday 15 <sup>th</sup> January	<ul style="list-style-type: none"> <li>Theoretical I – Principles of biomolecule extraction and experimental planning: This sets the foundational knowledge necessary for understanding the subsequent practical steps.</li> </ul>
	<ul style="list-style-type: none"> <li>Harvesting of biomass for RNA / protein extraction: This involves the practical aspect of collecting the biological material needed for RNA and protein extraction.</li> </ul>
	<ul style="list-style-type: none"> <li>RNA extraction and quantification (via Nanodrop): This covers the specific procedure for extracting RNA from the harvested biomass and quantifying it using a Nanodrop.</li> </ul>
Day 2 – Tuesday 16 <sup>th</sup> January	<ul style="list-style-type: none"> <li>Theoretical II – Protein quantification and preparation for Mass Spectrometry: This expands on the theoretical knowledge, focusing on protein quantification and preparation for further analysis via Mass Spectrometry.</li> </ul>
	<ul style="list-style-type: none"> <li>RNA samples pre-treatment (phenol cleanup): This step involves pre-treating RNA samples to remove contaminants such as phenol, ensuring the purity of the RNA samples for downstream applications.</li> </ul>
	<ul style="list-style-type: none"> <li>Protein extraction: This covers the practical procedure for extracting proteins from the harvested biomass, which is an essential step for further protein analysis.</li> </ul>
Day 3 – Wednesday 17 <sup>th</sup> January	<ul style="list-style-type: none"> <li>Protein quantification and digestion: This involves measuring protein amounts and breaking them down into smaller peptides.</li> </ul>

Day 4 – Thursday 18 <sup>th</sup> January	<ul style="list-style-type: none"> <li>Theoretical III – Principles of Mass Spectrometry (LC-MS/MS): This ensures understanding of the basics of LC-MS/MS.</li> </ul>
	<ul style="list-style-type: none"> <li>Peptide desalting: This hands-on activity involves the removal of residual salts from peptide samples.</li> </ul>
Day 5 – Friday 19 <sup>th</sup> January	<ul style="list-style-type: none"> <li>First week summary – Catch-up: This session serves as a review and summary of the concepts covered in the first week of training.</li> </ul>
Day 6 – Monday 22 <sup>nd</sup> January	<ul style="list-style-type: none"> <li>Theoretical IV – Pipeline of MS data analysis: This includes data preprocessing, peak detection, identification of peptides and reconstruction of the peptide sequences.</li> </ul>
	<ul style="list-style-type: none"> <li>Hands-on MS data analysis: This practical session involves applying the concepts learned in the theoretical session to analyze real mass spectrometry data.</li> </ul>
Day 7 – Tuesday 23 <sup>rd</sup> January	<ul style="list-style-type: none"> <li>Protein Quantification and Digestion: This session involves techniques for measuring the concentration of proteins in a sample and breaking them down into smaller peptide fragments.</li> </ul>
Day 8 – Wednesday 24 <sup>th</sup> January	<ul style="list-style-type: none"> <li>Unit Seminar (Dr. L. Hodgskiss – Ammonia Oxidising Archaea Bioenergetics): Lecture on the bioenergetics of Ammonia Oxidising Archaea by Dr. L. Hodgskiss.</li> </ul>
	<ul style="list-style-type: none"> <li>Ammonia Oxidising Archaea BNI fast – track bioassay setup: This involves the setting up of a rapid bioassay for assessing the potency of Ammonia Oxidising Archaea BNI.</li> </ul>
Day 9 – Thursday 25 <sup>th</sup> January	<ul style="list-style-type: none"> <li>Theoretical V – Ammonia Oxidising Archaea Genomics and Comparative Genomics</li> </ul>

	<p>(Workshop by Dr M. Kerou): This workshop session focuses on the genomics of Ammonia Oxidising Archaea and comparative genomics techniques (i.e. genome sequencing, annotation, and comparative analysis among different strains).</p>
	<ul style="list-style-type: none"> <li>• Hands-on protein annotation: This hands-on activity involves practical in annotating proteins, which involves identifying their putative functions based on domains and structural features, relying on available databases and bioinformatics tools.</li> </ul>
	<ul style="list-style-type: none"> <li>• RNA DNase digest: This practical session involves the digestion of RNA samples with DNase enzyme to remove any contaminating DNA.</li> </ul>
<p>Day 10 – Friday 26<sup>th</sup> January</p>	<ul style="list-style-type: none"> <li>• Diagnostic PCR for DNA check in DNase treated RNA samples: This involves the performance of polymerase chain reaction (PCR) to check for the presence of DNA in RNA samples even after DNase treatment.</li> </ul>
	<ul style="list-style-type: none"> <li>• Training closure: This session marks the conclusion of the training program.</li> </ul>