



**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 4: Transcriptomics
<b>Duration:</b>	10 March 2025 - 21 March 2025
<b>Venue:</b>	Archaea Ecology and Evolution Group, Unit of Archaea Biology and Ecogenomics, University of Vienna, Djerassiplatz 1 1030, Vienna
<b>Hosted by:</b>	University of Vienna
<b>UTH participants</b>	Dimitrios Dalkidis; Paraskevi Amanatidou
<b>Training Visit Facilitator:</b>	Prof. Dr. Christa Schleper, Dr. Logan Hodgskiss



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## Agenda

<b>Day 1 -Date: Monday 10/03/2025</b>
<ul style="list-style-type: none"> <li>• Guided tour at the laboratory of Archaea Biology and Ecogenomics Unit, University of Vienna</li> <li>• Laboratory Safety Training and Guidelines by Logan Hodgskiss</li> </ul>
<b>Day 2 – Date: Tuesday 11/03/2025</b>
<ul style="list-style-type: none"> <li>• <b>Introductory Workshop on Basic Statistics</b> <ul style="list-style-type: none"> <li>➤ Overview of key statistical concepts, including distributions and descriptive statistics</li> <li>➤ Introduction to z-scores</li> <li>➤ Practical examples to illustrate key principles</li> </ul> </li> </ul>
<b>Day 3 - Date: Wednesday 12/03/2025</b>
<ul style="list-style-type: none"> <li>• <b>Lab Meeting Presentation</b> <ul style="list-style-type: none"> <li>➤ Participants present their work or relevant topics.</li> <li>➤ Feedback and discussion with peers and supervisors</li> </ul> </li> </ul>
<b>Day 4 – Date: Thursday 13/03/2025</b>
<ul style="list-style-type: none"> <li>• <b>T-test application for Two-Group Comparisons</b> <ul style="list-style-type: none"> <li>➤ Introduction to the independent and paired t-tests, their assumptions and use</li> <li>➤ Step-by-step calculation and interpretation of p-values</li> <li>➤ Hands-on examples using real datasets for practical understanding</li> </ul> </li> </ul>
<b>Day 5 – Date: Friday 14/03/2025</b>
<ul style="list-style-type: none"> <li>• <b>ANOVA for Multiple Group Comparisons</b> <ul style="list-style-type: none"> <li>➤ Explanation of one-way and two-way ANOVA, assumptions, and interpreting F-statistics</li> <li>➤ Post-hoc tests (Tukey's, Bonferroni) for multiple comparisons</li> </ul> </li> </ul>
<b>Day 6 – Date: Monday 17/03/2025</b>
<ul style="list-style-type: none"> <li>• <b>Parametric vs. Non-Parametric Tests</b> <ul style="list-style-type: none"> <li>➤ Key differences between parametric and non-parametric methods</li> <li>➤ Introduction to non-parametric alternatives; Mann-Whitney U test and Kruskal-Wallis test</li> <li>➤ Practical comparison of both approaches on transcriptomic data</li> </ul> </li> </ul>
<b>Day 7 – Date: Tuesday 18/03/2025</b>
<ul style="list-style-type: none"> <li>• <b>Practical Analysis of Transcriptomic Data - Statistical Method</b> <ul style="list-style-type: none"> <li>➤ Introduction to microbial ecology transcriptomic data along with pre-processing steps</li> <li>➤ Application of statistical tests to identify differentially expressed genes</li> <li>➤ Hands-on session for participants to perform the analysis and interpret initial results</li> </ul> </li> </ul>

### Day 8 – Date: Wednesday 19/03/2025

- **Practical Analysis of Transcriptomic Data - Biological Interpretation**
  - Review and discussion of statistical results, focusing on gene expression changes
  - Exploration of the biological relevance of findings, linking differentially expressed genes to metabolic pathways and microbial ecological functions
  - Visualization techniques (heatmaps, volcano plots) to further interpret the data and generate insights into microbial responses

### Day 9 – Date: Thursday 20/03/2025

- **Hands-On Analysis of Transcriptomic Data- PCA plots**
  - Visualization of transcriptomic data using Principal Component Analysis (PCA)
  - Interpretation of PCA plots to identify patterns, clustering, and variance in the data
  - Understanding how PCA helps in exploring relationships between samples

### Day 10 – Date: Friday 21/03/2025

- **Training wrap-up and Future Directions**
  - Recap of key concepts, methods, and biological interpretation covered throughout the training
  - Open forum for questions, clarifications, and feedback from participants
  - Discussion of potential next steps in transcriptomic data analysis and future learning opportunities