

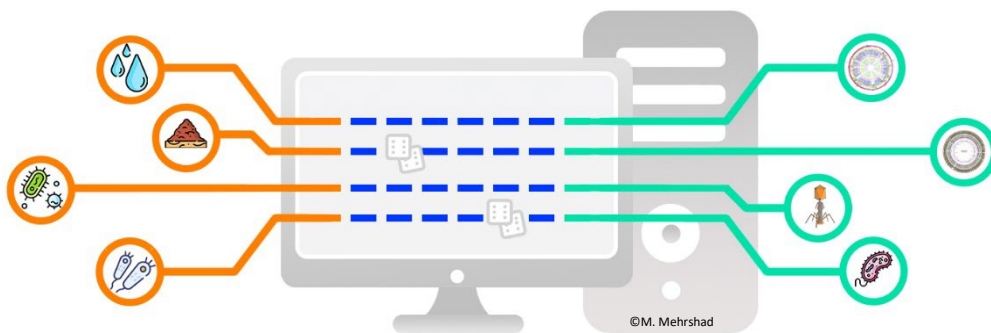
Multi-omics analyses of the microbial community, 3.0 Credits

March 3rd to March 14th 2025

Location: Campus Ultuna, Uppsala

In the last couple of decades, metagenomics approaches have completely updated our view on microbial diversity and have become an exciting approach to push the frontiers of microbiome research. As we are moving forward, we have questions about activity and interaction of microbes, which cannot be answered by relying only on metagenomics. In addition to understanding the diversity of microbes in each environment, we want to know what they are doing and how their metabolites are contributing to ecosystem functioning and elemental cycling. So it is inevitable that we need to combine methods to not only look into microbial genomes but also explore the genes they transcribe, proteins they synthesis and metabolites they generate.

Now is the prime time for multi-omics analyses, meaning using a combination of different high throughput omics approaches, to get a more comprehensive understanding of the ecosystem and its microbiome. **The main challenge in the way for these analyses is the effective combination of these omics methods in a multi-omics perspective that will enable us to answer a specific question.**



This course will start by providing a basic understanding of potential and limitations of different high throughput omics methods and then enable students to use this knowledge for building a proper multi-omics perspective fitting their biological question. We will also have a specific focus on gene annotation since genes are the key for allowing us to integrate and connect different omics approaches. This course will familiarize students with different analyses approaches and proper gene annotation methods. Students will learn to design multi-omics studies and identify the appropriate analyses method for different multi-omics datasets and questions.

If you have more questions about course content and pre-requirements please reach out to course leader Maliheh Mehrshad (Maliheh.mehrshad@slu.se).