Workshops on biomarker discovery in metagenomics

Day 1 – March 26, 2026
Venue: Library, 1st floor, IBISS, Belgrade

Time	Title	Speaker/Participants
09:30 – 10:00	Registration of participants	
10:00 – 10:45	**General introduction** Microbiome research at Amsterdam UMC Typical study designs Diagnostic, prognostic, predictive biomarkers Common pitfalls in microbiome studies	Mark Davids, AmsterdamUMC
10:45 – 11:00	Coffee break	
11:00– 11:45	**Data Characteristics & Statistical Challenges** How to deal with compositional data and sparsity Simplex and Euclidean space data Normalization and transformation concepts Why naïve statistical approaches often fail? Confounders and drawing directed acyclic graphs	Dr. Amir Alizadeh, AmsterdamUMC
11:45 – 12:00	Coffee break	
12:00 – 12:45	**Differential Abundance Analysis** Univariate approaches Overview of commonly used methods (LEFSe, ANCOMBC2, ALDEX2, MaAsLin3) Pros and cons Analysis pitfalls	Dr. Amir Alizadeh, AmsterdamUMC
12:45 – 14:00	Lunch	
14:00 – 15:30	**Hands on session on real data**	Mark Davids, AmsterdamUMC

Day 2 – March 27, 2026
Venue: Library, 1st floor, IBISS, Belgrade

10:00 – 10:45	**Biomarker Selection and Model Building** Multivariate approaches: Logistic regression (backward/forward selecting approaches) LASSO Random Forest Gradient Boosting ROC and AUROC curves	Mark Davids/Dr. Amir Alizadeh, AmsterdamUMC
10:45 – 11:00	Coffee break	
11:00 – 11:45	**Visualization and Interpretation** Effective visualization strategies: Volcano and forest, Heatmaps Constrained and unconstrained ordination plots (PCA, PCoA, RDA, dbRDA)	Mark Davids/Dr. Amir Alizadeh, AmsterdamUMC
11:45 – 12:00	Coffee break	
12:00 – 13:00	**A biomarker is found! What comes next?** Closing remarks and take-home messages	Mark Davids/Dr. Amir Alizadeh, AmsterdamUMC