iSEEtree: an R package for the interactive visualisation of microbiome data

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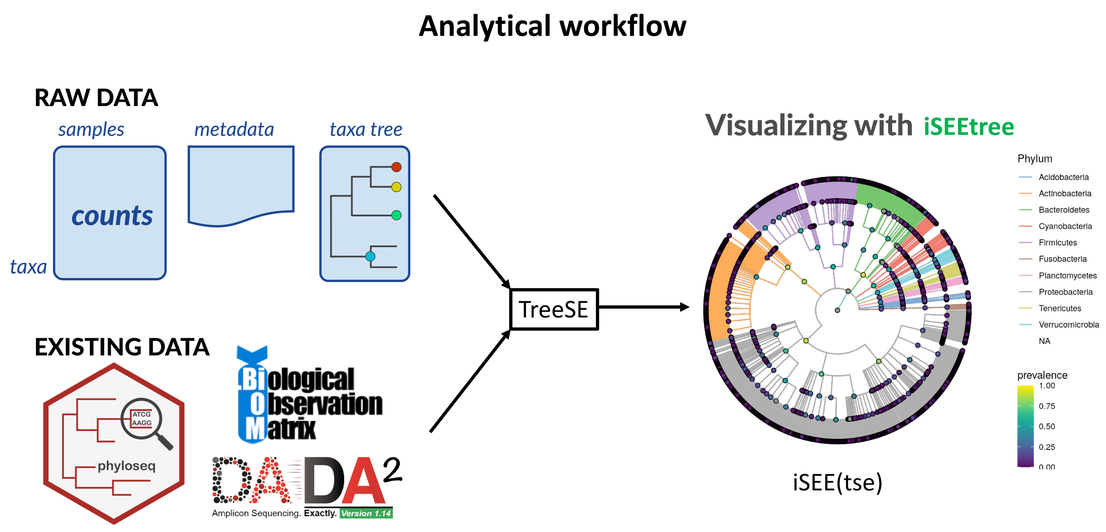
The Problem

Visual exploration is a key step of microbiome data analysis, as it reveals the nature of the data and helps draw informed conclusions from it. However, currently available methods require basic knowledge of R programming and microbiome data structures. Here, we present iSEEtree, an R/Bioconductor shiny app for the **visualisation and interactive exploration of microbiome data** in the form of TreeSummarizedExperiment (TreeSE).

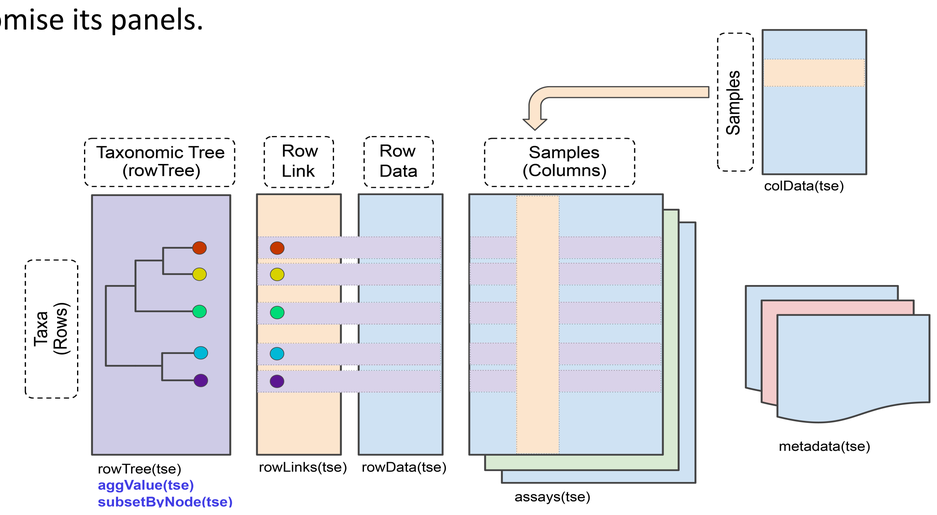


The App

The iSEEtree app provides a **customisable set of panels** describing different aspects of the microbiome community under investigation. For each panel, several parameters are available to transform data (*Data parameters*), control aesthetics (*Visual parameters*) and select a subset of the data (*Selection parameters*). Users can also view and modify the underlying R scripts and ultimately download plots as images for publishing and reporting purposes.

The `TreeSE` container

TreeSE is a **data structure designed for hierarchical data** such as the microbiome [1]. Its key components include one or more abundance tables (`assays`), sample metadata (`colData`), feature metadata (`rowData`) and a phylogenetic tree (`rowTree`). iSEEtree uses information from any of those items to generate and customise its panels.



The Future

We aim to expand the catalogue of iSEEtree graphics and add more interactive features to the existing panels. Also, a **completely web-based app** (iSEEbug) is under development. Feedback and contributions are welcome!

Acknowledgements

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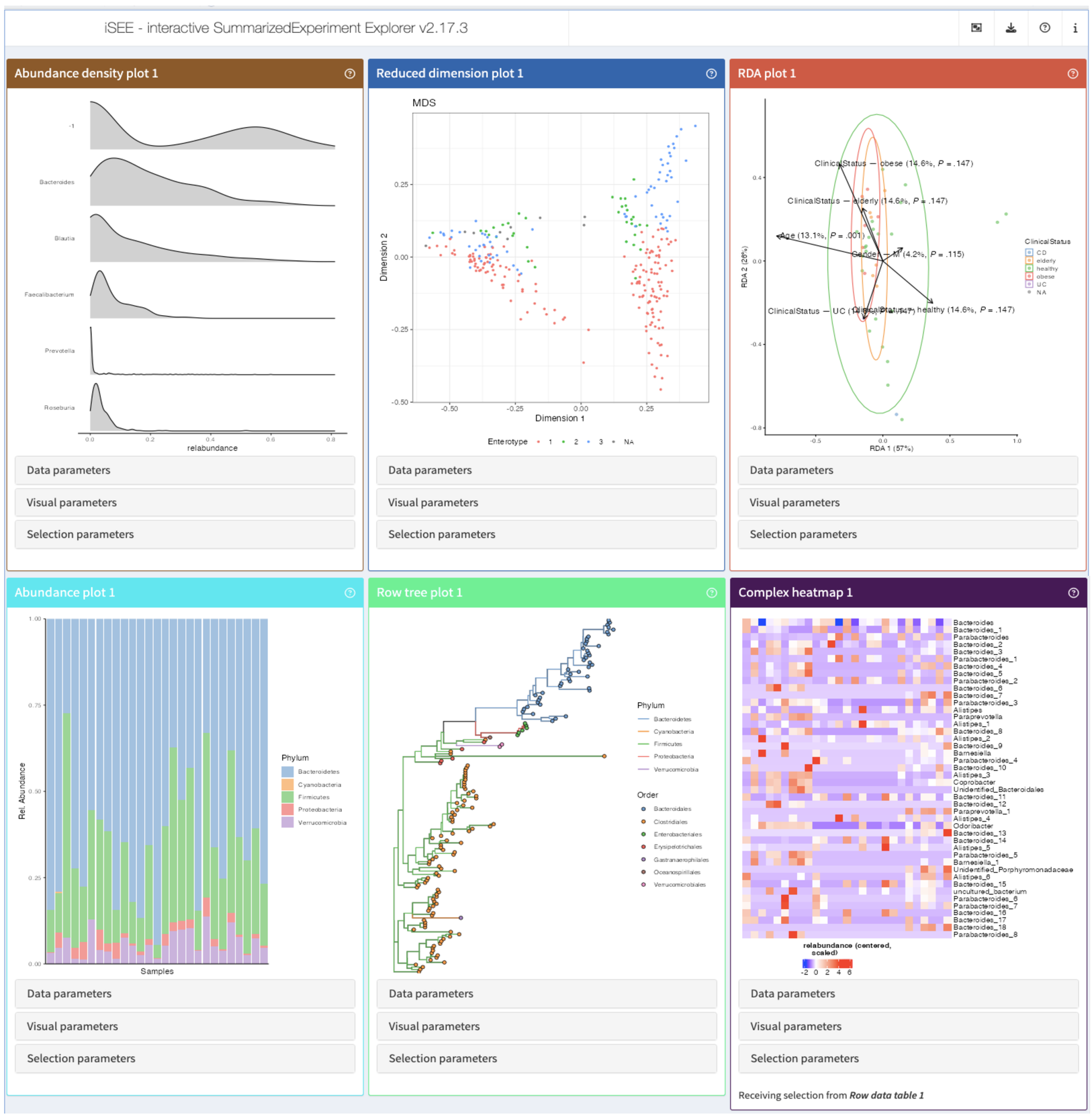

References:
1. Huang R, Soneson C, Ernst FG, Rue-Albrecht KC, Yu G, Hicks SC, Robinson MD (2021). "TreeSummarizedExperiment: a S4 class for data with hierarchical structure." *F1000Research*, **9**, 1246. https://f1000research.com/articles/9-1246.
2. Rue-Albrecht K, Marini F, Soneson C, Lun ATL (2018). "iSEE: Interactive SummarizedExperiment Explorer." *F1000Research*, **7**, 741. doi:10.12688/f1000research.14966.1.