

miaverse

Microbiome analysis framework in SummarizedExperiment family

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CONTRIBUTORS:

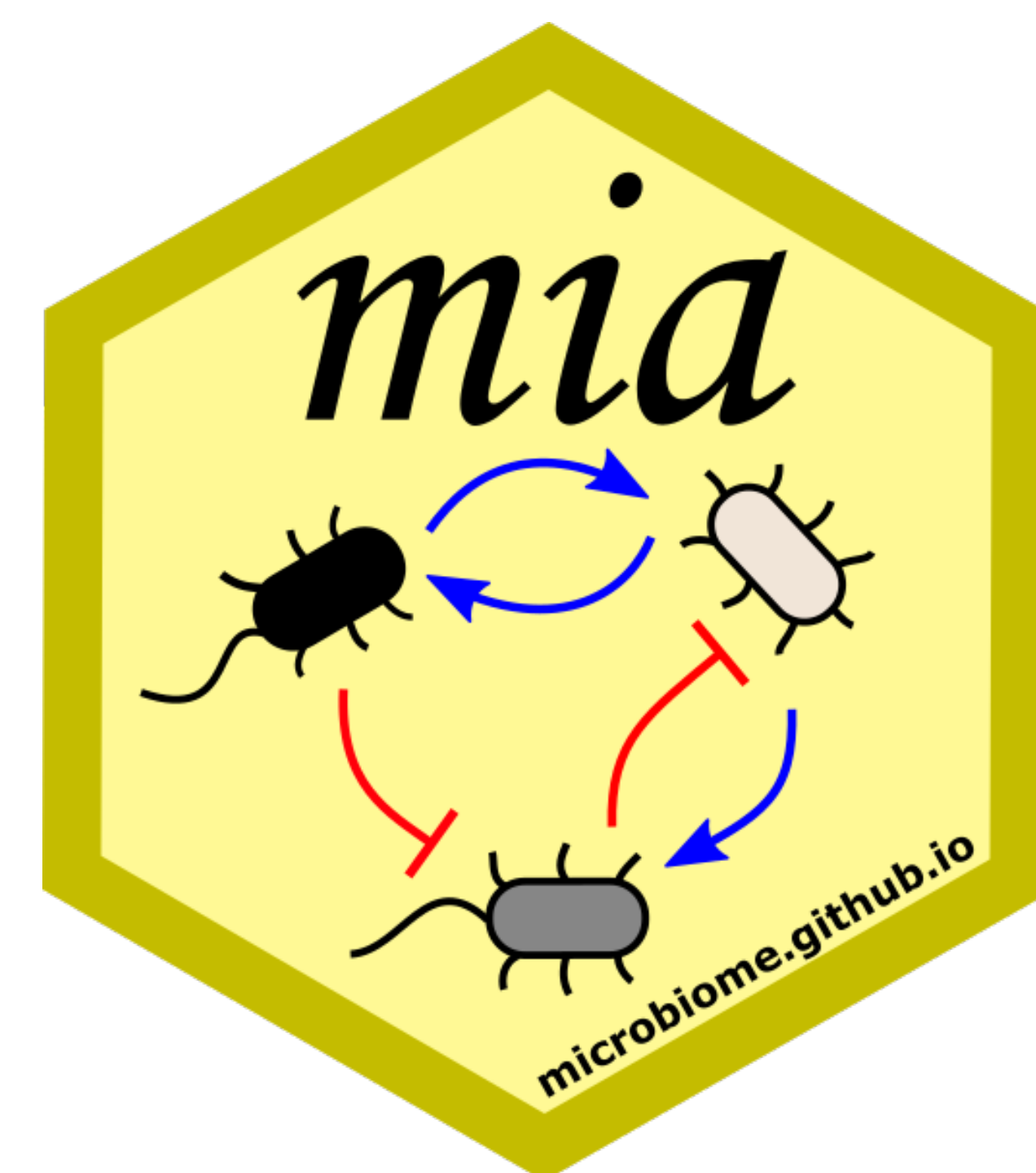
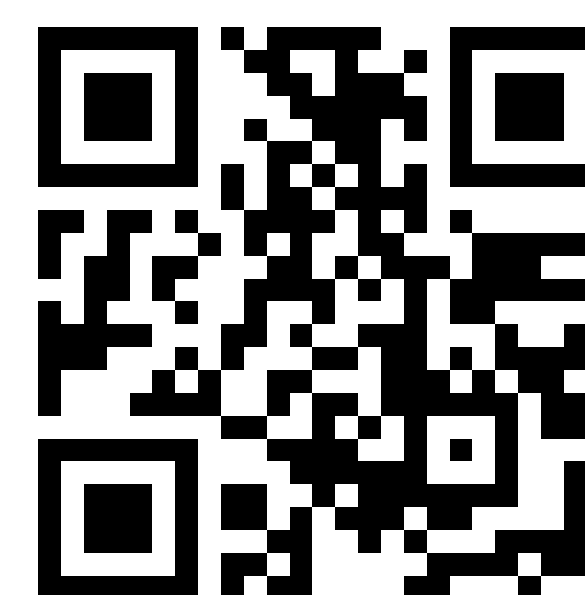
The miaverse collective. For the full list of contributors, see the project website.

MORE INFORMATION:

Go to project website.

Join **#miaverse** BioC Slack channel.

Project website
microbiome.github.io



Remember: Package demo @EuroBioC2023 Thursday 13:30 CEST

MOTIVATION

- Existing microbiome workflows in Bioconductor has been largely unsupported by the **rich and versatile SummarizedExperiment (SE) family** of classes.

- Shared data container** can reduce overlapping efforts, improve interoperability and ensure longterm sustainability.

- As sample size get bigger and multiomics approach is applied, more efficient **data management, handling and wrangling** methods are required.

METHODS

- Emerging analysis framework called **miaverse** (MIcrobiome Analysis uniVERSE) utilizes a common, standardized data container, **TreeSummarizedExperiment**.

- miaverse contains **methods for data analysis and visualization** together with the comprehensive **online tutorial book**.

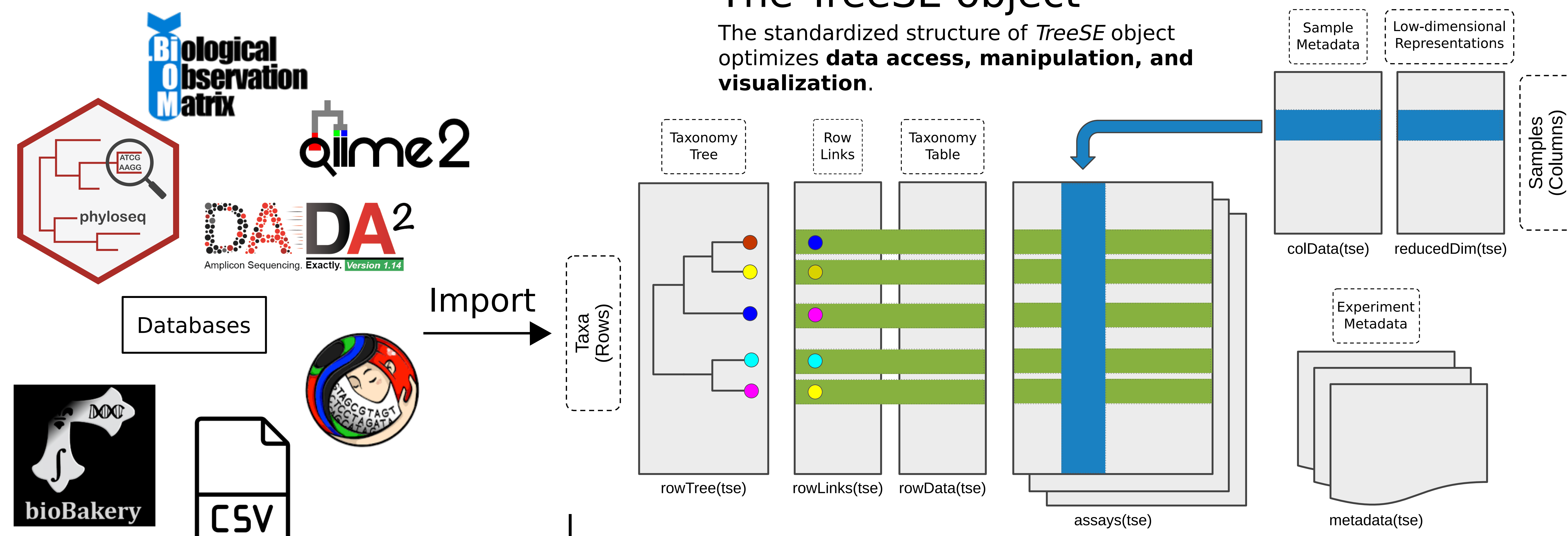
- The miaverse is a **collaborative open-source project**, and stable version is available via R/Bioconductor.

* Huang R, Soneson C, Ernst FGM et al.
TreeSummarizedExperiment: a S4 class for data with hierarchical structure
[version 2; peer review: 3 approved].
F1000Research 2021, 9:1246

WORKFLOW: TreeSummarizedExperiment (TreeSE) & miaverse

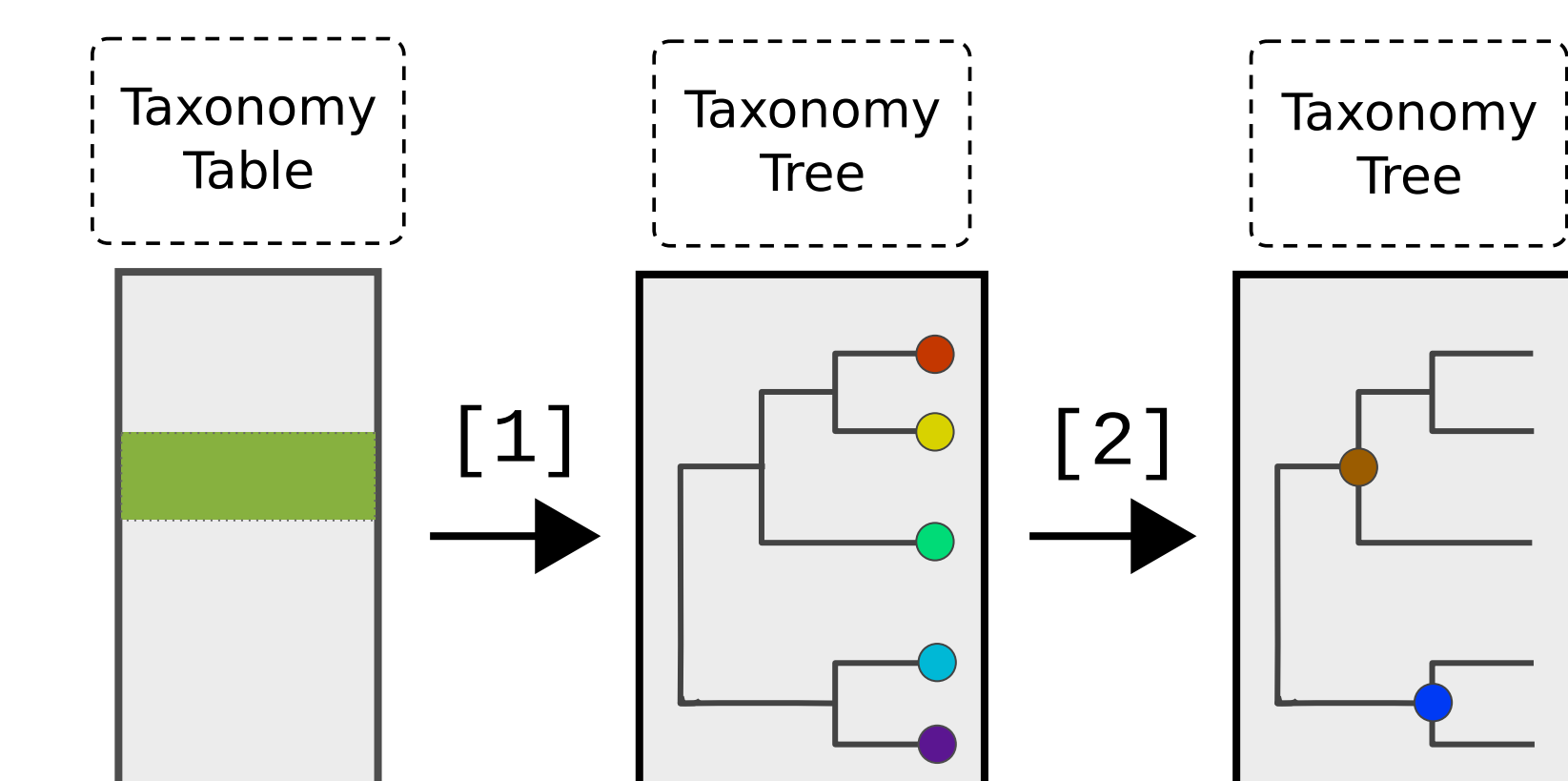
The TreeSE object*

The standardized structure of *TreeSE* object optimizes **data access, manipulation, and visualization**.



The miaverse pipeline

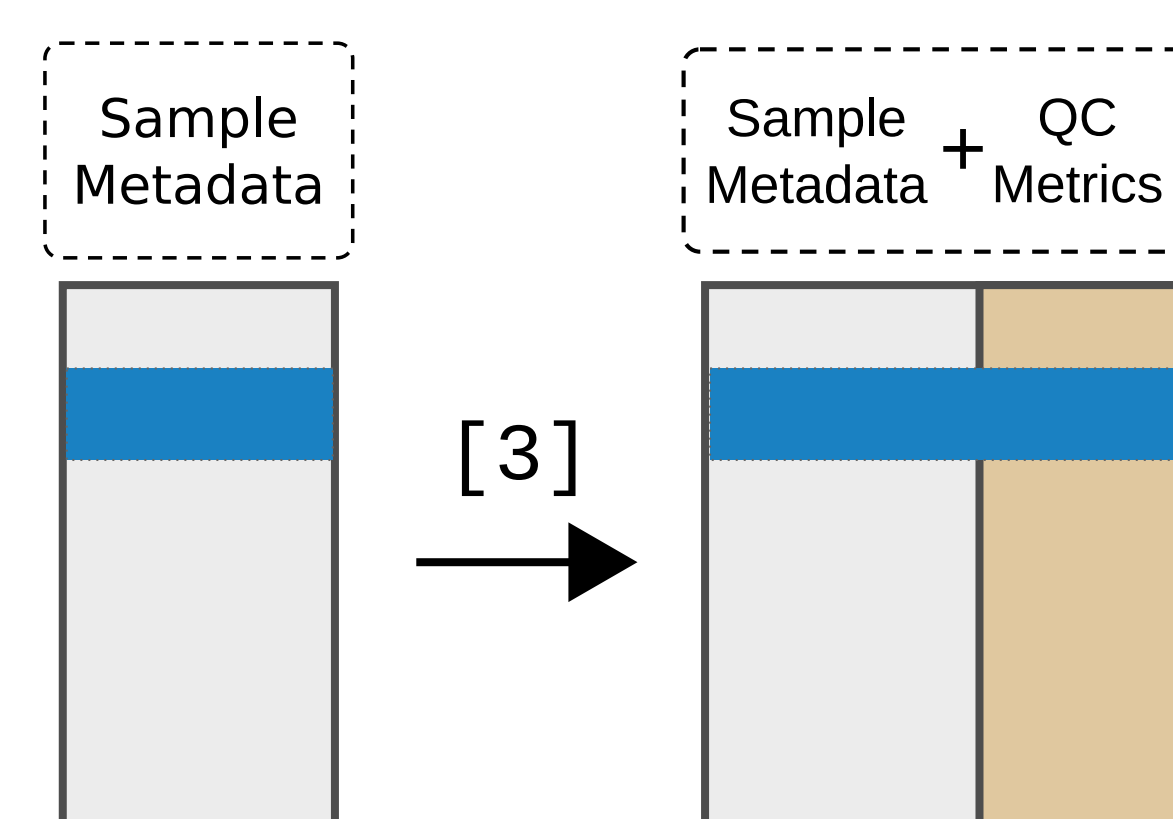
Data Wrangling



[1] `mia::addTaxonomyTree(tse)`

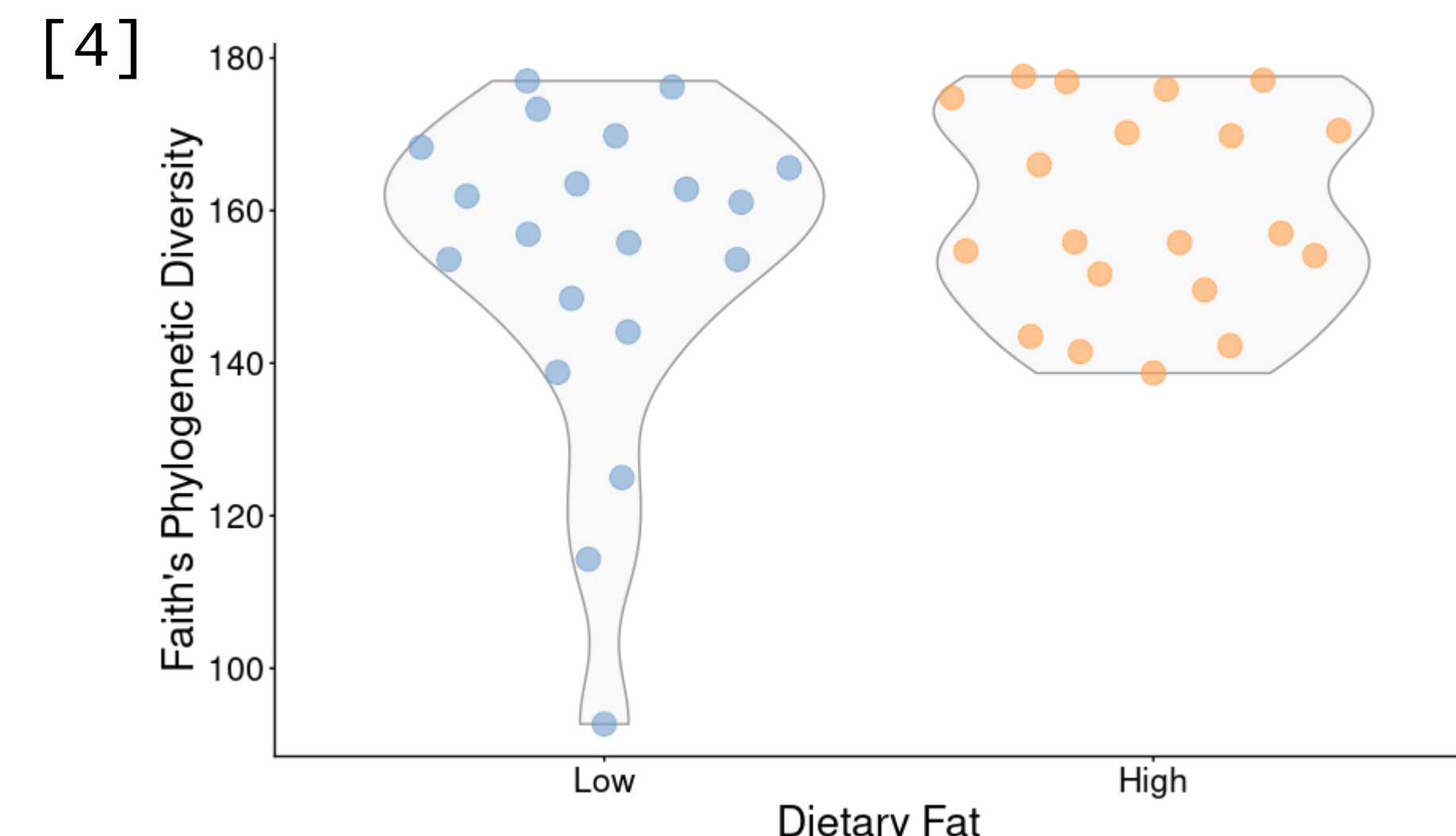
[2] `TreeSE::aggValue(tse)`

Quality Control



[3] `scater::addPerCellQC(tse)`

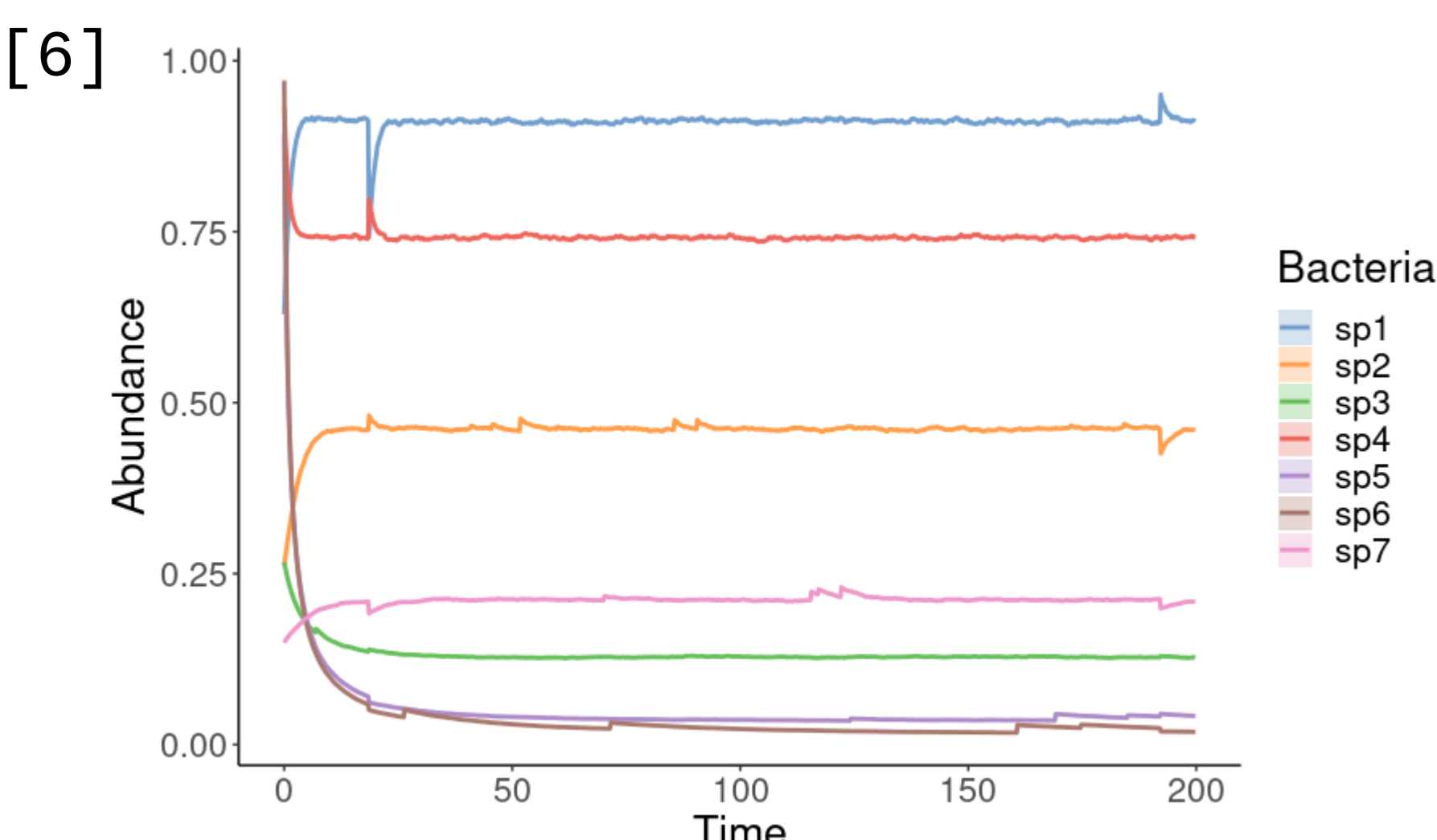
Analysis



[4] `mia::estimateDiversity(tse)`

[4] `scater::plotColData(tse)`

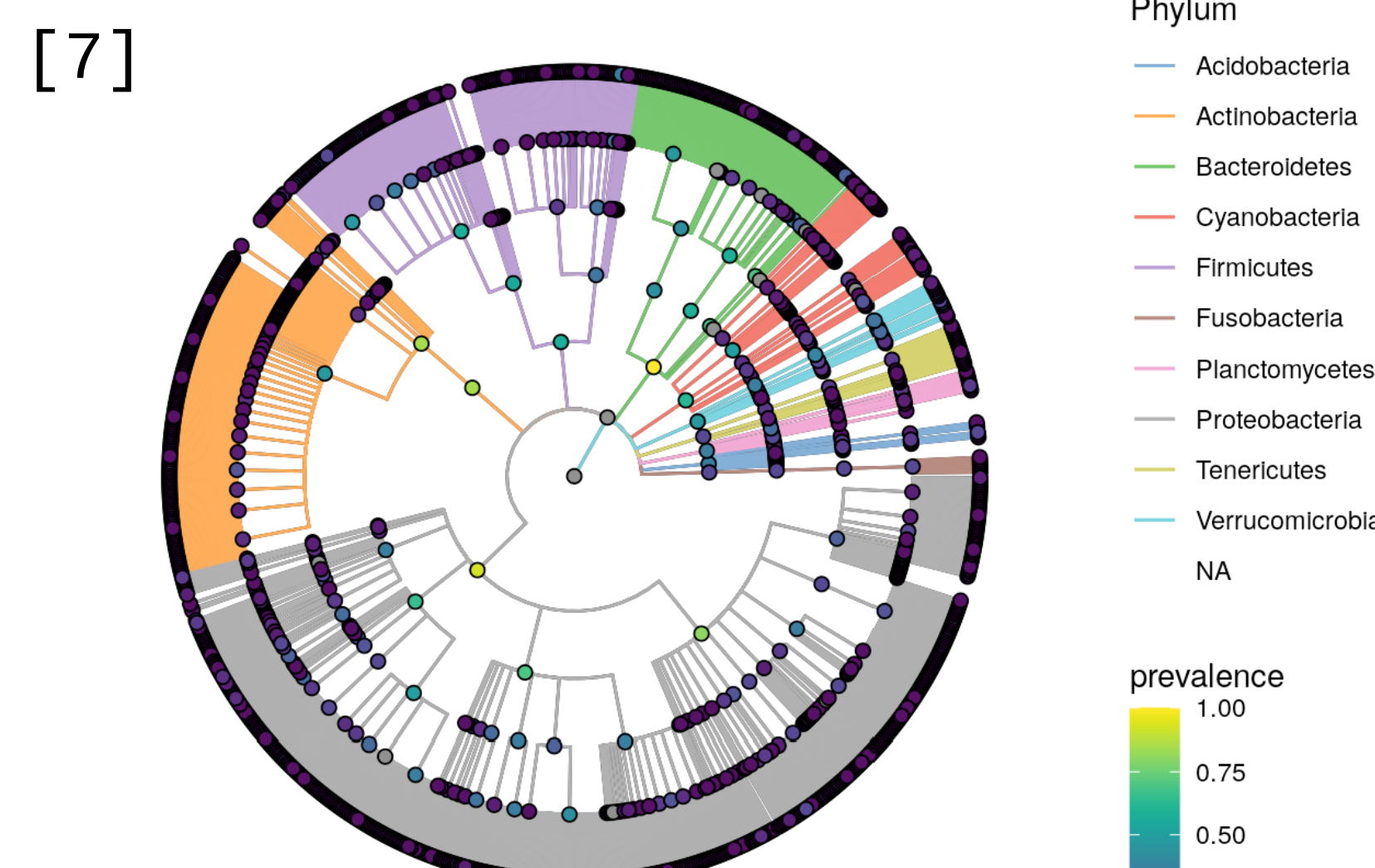
Simulation



[6] `miaSim::simulateGLV(x)`

[6] `miaViz::plotSeries(tse)`

Visualization



[7] `miaViz::plotRowTree(tse)`

Check **Orchestrating Microbiome Analysis (OMA) tutorial book** for more examples and information.

