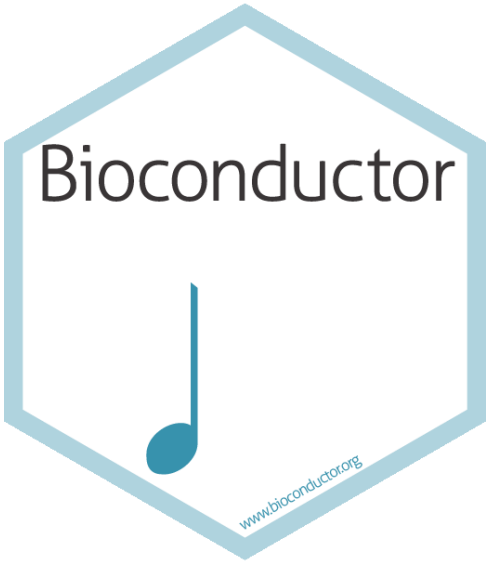
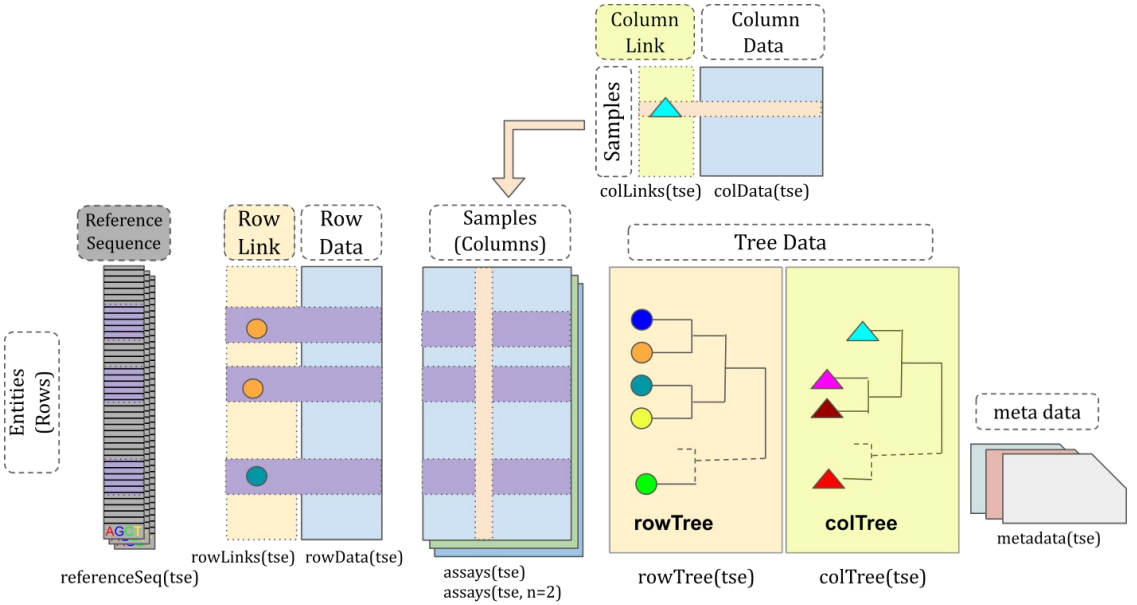
Multi-omic data science with R/Bioconductor

Oulu summer school, June 20-23, 2022

Welcome!





Acknowledgments

The course is jointly organized by

- Health and Biosciences Doctoral Programme University of Oulu Graduate School
- Cancer & Translational Medicine Research Unit, University of Oulu
- Department of Computing, University of Turku, Finland

Finnish IT Center for Science (CSC) provides cloud computing services

Facilitators

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You

Participants & Wishlists

https://tinyurl.com/2vma9uvd

Code of Conduct

The Bioconductor community values an open approach to science that promotes the

- sharing of ideas, code, software and expertise
- collaboration
- diversity and inclusivity
- a kind and welcoming environment
- community contributions

By participating in this community, you agree not to engage in behavior contrary to these values at any Bioconductor-sponsored event or electronic communication channel.

For the full CoC, see:
https://bioconductor.github.io/bioc_coc_multilingual/

Learning goals

open & reproducible data science workflows

advanced R/Bioconductor tools

motivation & challenges in multi-omics

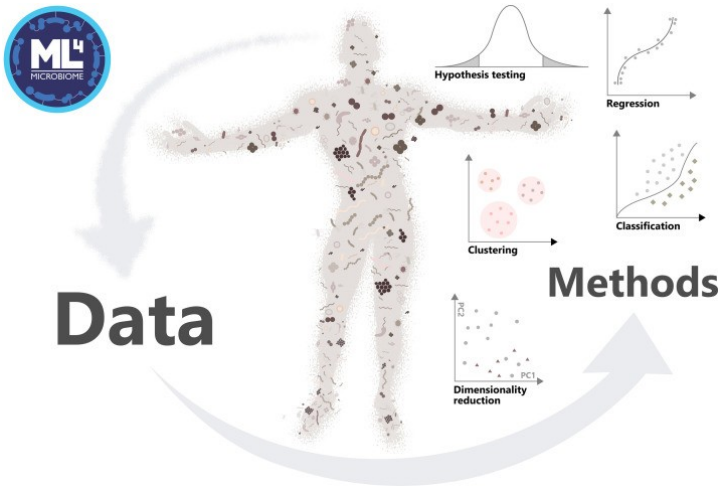

Figure source: Moreno-Indias et al. (2021) Statistical and Machine Learning Techniques in Human Microbiome Studies: Contemporary Challenges and Solutions. URL: https://doi.org/10.3389/fmicb.2021.635781. Frontiers in Microbiology 12:11.

Overview of the week

- Day 1: data science framework *(data containers)*
- Day 2: single-assay data analysis (*tabular data*)
- Day 3: multi-assay data analysis (*multi-table data*)
- Day 4: summary & conclusion

Schedule

	Mon (framework)	**Tue** (tabular data)	**Wed** (multi-omic)	**Thu** (extensions)
9	Welcome!	Lecture	Lecture	Summary
10	Lecture	Demo	Demo	Demo
11	Demo	Hands-on	Hands-on	Hands-on
12	Lunch	Lunch	Lunch	Wrap-up
13	Demo	Demo	Demo	Lunch
14	Coffee	Coffee	Coffee	
15	Hands-on	Hands-on	Hands-on	
16	Presentations	Presentations	Presentations	
17	Q&A	Q&A	Q&A	
18				
19	Dinner		Dinner	

Team or individual presentations?

Coffee times & optional (evening) program

Lectures & Demonstrations:

- Don’t hesitate to ask questions!

Hands-on sessions:

- Tasks & example data sets
- Supporting online material
- Many ways to solve a given task

Presentations:

- Present your solution to the task
- Highlight open questions and challenges
- Engage the audience

CSC notebook

- Login with CSC/Haka or Guest account
- Preinstalled R packages
- 16 Gb memory
- 10 hour uptime at one go
- Shared data workspace

Personal laptop

- Good for later use
- Installation issues depend on the system
- Some support provided

Getting started

Checklist

- CSC notebook, R/Rstudio/packages ok..?
- Using your own data?

Support

- Online chat (Gitter)

Questions?

https://microbiome.github.io/course_2022_oulu

NATURE | TOOLBOX

How scientists use Slack

Eight ways labs benefit from the popular workplace messaging tool.

Jeffrey M. Perkel

29 December 2016

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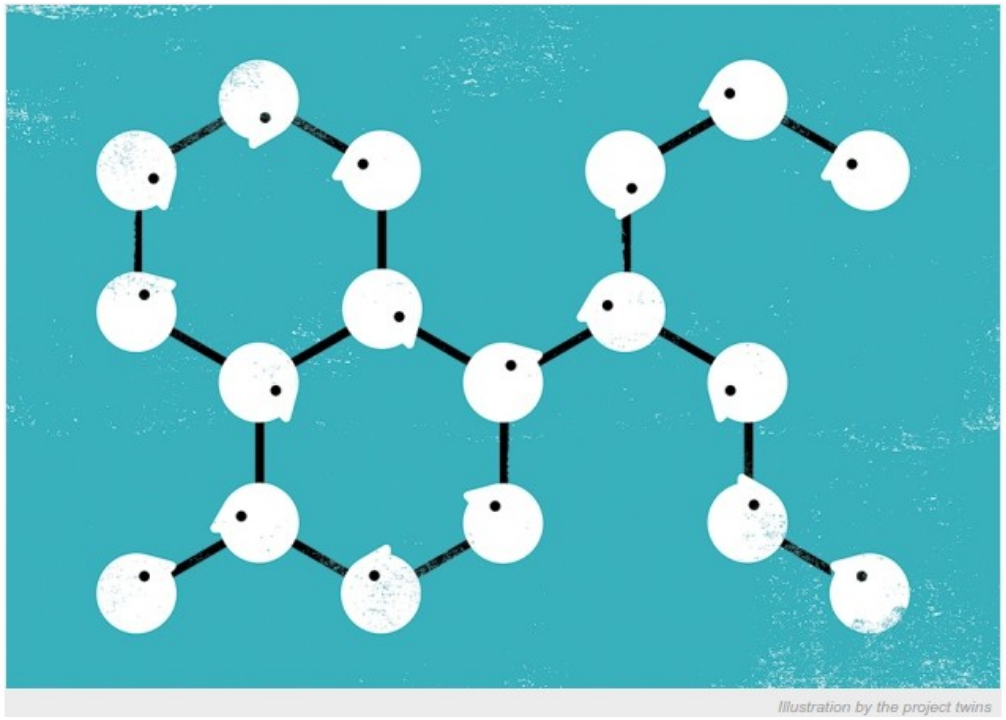
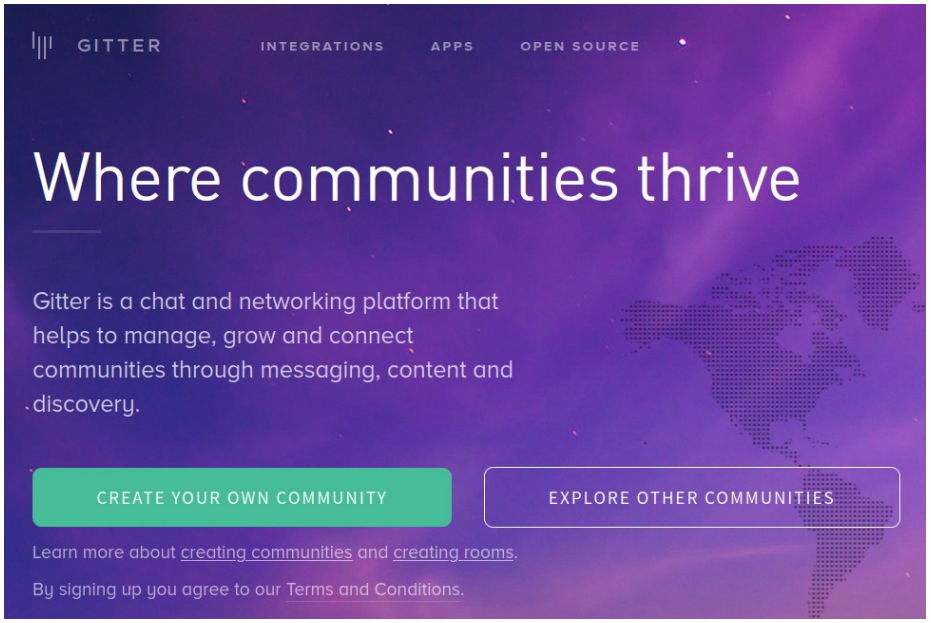


Illustration by the project twins



https://gitter.im/microbiome/miaverse

Program - Day 1

Morning session

- 9-10 Coffee, Welcome & Practicalities
- 10-11 Lecture: Open & reproducible workflows
- 11-12 Demo & hands-on: Introduction to CSC RStudio notebook
- 12-13 Lunch break

Afternoon hands-on session

- 13-15 Demo: Data science framework
- 15-17 Hands-on: microbiome data summaries & exploration
- 17-18 Presentations & Discussion

Today's learning goal:
data containers & data science framework