

Introduction to R Markdown

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What is Markdown?

- Lightweight markup language
- Write text and 'tag' elements for formatting later
 - Similar to LaTeX or HTML, but much simpler
- Can be used to create many types of output

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- Time for a live demo
 - `example_1-layout.md`

What is R Markdown?

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- Basically **R** + Markdown
- You can include blocks of code
- Allows you to keep in a single document:
 - Code
 - Explanatory text
 - Output e.g. tables, figures

A few examples

- <https://mfr.osf.io/render?url=https://osf.io/v6njb/?action=download%26mode=render>
- <https://bioconductor.org/packages/release/bioc/vignettes/BiocStyle/inst/doc/AuthoringRmdVignettes.html>
- <https://www.huber.embl.de/msmb/>

Literate Programming & Live Documents

“The main idea is to regard a program as a communication to human beings rather than as a set of instructions to a computer.” - Donald Knuth

- Combines ‘human readable’ prose with source code in a single document
- Analyses can be easily understood and repeated

Repeatability vs Reproducibility

- Can you get my results from my data?

How can R Markdown help?

- How often do you have code/ideas/figures spread across multiple files?
- An example
 - <https://doi.org/10.1186/1471-2105-11-208>
- Look at Supplementary File 2

R Code Chunks

- `example_2-codechunks.Rmd`
- `example_3-chunkOptions.Rmd`
- `example_4-simplePipeline.Rmd`

sessionInfo()

- Just because you can run a script later, doesn't mean it gives the same answers!
 - R changes
 - Packages change
 - Locale settings etc

How to use R Markdown?

- Consider always using it!
 - If you're going to write a script, make it Rmd
- Treat writing code like a lab book

Publishing with R Markdown

Bioconductor Workflows

- Educational documents detailing how to use multiple packages
- Regularly checked on Bioconductor servers
 - Ensures changes in component tools are identified quickly
 - Allows rapid updates by author
 - Provides users a platform to easily access the complete suite of tools
- Difficult to get credit

BiocWorkflowTools

```
source("https://bioconductor.org/biocLite.R")  
biocLite("BiocWorkflowTools")
```

Conclusions

- R Markdown is great for:
 - Lab book / journal recording
 - Reports
 - Supplementary materials
- As a principle document for journal articles - we're not there yet!

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