## Introduction to R Markdown

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April 6, 2018

#### 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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#### What is R Markdown?

- Basically R + Markdown
- You can include blocks of code
- Allows you to keep in a single document:
  - Code
  - Explainatory 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

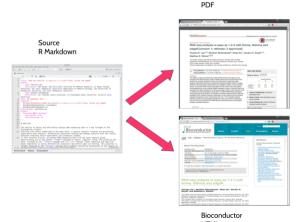
# Publishing with R Markdown

#### **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

#### F1000Research

- F1000Research provides a citable, peer-reviewed publication platform
- Intention is for the same document to be submitted to both platforms updates are



•

HTML

## **BiocWorkflowTools**

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

#### **Conclusions**

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

# Acknowledgements

Andrzej Oles Bernd Klaus Wolfgang Huber



