# Welcome to the June 2022 Reproducible Research Practices Workshop!

10 June 2022
Childhood Cancer Data Lab
https://alexslemonade.github.io/reproducible-research/

# Tell us about you!

- What's your name?

- What are you studying?

- What summer activity are you looking forward to most?

# Meet your instructors

**Data Scientist @ the Data Lab**

PhD Ecology & Evolution, *UChicago*
Postdoc Integrative Genomics, *Princeton*

Research interests:
- **Evolutionary genomics**
- **Single cell workflows**

jashapiro

JOSH

Joshua Shapiro

# Meet your instructors

**STEPHANIE**

Stephanie Spielman

**Data Scientist @ the Data Lab**

PhD Integrative Biology *UT Austin*
Postdoc Computational Molecular Evolution *Temple*

Research interests:
- **Protein evolution and phylogenetic modeling**
- **Data science and bioinformatics education**

sjspielman

# Meet your instructors

**Biological Data Analyst @ the Data Lab**

Bachelor's in Bioinformatics from *Rowan University*

Research interests:
- **Functional motifs in the proteome**

CHANTE

Chante Bethell

cbethell

# Meet your instructors



Ally
Ally Hawkins

**Data Scientist @ the Data Lab**

PhD Cancer Biology *University of Michigan*
Postdoc Computational Biology *Cornell*

Research interests:
- **Single cell data analysis**
- **Origins of pediatric solid tumors**

allyhawkins

# Meet your instructors

**Director @ the Data Lab**

PhD Genetics *Dartmouth*
Postdoc Computational Biology *UPenn*

Research interests:
- **Transcriptomics in rare, complex diseases**
- **Unsupervised pattern extraction**

 jaclyn-taroni

JACLYN
Jaclyn Taroni

# Other staff you will see (or have seen already!)



JEN
Jen O'Malley

**Scientific Community Manager** @ the Data Lab

- Promotes our resources to the community and helps administer offerings, like this workshop!
- Manages Data Lab communications

Jen-OMalley

# Tell us about you!

- What's your name?

- What are you studying?

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# Code of Conduct

# Be kind, have fun

We value the involvement of everyone in the community. We are committed to creating a friendly and respectful place for learning, teaching, and contributing.

- Use welcoming and inclusive language.

- Be respectful of different viewpoints and experiences.

- Gracefully accept constructive criticism.

- Focus on what is best for the community.

- Show courtesy and respect towards other community members.

Read the full Code of Conduct:
https://alexslemonade.github.io/reproducible-research/code-of-conduct.html

If you at any time feel harassed or treated inappropriately, please contact [ccdl@alexslemonade.org.](mailto:ccdl@alexslemonade.org)
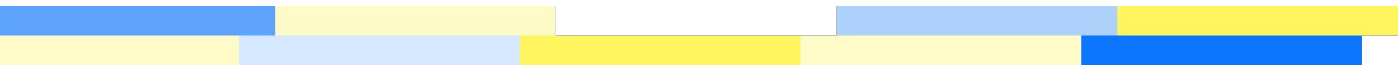
# COVID-19 Safety Policy

With the goal of keeping everyone safe, healthy, and comfortable, we will comply with ALSF's COVID-19 safety policy during the workshop.
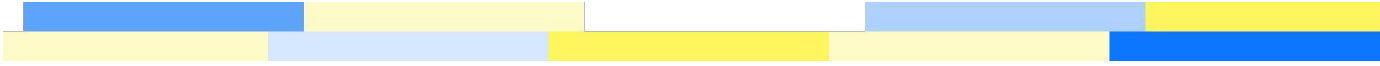
- Everyone is required to wear a surgical or respirator mask in the meeting room. Extra surgical masks are available!
- Hand sanitizer is available and HEPA filters are being used.
- Weather permitting, we will have our lunch break outside.
- If you are not feeling well, please do not stay for the entirety of the workshop. We will not withhold refunds or reimbursements if you must leave for this reason.

Read the COVID-19 policy and other participant information here:
https://alexslemonade.github.io/reproducible-research/participant_information.html

# What you will learn (and what you won't)

# What you will learn

We will cover some common practices for reproducible computational research, including:

- Organizing your projects, including data, code, and documentation

- Navigating your computer from the command line interface

- Tracking and automating your work with scripts

- Making your code more readable, robust, and reusable

- Maintaining and tracking changes in your projects and code over time with git and GitHub

- Managing and tracking software and package versions for improved reproducibility

**Our overarching goals:** To introduce principles and techniques to achieve reproducible results in computational cancer research and to show you commonly-used approaches that you can apply to increase the impact of your research!
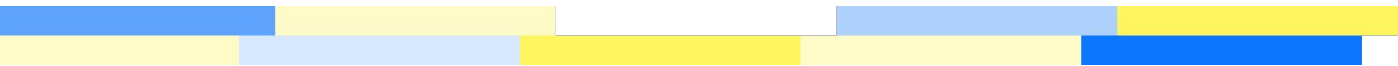
# What you won't learn

We won't have time to cover:

- How to program in specific languages such as R or Python

- All the features and foibles of git and GitHub

- Workflow management systems such as CWL, Snakemake, or Nextflow

# Schedule

| | |
|---|---|
| **9:00 - 10:15 am** | Welcome and introductions |
| **10:15 - 10:45 am** | Organizing your projects and files |
| **10:45 - 11:00 am** | Coffee break |
| **11:00 - 11:45 am** | Intro to UNIX and the command line |
| **11:45 - 12:30 pm** | Intro to git<br>Forking and cloning a repository |
| **12:30 - 1:15 pm** | Lunch |
| **1:15 - 2:00 pm** | Shell scripting |
| **2:00 - 2:30 pm** | The "stage/commit/push" git cycle<br>`.gitignore` files |
| **2:30 - 2:45 pm** | Coffee break |
| **2:45 - 3:15 pm** | Scripts, notebooks, literate programming |
| **3:15 - 3:45 pm** | Managing package versions with `renv`<br>Working with branches in git |
| **3:45 - 4:15 pm** | Documenting your projects |
| **4:15 - 5:00 pm** | Discuss your projects with us |
| **7:00 pm** | Optional dinner |

Full schedule:
https://alexslemonade.github.io/reproducible-research/workshop-schedule.html

# Workshop Structure

## Instruction

- Full group
- Lectures
- Exercises

- Introduce concepts
- Hands on exercises
- Answer general questions

## Open Discussion Time

- Full group
- Potentially smaller groups or 1:1 time, as needed

- Ask questions of instructors and other participants
- Discuss your own work and address problems you may be encountering

# We want your feedback!

- Keep an eye out for our survey, which you will receive via email after the workshop ends. We value your honest feedback!

# Stay in touch! slack

- You have been added to the **#reproducible-research-practices** Slack channel.
- Post public questions, share tips, make comments, and help your fellow participants. We encourage you stay in touch with the Data Lab team and others on Slack after the workshop ends!