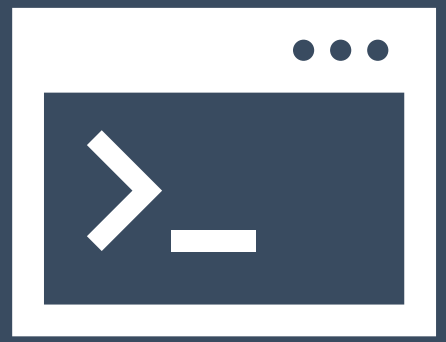
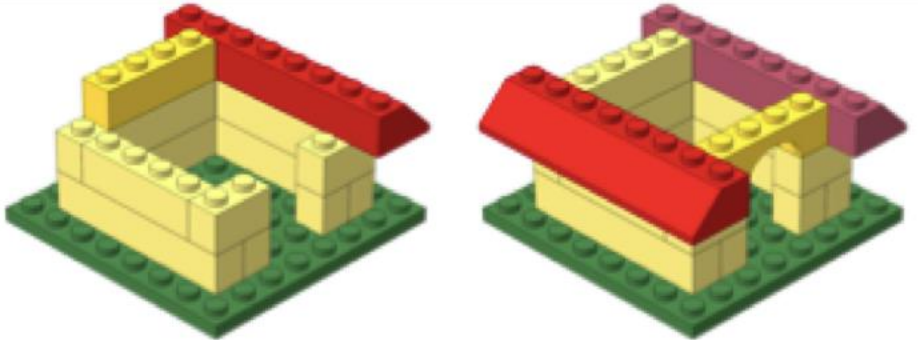
Introduction to Single-cell RNA-seq analysis

https://tinyurl.com/hbc-scrnaseq-online



Harvard Chan Bioinformatics Core

Workshop Scope

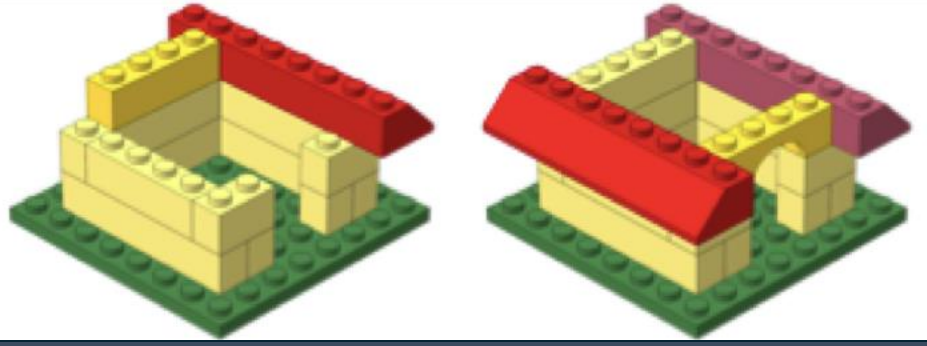


- Describe best practices for designing a single-cell RNA-seq experiment
- Describe steps in a single-cell RNA-seq analysis workflow
- Use Seurat and associated tools to perform analysis of single-cell expression data, including data filtering, QC, integration, clustering, and marker identification
- Understand practical considerations for performing scRNA-seq, rather than in-depth exploration of algorithm theory

Exit survey

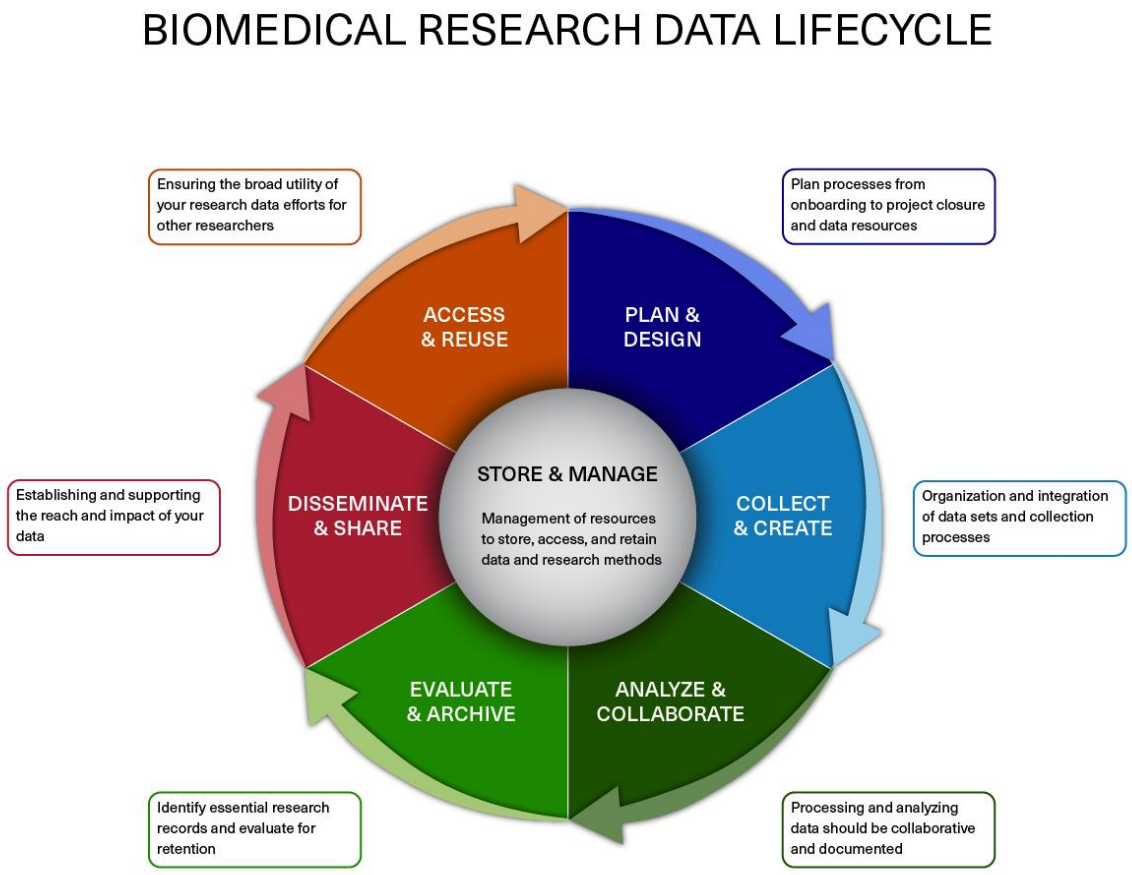
https://tinyurl.com/scRNAseq-online

Useful resources



- **Computational packages for single-cell analysis:**
  - http://bioconductor.org/packages/devel/workflows/html/simpleSingleCell.html
  - https://satijalab.org/Seurat/
  - https://scanpy.readthedocs.io/
  - https://github.com/seandavi/awesome-single-cell
- **Online courses:**
  - https://hemberg-lab.github.io/scRNA.seq.course/
  - https://github.com/SingleCellTranscriptomics
- **Resources for scRNA-seq Sample Prep:**
  - https://www.protocols.io/
  - https://support.10xgenomics.com/single-cell-gene-expression/sample-prep
  - https://community.10xgenomics.com/

Research Data Management (RDM)



Better RDM practice benefits you

- **HMS Data Management LMA**
  - **Webpage:** https://datamanagement.hms.harvard.edu
  - **Sign up for quarterly email updates**
- **Harvard-wide Research data Management**
  - https://researchdatamanagement.harvard.edu/

Spring 2025 Data Lifecycle Training

Plan & Design

February 11
Data Management Offboarding for Research Projects

March 19
A Guide to Efficient Research Practices

March 26
Tips and Tricks for Writing an Actionable Data Management Plan

May 21
Research Data Stewardship Basics

Collect & Analyze

January 29
Data Literacy: Introduction to GIS

February 19
Foundations in R

March 19
Reproducible Research using RMarkdown

April 16
An Introduction to Git and GitHub

May 21
Managing Conflicts on GitHub

Store & Evaluate

March 10
Introduction to the General Records Schedule

April 7
Managing Paper Records: Off-Site Records Storage

April 21
Managing Electronic Records: Shared Drives and Emails

Share & Publish

February 27
Research Management: Open Access Publishing

April 9
Research Management: Closing Out Your Research

April 23
Data Sharing with Harvard Dataverse

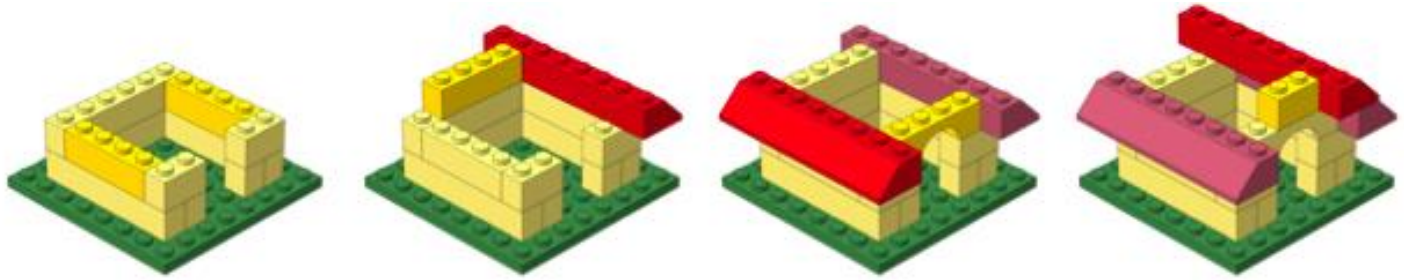
In-person
Virtual

LONGWOOD
RESEARCH DATA MANAGEMENT

Learn More & Register
bit.ly/rdmwg-calendar

https://datamanagement.hms.harvard.edu/about/news-events/rdmwg-calendar

Keep building!

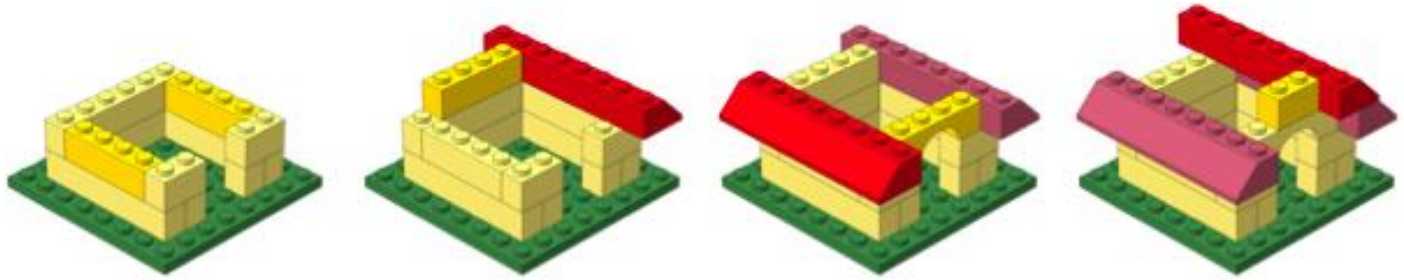


2025 schedule:

Topic	Pre-requisites	Date/Time	Time	Registration
Reproducible Research using Rmarkdown	R basics	3/19/25	1 - 4 pm	Register now!
"Track Changes" for Your Code: an Introduction to Git and GitHub	None	4/16/25	1 - 4 pm	Register now!
Coding with Others: Managing Conflicts on GitHub	“Track Changes” for your code: An Introduction to Git and GitHub	5/21/25	1 - 4 pm	Register now!

https://bioinformatics.sph.harvard.edu/current-bioinformatics-topics-workshops

Keep building!



Topic	Category	Date	Duration	Prerequisites
Introduction to Differential Gene Expression Analysis	Advanced	March 18, 21, 25, 28	Four 2h sessions	R
Pseudobulk and related approaches for scRNA-seq analysis	Advanced	April 4, 8, 11	Three 2.5h sessions	R
Shell for Bioinformatics	Basic	April 22, 25, 29	Three 2.5h sessions	None
Investigating chromatin biology using ChIP-seq and CUT&RUN	Advanced	May 2, 6, 9	Three 2.5h sessions	Shell for Bioinformatics
Introduction to R	Basic	May 20, 23, 27, 30	Four 2h sessions	None
Peak Analysis	Advanced	June 17, 20, 24	Three 2.5h sessions	R

https://bioinformatics.sph.harvard.edu/upcoming-workshops

Talk to us early!

Involvement in study design to optimize experiments

Thanks!

- **Dr. Arpita Kulkarni** – Associate Director, HMS Single Cell Core

More Information

- *HBC training materials: https://hbctraining.github.io/main*
- *HBC website: http://bioinformatics.sph.harvard.edu*

Contact Us

Sign up for our mailing list:

https://tinyurl.com/hbc-training-mailing-list

- *HBC training team:* hbctraining@hsph.harvard.edu
- *HBC consulting:* bioinformatics@hsph.harvard.edu