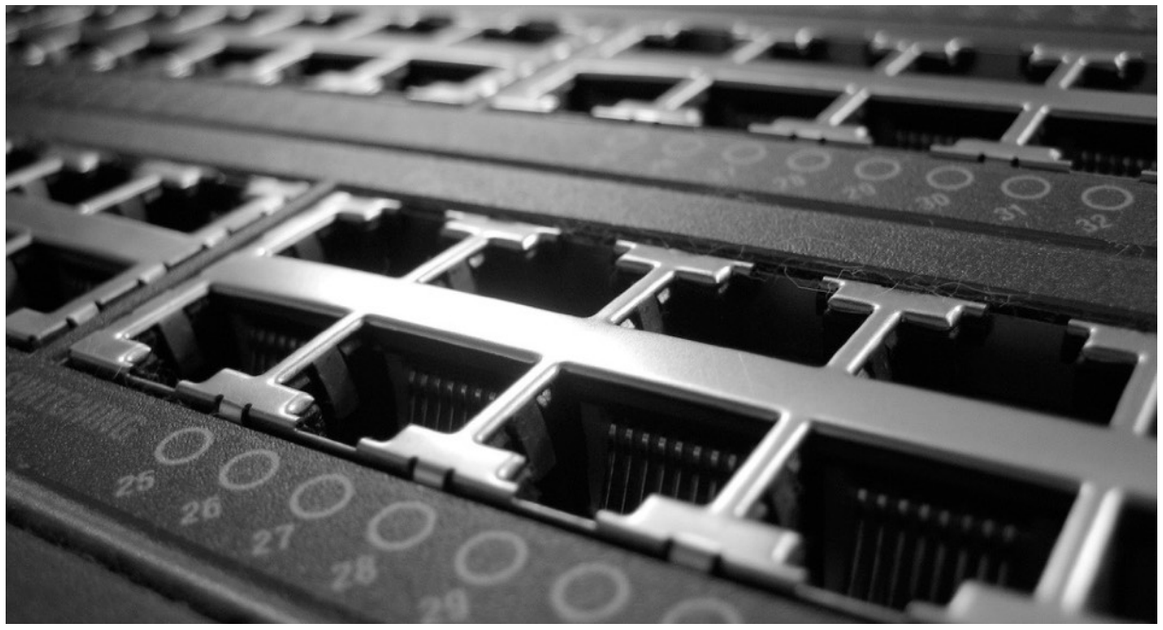


Introduction to RNA-seq using High-Performance Computing (HPC)

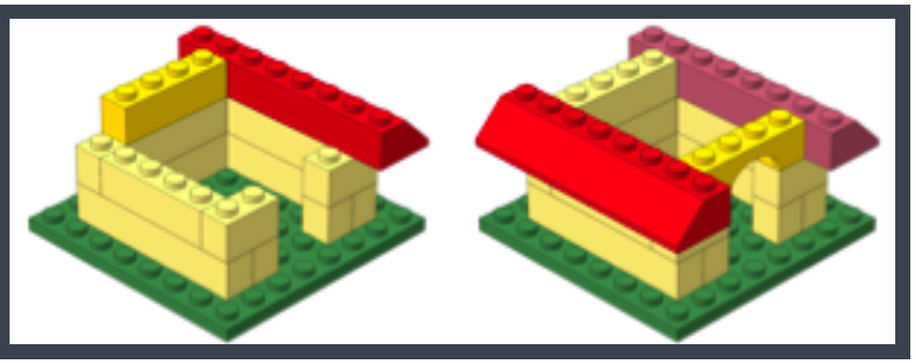
Harvard Chan Bioinformatics Core

in collaboration with

HMS Research Computing

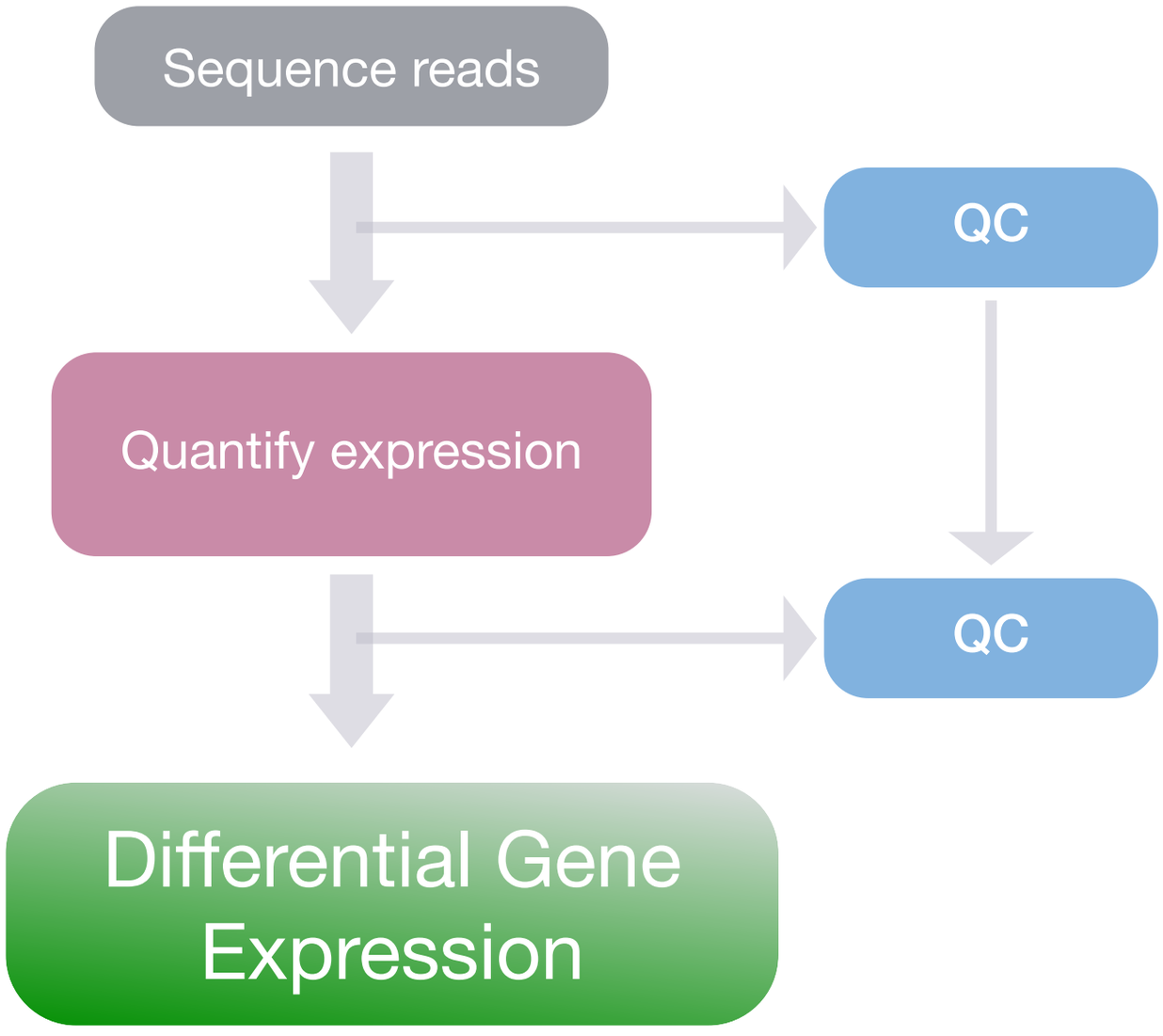
https://tinyurl.com/hbc-rnaseq

Learning Objectives

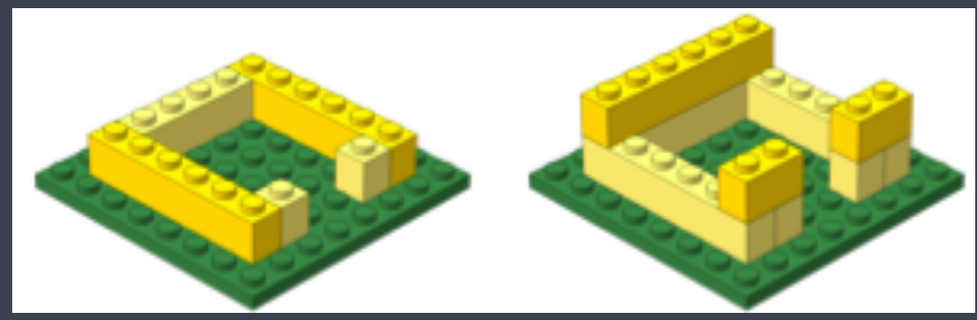


- ✓ Describe best practices for designing a bulk RNA-seq experiment
- ✓ Describe steps in an RNA-seq analysis workflow (from sequence data to expression quantification).
- ✓ Implement shell scripts on a high-performance compute cluster to perform the above steps.

What's next?


Sequence reads
QC
Quantify expression
QC
Differential Gene Expression

What’s next?



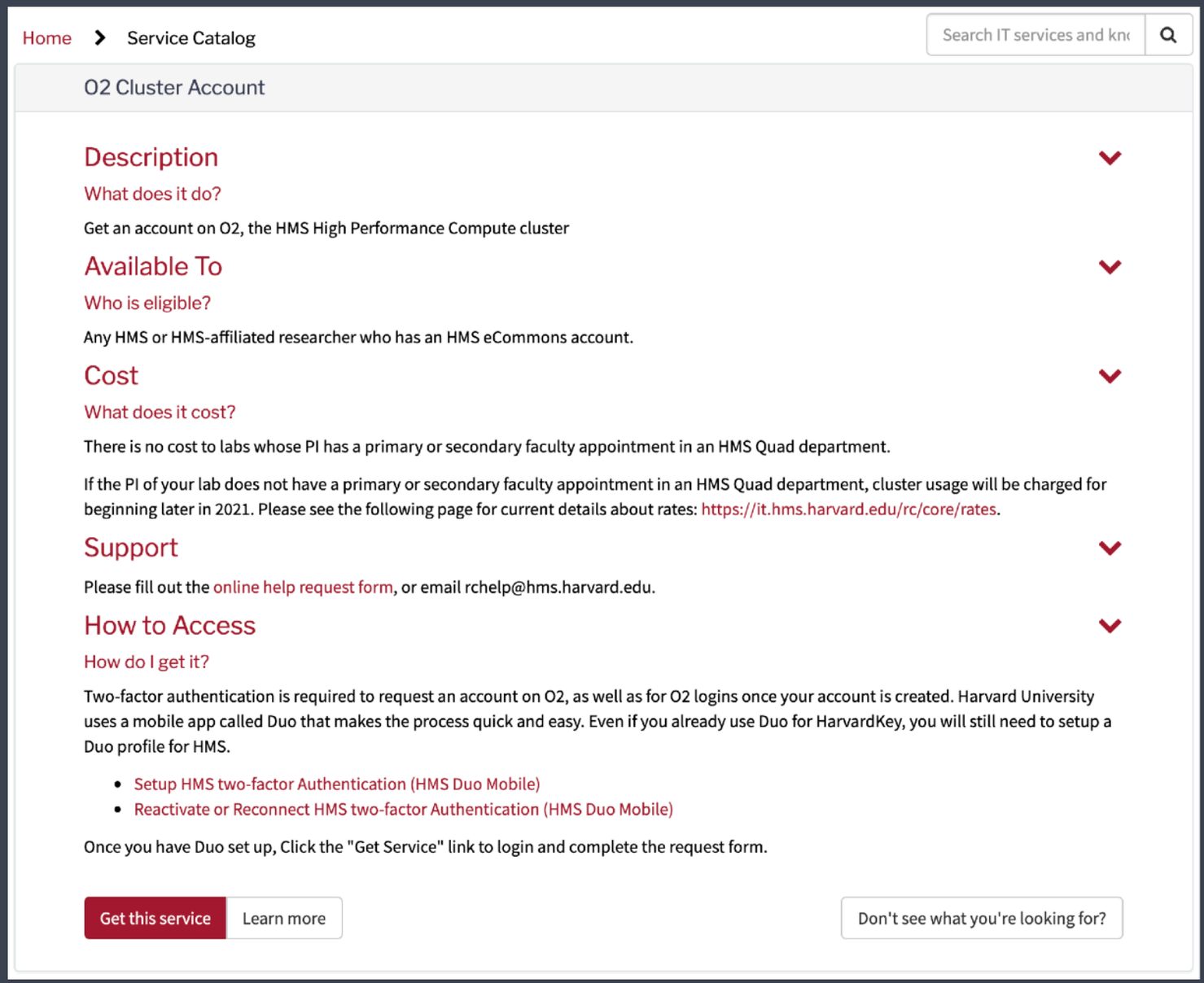
Topic	Category	Date	Duration	Prerequisites
Bulk RNA-seq (Part 1 - FASTQ to counts)	Advanced	March 29, April 2, 5	Three 2.5h sessions	Shell
Introduction to R	Basic	April 9, 12, 16, 19	Four 2h sessions	None
Introduction to Differential Gene Expression (DGE) analysis	Advanced	April 30, May 3, 7, 10	Four 2h sessions	R
Introduction to Command line interface and HPC (Shell)	Basic	May 17, 21, 24	Three 2.5h sessions	None

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

Your feedback matters!

https://tinyurl.com/hbc-rnaseq-exit

How to request an O2 account?



Home > Service Catalog

Search IT services and kn

O2 Cluster Account

Description

What does it do?

Get an account on O2, the HMS High Performance Compute cluster

Available To

Who is eligible?

Any HMS or HMS-affiliated researcher who has an HMS eCommons account.

Cost

What does it cost?

There is no cost to labs whose PI has a primary or secondary faculty appointment in an HMS Quad department.

If the PI of your lab does not have a primary or secondary faculty appointment in an HMS Quad department, cluster usage will be charged for beginning later in 2021. Please see the following page for current details about rates: https://it.hms.harvard.edu/rc/core/rates.

Support

Please fill out the online help request form, or email rchelp@hms.harvard.edu.

How to Access

How do I get it?

Two-factor authentication is required to request an account on O2, as well as for O2 logins once your account is created. Harvard University uses a mobile app called Duo that makes the process quick and easy. Even if you already use Duo for HarvardKey, you will still need to setup a Duo profile for HMS.

- Setup HMS two-factor Authentication (HMS Duo Mobile)
- Reactivate or Reconnect HMS two-factor Authentication (HMS Duo Mobile)

Once you have Duo set up, Click the "Get Service" link to login and complete the request form.

Get this service | Learn more

Don't see what you're looking for?

Big data? Big computer!
The skill set you need to succeed

https://hbctraining.github.io/Training-modules/

Spring 2024 schedule - Big data? Big computer! The skill set you need to succeed:

Topic	Pre-requisites	Date/Time	Time	Registration
Needle in a Haystack - Finding and summarizing data from colossal files	Basic Shell	4/17/24	1 – 4pm	Register!
Shell Tips and Tricks on O2	Basic Shell	5/15/24	1 – 4pm	Register!

Interested in additional training?

All HBC workshop materials available at:

https://hbctraining.github.io/main

Upcoming relevant courses from our partners at Countway Library

Data Management

- HMS Data management -

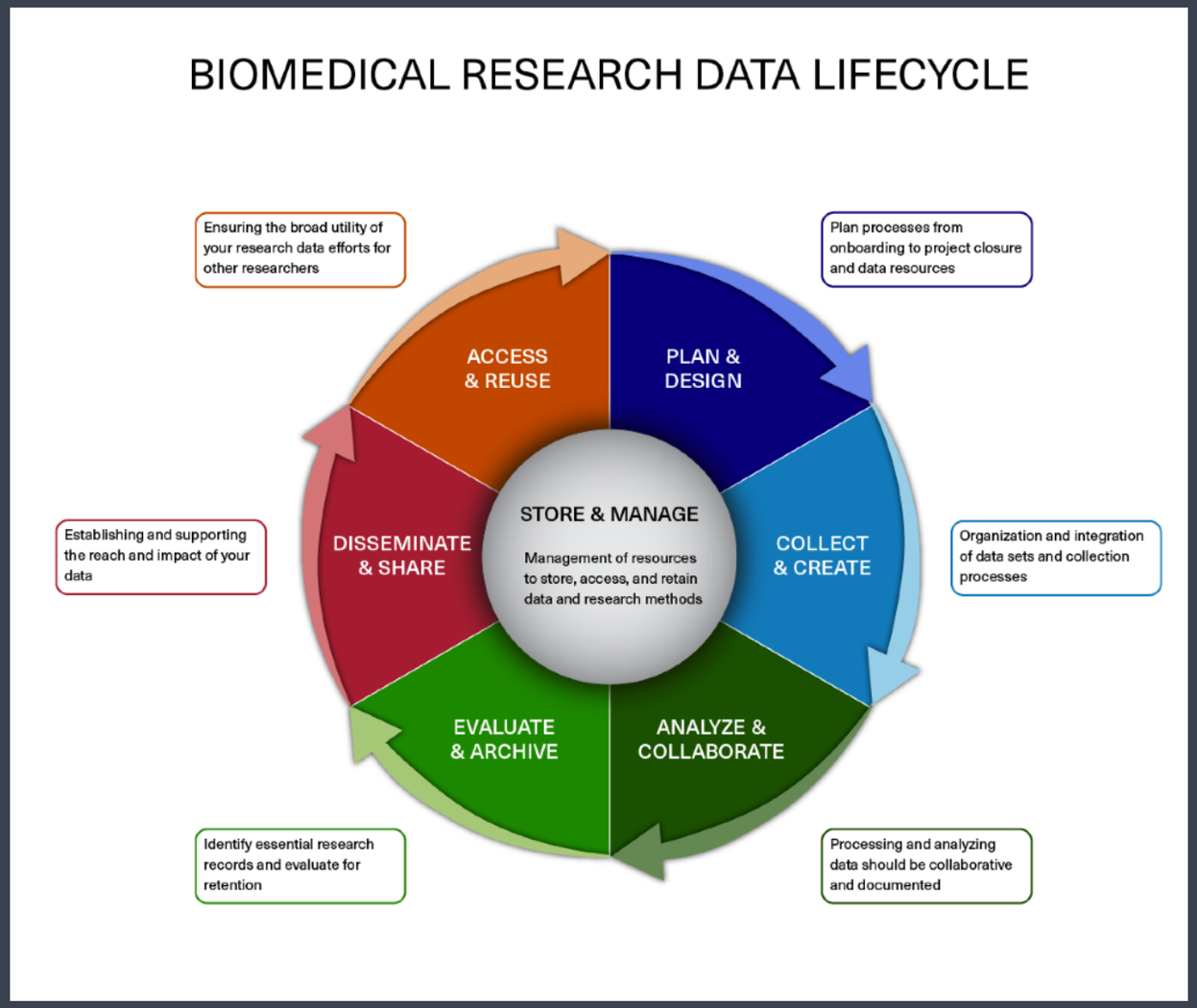
  Webpage: https://datamanagement.hms.harvard.edu/

  Click here to sign up for data management related emails

- Harvard-wide Research Data Management -

  https://researchdatamanagement.harvard.edu/

Data Management Short Workshops



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

Data Management Short Workshops

Spring 2024 Data Lifecycle Training

Plan & Design

April 17
Writing a Data Management and Sharing Plan for Grant Applications

April 24
Principles of Data Stewardship

May 1
Don't Leave Yet! Research Data Offboarding Done Right

May 8
Don't Leave Yet! Research Data Offboarding Done Right

Collect & Analyze

February 21
Basic Shell

March 6
Using Metadata to Find, Interpret & Share Your Data

March 13
Introduction to GIS

March 27
Advanced Data Cleaning for GIS

April 17
Intermediate Shell

May 15
Active Project Version Control with Git

Store & Evaluate

February 7
The When, Where, and How of Data Storage

February 27
Introduction to the General Records Schedule

March 26
Managing Your Paper Records

March 27
Managing Data Transfer Between Collaborators

May 7
Managing Your Electronic Records

Share & Publish

January 16
Data Sharing and Reuse on the Vivli Platform

February 13
Intro to the Harvard Dataverse Repository

February 15
Research Management Using the Open Science Framework

April 10
Achieving FAIR Data: Selecting a Repository for Your Data

In-person Virtual

LONGWOOD
RESEARCH DATA MANAGEMENT

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

Bioinformatics Community Networking Breakfast!

- ***Free and open*** *to the Harvard community*
- *Food is* ***first-come-first-served***
- ***No computers!***
- ***Quarterly*** (Next meeting TBA)

More info: http://bioinformatics.sph.harvard.edu/breakfast/

Thanks!

- Kathleen Chappell and Andy Bergman from HMS-RC
- Data Carpentry

These materials have been developed by members of the teaching team at the Harvard Chan Bioinformatics Core (HBC). These are open access materials distributed under the terms of the Creative Commons Attribution license (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Contact us!

HBC training team: hbctraining@hsph.harvard.edu

O2 (HMS-RC): rchelp@hms.harvard.edu

HBC consulting: bioinformatics@hsph.harvard.edu

Twitter

HBC: @bioinfocore

HMS-RC: @hms_rc