

# Quick Introduction to the Workshop and Core

The **mission** of the Bioinformatics Core facility is to facilitate outstanding omics- scale research through these activities:

Data Analysis

The Bioinformatics Core promotes experimental design, advanced computation and informatics analysis of ‘omics’ scale datasets that drives research forward.

Research Computing

Maintain and make available high-performance computing hardware and software necessary for todays data-intensive bioinformatic analyses.

Training

The Core helps to educate the next generation of bioinformaticians through highly acclaimed training workshops, seminars and through direct participation in research activities.

# UC Davis Bioinformatics Core in the Genome Center

**Core Facility Manager**  
Dr. Matthew Settles

**Faculty Advisor**  
Dr. Ian Korf

**Data Analysis Group**

**Genomics Bioinformatics**

Dr. Joseph Fass  
Dr. Monica Britton  
Nikhil Joshi

**Proteomics Bioinformatics**

**Metabolomics Bioinformatics**

Dr. Jessie Li

**Biostatistics**

Dr. Blythe Durbin-Johnson

**Undergraduate Assistants**

**Research Computing Group**

**System Administration**

Michael Casper Lewis  
Richard Feltstykke

**Database/Web Programming**

Adam Schaal

**Undergraduate Assistant**

# Contacts

- Bioinformatics related questions, include but not limited to  
bioinformatic methods questions, software use, data questions  
[Bioinformatics.core@ucdavis.edu](mailto:Bioinformatics.core@ucdavis.edu)
- Computing Issues, include but not limited to  
User account questions, equipment failure/malfunction, software  
install, software failures (not related to use)  
[helpdesk@genomecenter.ucdavis.edu](mailto:helpdesk@genomecenter.ucdavis.edu)
- Training courses information  
[training.bioinformatics@ucdavis.edu](mailto:training.bioinformatics@ucdavis.edu)

# Goals

- End to End understanding of RNAseq differential expression analysis
- Discussions/lectures
  - Experimental design
  - Cost estimation
  - Technologies
  - Workflow
  - Special topics (more on that later)
- To work through a complete experiment, starting from raw data to completion, including making a few figures.
- Goal is 30-40% lecture/discussion 60-70% hands-on

# Internet

Eduroam, If your home institution is on eduroam, you should be on already

- <http://itcatalog.ucdavis.edu/service/eduroam>

UCD Guest Wireless

- <http://itcatalog.ucdavis.edu/service/wireless-guest-access>

# Workshop materials

Workshop materials posted on github, publicly available

<http://bioinformatics.ucdavis.edu/training/events/>

- Github main page:

<https://github.com/ucdavis-bioinformatics-training>

- This RNAseq Workshop

<https://ucdavis-bioinformatics-training.github.io/2018-June-RNA-Seq-Workshop/>

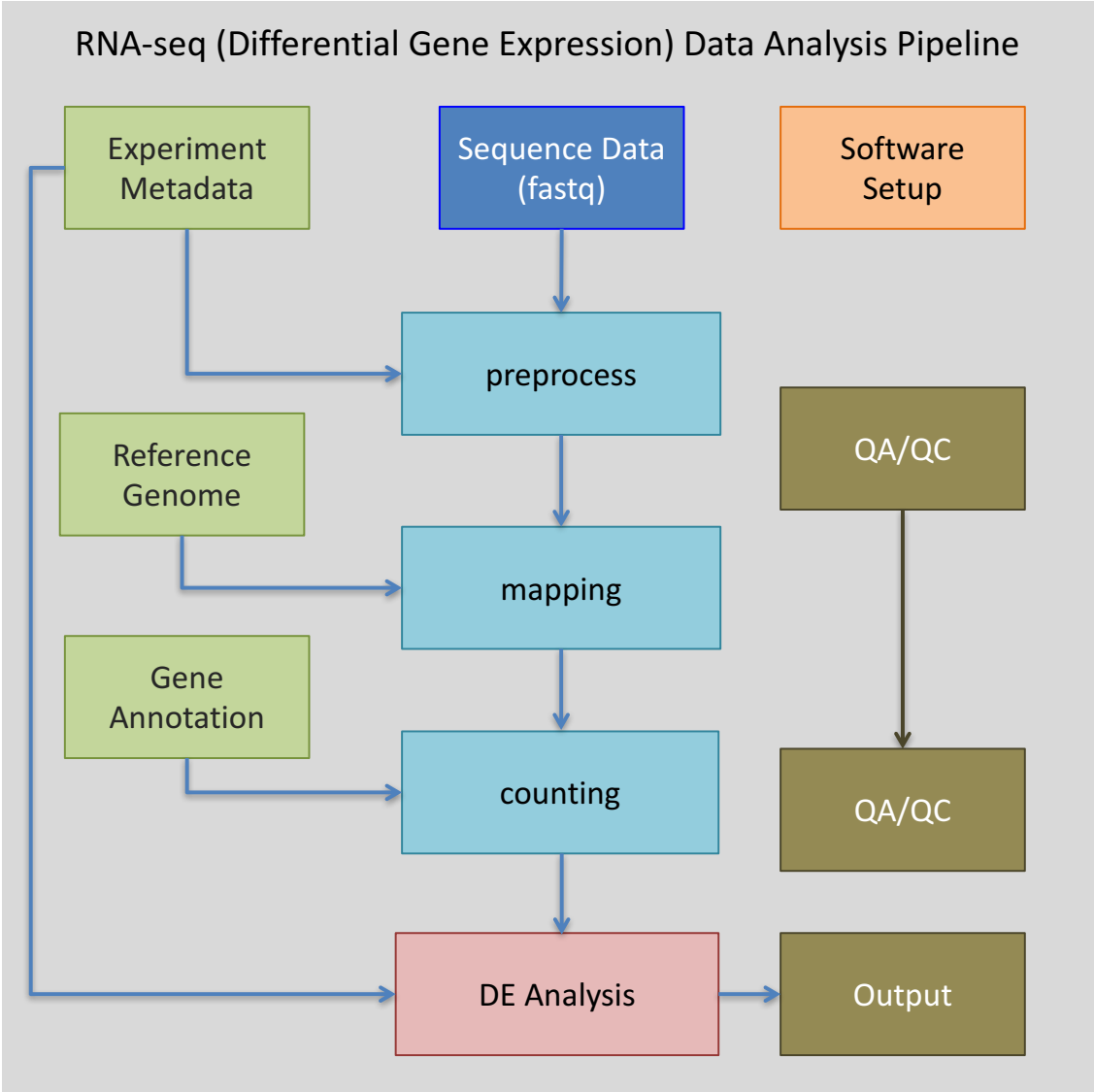
<https://github.com/ucdavis-bioinformatics-training/2018-June-RNA-Seq-Workshop>

# Computing cluster

- Course will be conducted on our servers and compute cluster  
**ganesh.genomecenter.ucdavis.edu**
- Everyone should have a username/password.
  - Recommend you copy to plaintext editor, like notepad (windows) textedit (mac).
- Cluster usage will be under the slurm reservation 'workshop'
  - Reservation will last 1 full week after the workshop and allow you to practice or run analyze your own data.

**workshop    ACTIVE    2018-06-17T00:00:00    2018-06-30T00:00:00    13-00:00:00**

# RNA-seq pipeline overview



# Schedule at a glance

- Monday
  - Morning – computing
  - Afternoon – cluster usage
- Tuesday
  - Morning – genome technology talk / ‘data’
  - Afternoon – preprocessing data
- Wednesday
  - Mapping/counting/visualizing
- Thursday
  - Morning – Intro to R
  - Afternoon – Differential expression analysis
- Friday
  - Morning – Enrichment Analysis
  - Afternoon – Figures

# Industry Lunch Sponsors



Tuesday



Wednesday



Thursday

# Additional Lectures – as time is available

- What is Bioinformatics
- Single-cell transcriptomics
- Spatial transcriptomics
- TagSeq vs standard RNAseq
- Bacterial RNA sequencing
- Transcriptome assembly

<https://goo.gl/forms/RHPWCVNNZT25xNjG3>