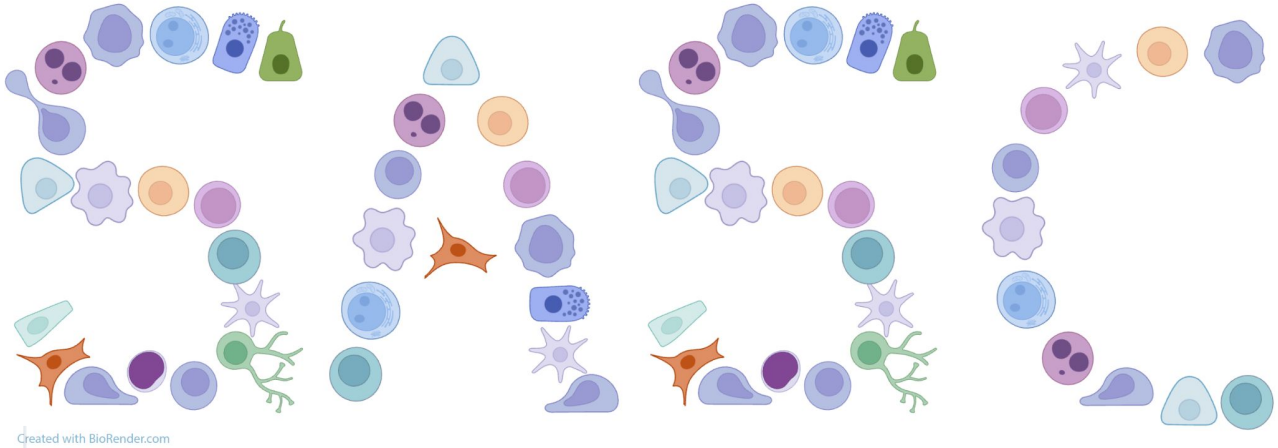
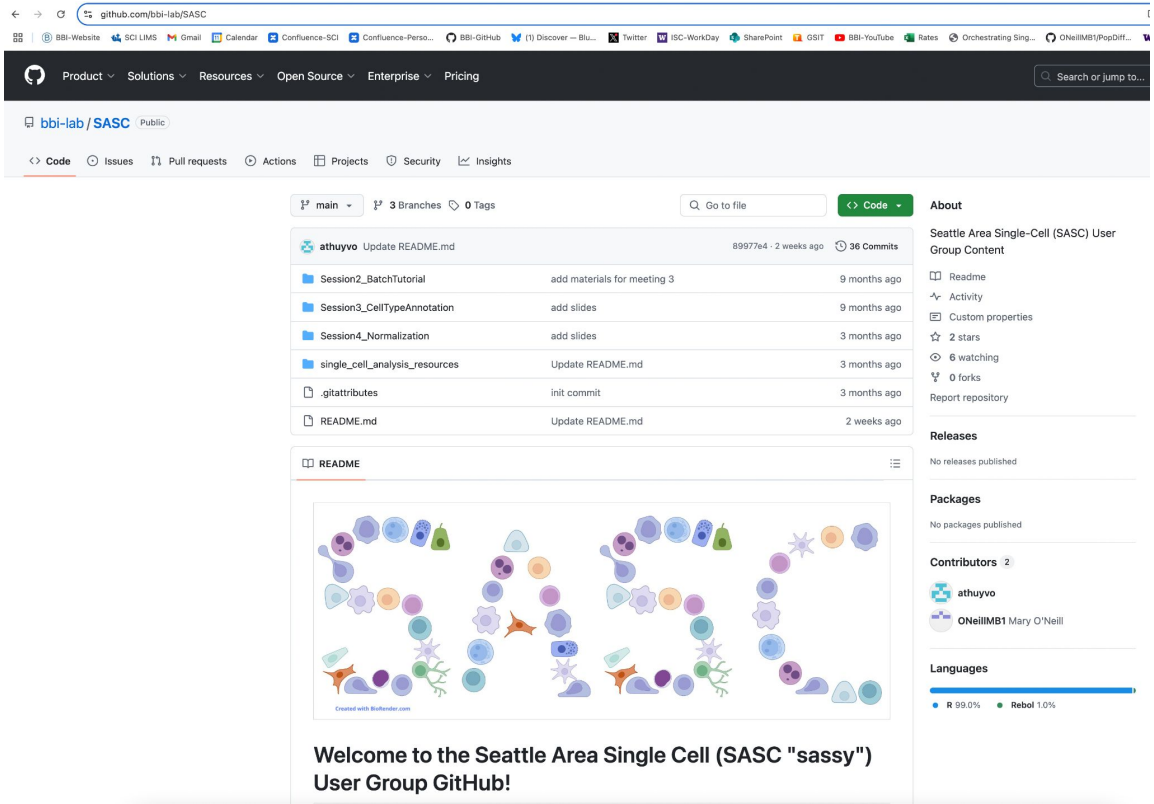
Welcome to



Seattle Area Single Cell (SASC) User Group
June 17, 2025

Github remains our ‘website’



README

About us

As more and more researchers use single cell molecular profiling techniques, there is an outstanding need for a local user group where people can discuss their experiences, exchange ideas, and foster support. The Brotman Baty Institute (BBI) is building upon previous efforts to establish user groups at individual institutes by kicking-off a Seattle Area Single Cell (SASC "sassy") user group that aims to serve members of our three partnering institutions: UW Medicine, Fred Hutchinson Cancer Center, and Seattle Children's. Researchers outside these institutions are also welcome to join. SASC will hold 2h quarterly meetings at rotating locations with the first hour being dedicated to tutorials or method-oriented talks, followed by a social hour to encourage discussion and build community amongst single cell researchers. Please add yourself to our email list if you would like to receive communications related to SASC!

Join our mailing list!

Join the our slack!

Anyone can add themselves!

Stay connected and continue discussions by joining the Fred Hutch Slack workspace, and adding yourself to the `#single-cell` channel.

Discussion slides and workshop materials

All meeting slides, workshop scripts, and related materials are available right here in this GitHub repository. Feel free to explore, download, and reuse!

Want to Lead?

SASC thrives on collaborative learning! We welcome researchers who are interested in leading a session—whether it's a tutorial, workflow demo, or group discussion. Topics should be technology-agnostic and broadly applicable to single-cell projects.

Interested? Reach out to us at sci-help@brotmanbaty.org.

Want to sponsor?

We invite industry partners and innovators to support the Seattle Area Single-Cell User Group meetings -- a quarterly workshop series that brings together researchers, analysts, and technologists working on single-cell related projects across the Seattle area.

Sponsorship is non-recurring and flexible, as we rotate partners each quarter. Your support helps us foster an open and collaborative space for sharing ideas, workflows, and advances in single-cell genomics.

Interested in sponsoring an upcoming session? We'd love to hear from you!

Thanks for Stopping By

We're excited to continue building a collaborative and supportive single-cell community in Seattle. Whether you're a beginner or an expert, there's a place for you at SASC. We welcome your ideas, questions, and participation—see you at the next meeting!

https://mailchi.mp/668c21581425/seattle-area-single-cell-sasc

Special Thanks

Dr Kevin Lin

Fred Hutch Cancer Center

Data Science Lab (DaSL)

Sana Hirata

BROTMAN BATY INSTITUTE

Single Cell Genomics Group

Anh Vo

Everyone Here!

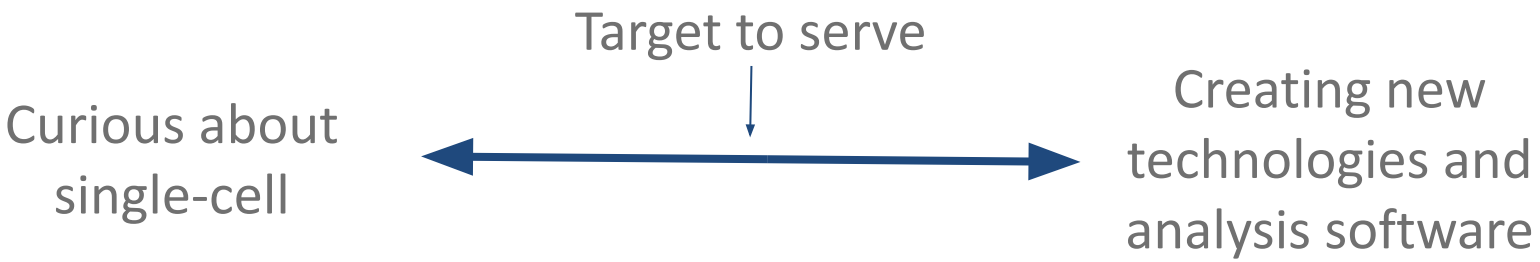
Element Biosciences

(Today's sponsor for refreshments)

Amy Klegarth

SASC Goals

- We are striving for this user group meeting be technology (and software) agnostic
    - **Focus on common challenges**



Disclosures

I do not have any financial relationships to report.

Agenda

- Brief introduction to multi-ome analysis
- Workshop/tutorial
- Networking (remaining time)
    - Refreshments sponsored by Element Biosciences - thank you!

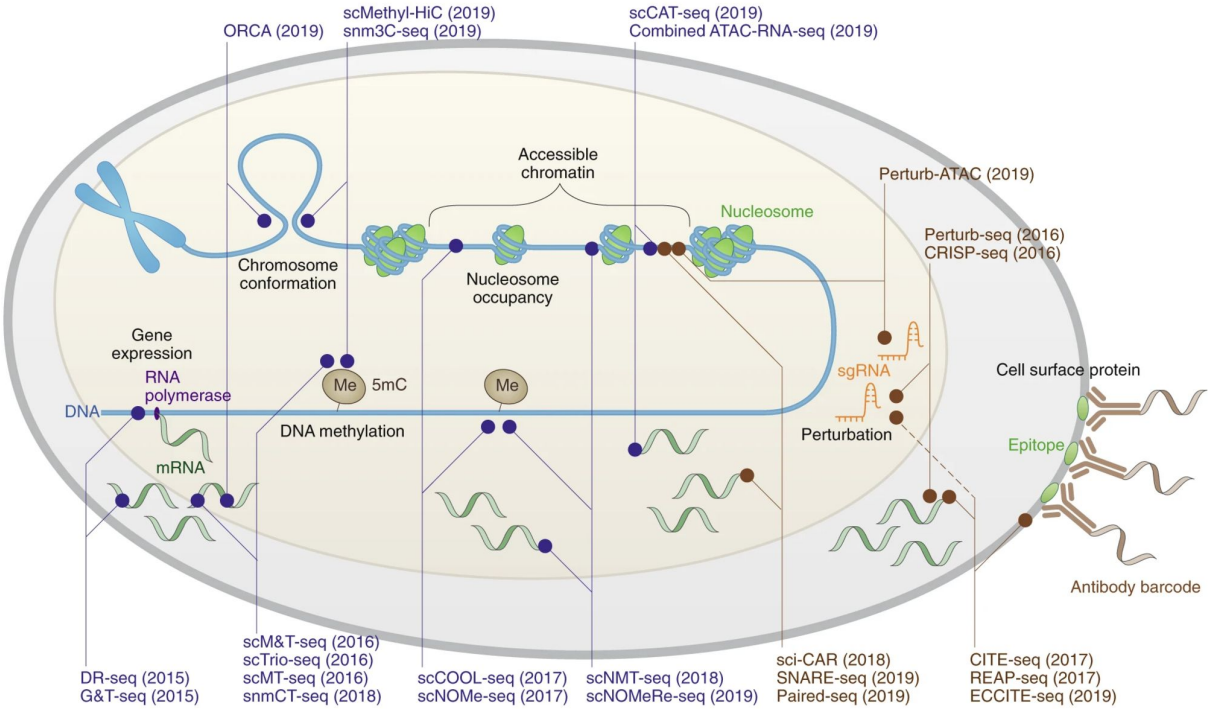
Multiome analysis

Just a few words about myself before we get started:

- My lab at UW Biostatistics: developing new computational methods to study cellular mechanisms to advance our understanding of Alzheimer's disease?
    - Main theme of answering temporal questions: 1) Single-cell sequencing is destructive, and 2) brain tissue is mainly post-mortem

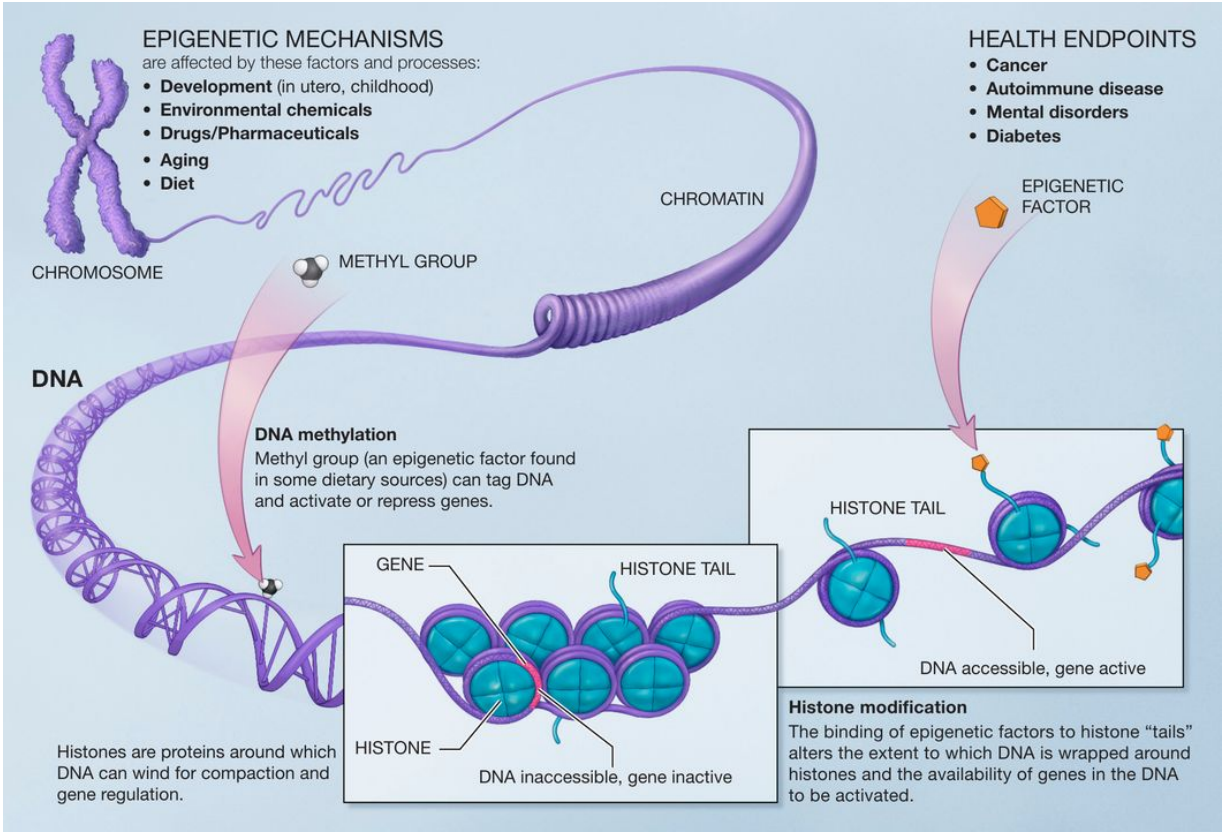
- Much of the content today came from the course I taught (BIOST 545/GENOME 545/PHG 545), which I have volunteers helping convert the course content into Quarto (Bookdown) website over the summer

The wacky world of cell biology



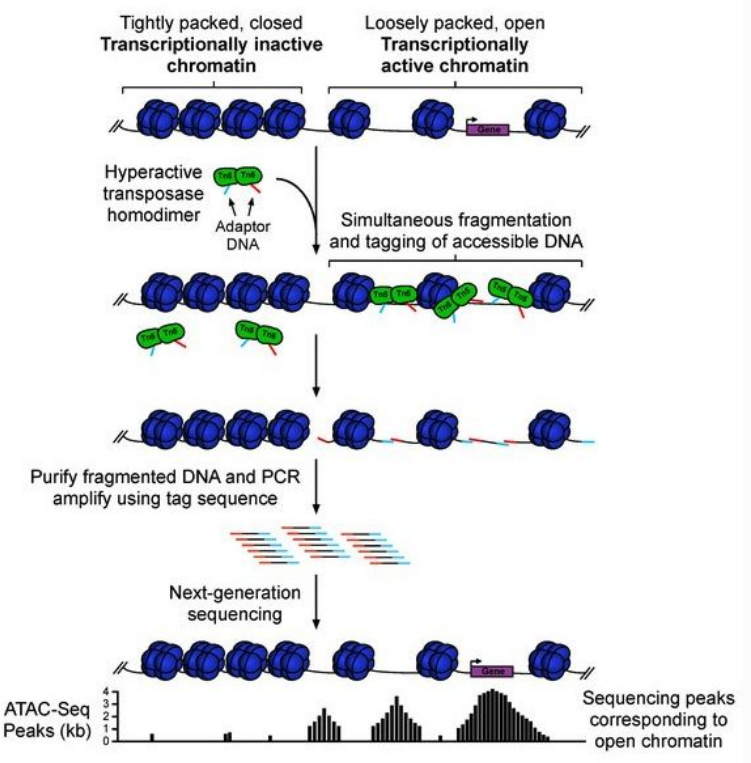
Teichmann and Efremova (2020)

The wacky world of cell biology



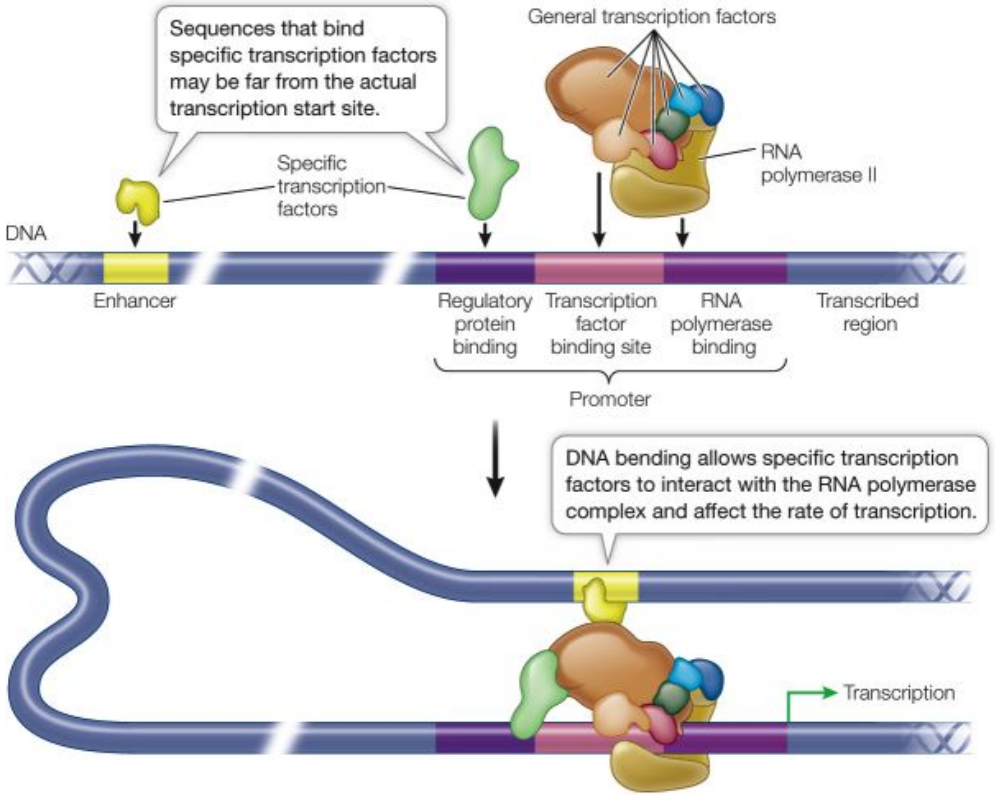
From: https://en.wikipedia.org/wiki/Epigenetics

Accessible DNA



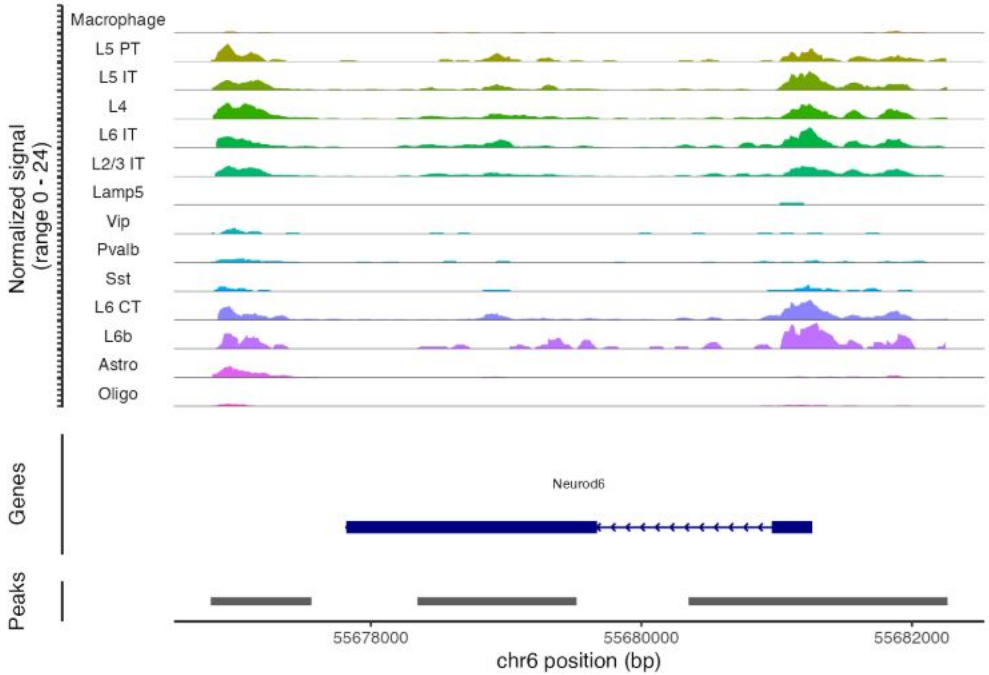
From: https://www.quickbiology.com/ngs-services/atac-seq-service

Transcription factors



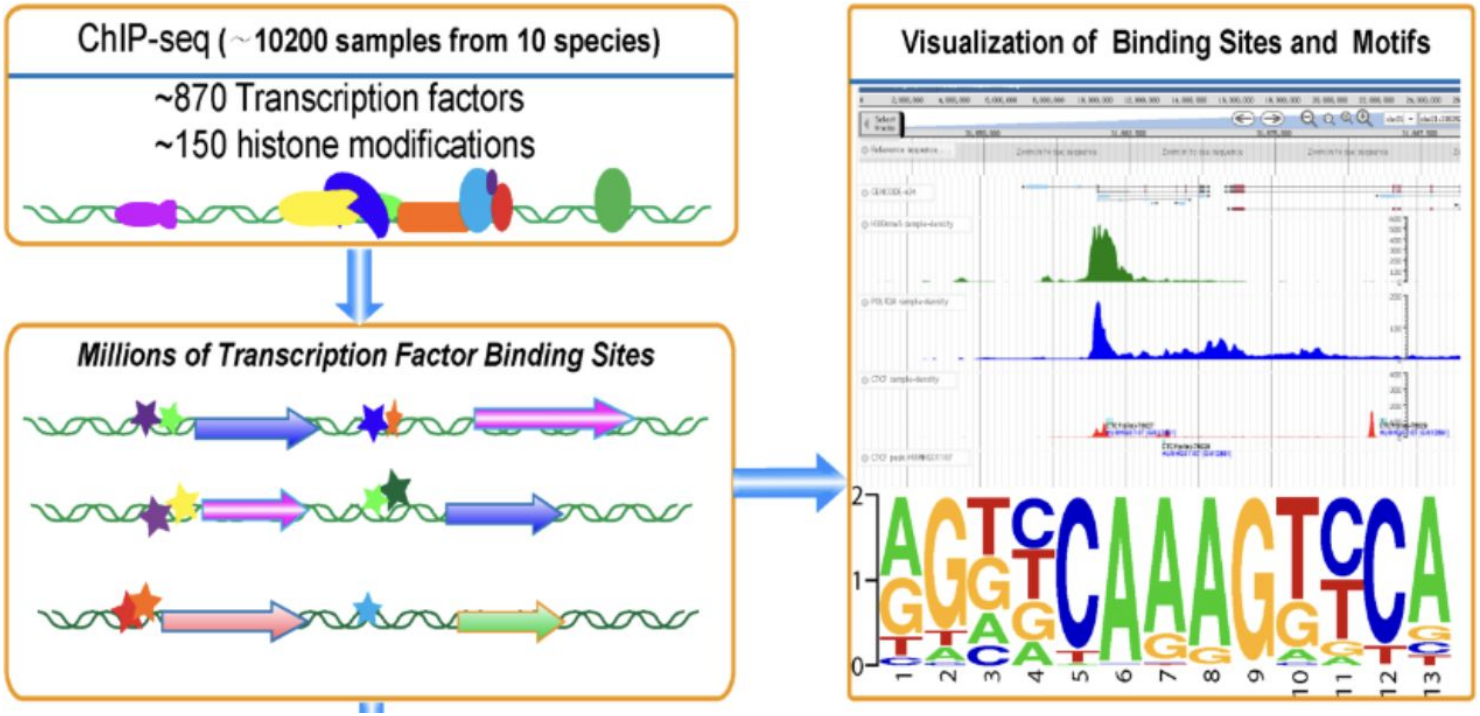
From: https://digfir-published.macmillanusa.com/life11e/life11e_ch16_11.html

What we’re going to cover using ATAC-seq data (Coverage track)



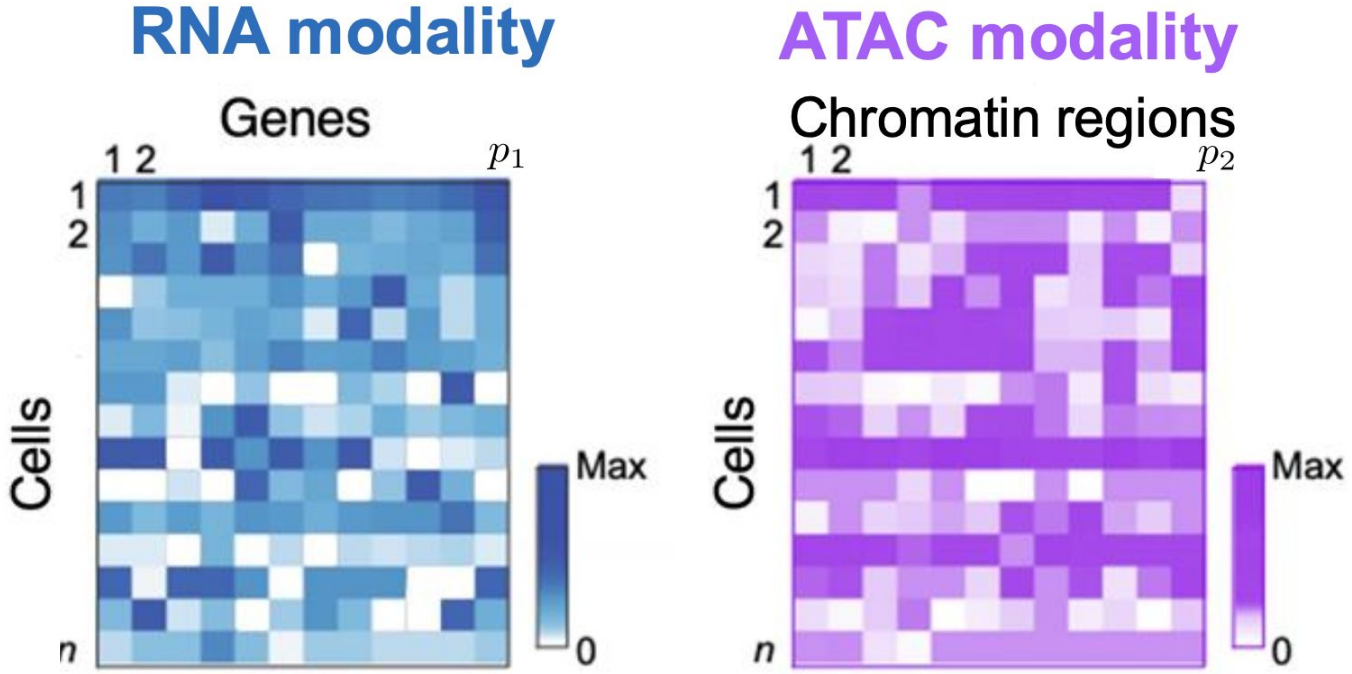
From: https://stuartlab.org/signac/articles/mouse_brain_vignette

What we're going to cover using ATAC-seq data (TF motif)



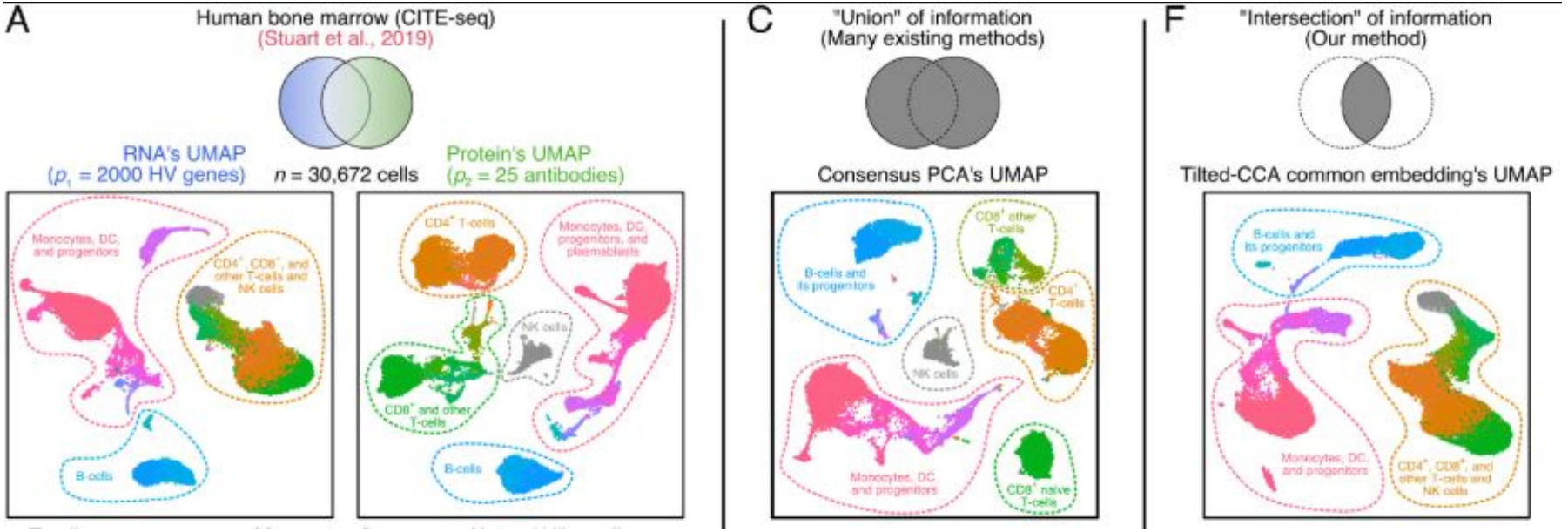
From:
https://www.seqanswers.com/forum/bioinformatics/bioinformatics-aa/59455-transcription-factor-binding-sites-motifs-and-profiles-from-chip-seq-data

Then, what we'll do with multiome data



Same *n* cells, where we have sequence both gene expression ("what programs the cells are using") and DNA accessibility ("what are the switches that turn on/off programs with a time lag")

Then, what we'll do with multiome data (Integration)



Union: Give me a "bird's eye" view of both modalities. (We'll discuss WNN for this.)
Intersection: Tell me what cellular programs are reflected in both modalities, because the complement will tell us what programs in one modality is "invisible" to the other. (We'll discuss Tilted-CCA for this.)

Tutorial

- Scripts: https://github.com/bbi-lab/SASC/tree/main/Session5_ATAC-RNA

Additional datasets:

- http://cf.10xgenomics.com/samples/cell-atac/1.1.0/atac_v1_adult_brain_fresh_5k/atac_v1_adult_brain_fresh_5k_filtered_peak_bc_matrix.h5 (https://tinyurl.com/huznmdnh)

- http://cf.10xgenomics.com/samples/cell-atac/1.1.0/atac_v1_adult_brain_fresh_5k/atac_v1_adult_brain_fresh_5k_fragments.tsv.gz (https://tinyurl.com/58yshx2j)

- http://cf.10xgenomics.com/samples/cell-atac/1.1.0/atac_v1_adult_brain_fresh_5k/atac_v1_adult_brain_fresh_5k_fragments.tsv.gz.tbi (https://tinyurl.com/yu4aw96h)

Element Biosciences - *Thank you for sponsoring refreshments this meeting!*

Teton Atlas OPS 'Grant' due June 20th – just a 250 word blurb to apply – aimed at optical pooled screening, guide RNA sequencing on our low-output kit for in-situ sequencing on adherent cells or cell suspensions.
https://www.elementbiosciences.com/apply-for-the-2025-teton-atlas-global-grant

Coming Next on AVITI24 Blog
https://www.elementbiosciences.com/blog/whats-next-for-aviti24-continued-innovation-for-your-research

Direct In-Situ Sequencing Webinar On-Demand
https://www.elementbiosciences.com/resources/webinar-on-demand-from-sample-to-insight-accelerating-discovery-with-direct-in-sample-sequencing-in-cells

And two pre-prints, one about the technology, the other demonstrating the application in drug testing:

AVITI24 Pre-Print
https://www.biorxiv.org/content/10.1101/2025.05.03.651997v1
TKI Resistance Experiment Pre-Print
https://www.biorxiv.org/content/10.1101/2025.05.06.652479v1