

GVA 2019 Review

Attempts to add perspectives and additional resources.

Reminder of goals and thoughts of how well we met them.

- Participant goals:
 - Learn how to analyze my data, and have it fully analyzed by the end of the class.
 - Learn how to analyze NGS data in general.
- Teaching goals:
 - Teach the fundamentals of NGS variant analysis.
 - Provide context and exposure multiple types of data.
 - Use example commands to familiarize you with variety of programs.
 - Provide resources to enable you to do analysis you haven't thought of yet.

Stages of NGS analysis

1

Biological
Question

2

Design &
Conduct
Experiment

3

Prepare NGS
Library &
Sequence

4

Sequencing
Analysis

4 Typical Stages of Variant Analysis

1

Read Quality
Control

2

Map Reads

3

Identify Variants

4

Visualize Variants

#1 most common question I get asked

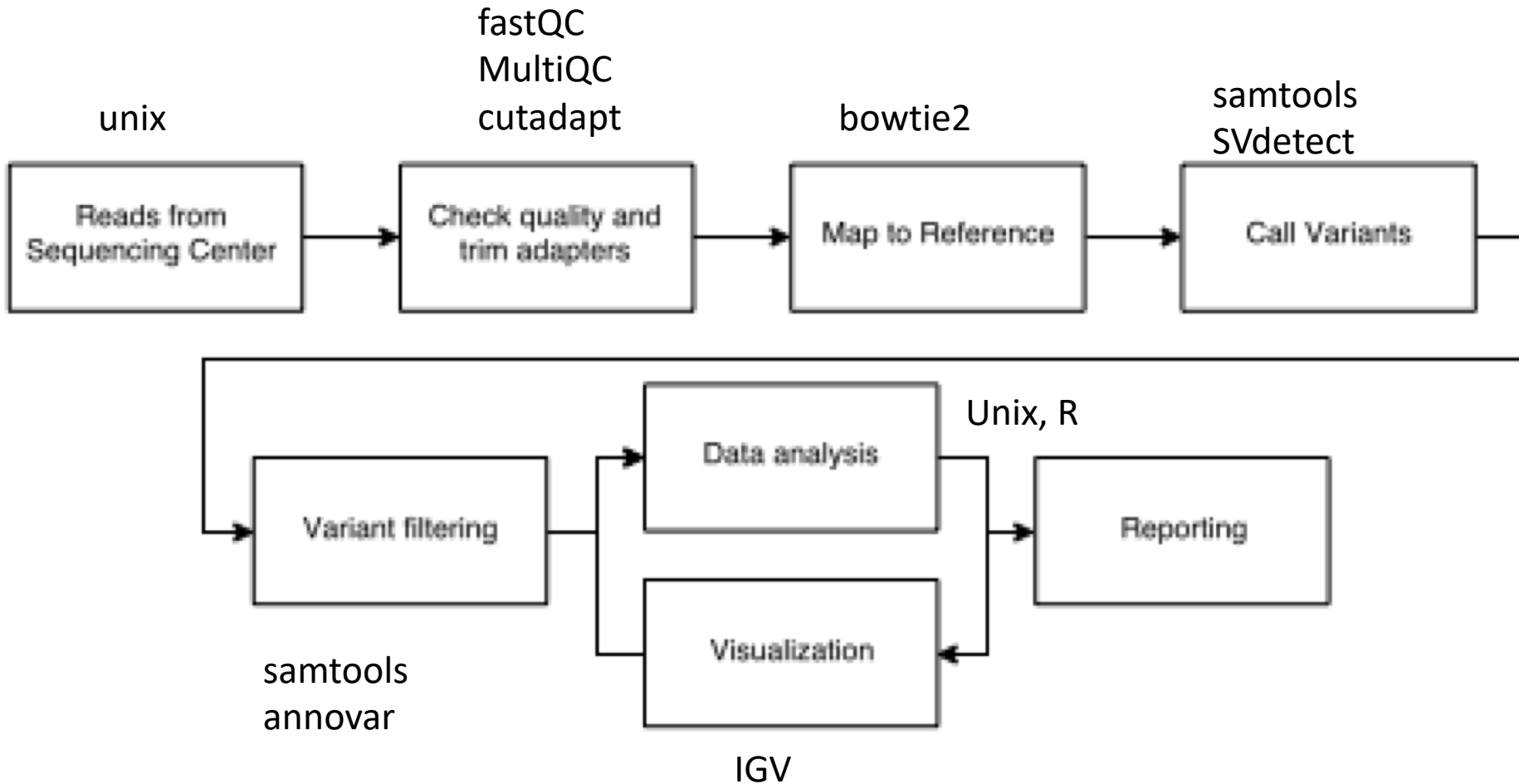
- How much sequencing do I need to do?
 - Most applications 30-50 fold coverage, higher for bacteria/small organisms because they are smaller and cheaper.
- How do I change reads or lanes into coverage?

$$\text{Coverage} = \frac{(\text{Read Length}) \times (\text{Sequencing Type}) \times (\text{Number of Reads})}{\text{Size of Genome}}$$

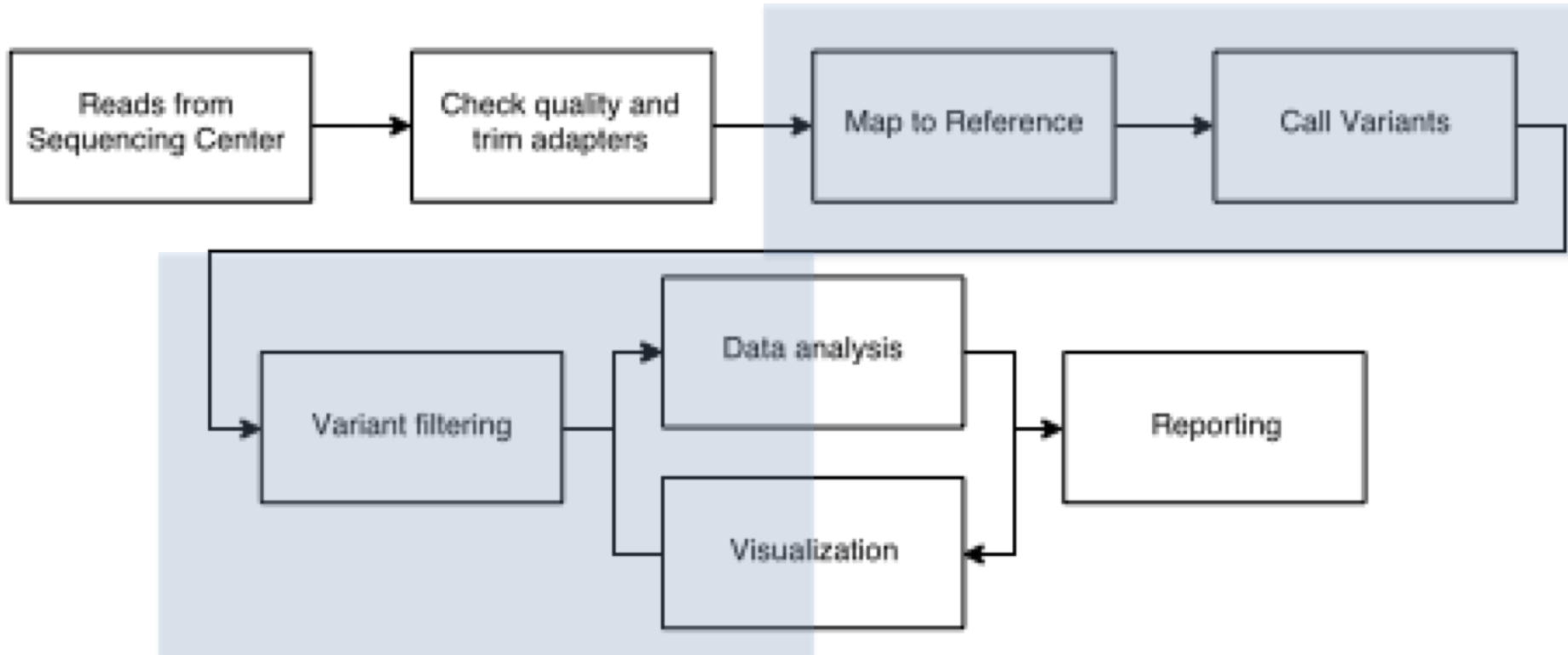
$$30 = \frac{150 \times 2 \text{ (if Pair end or 1 if single)} \times (\text{Number of Reads})}{\text{Size of Genome}}$$

- Number of reads = ~10% of the genome length
 - If PE 150bp run.

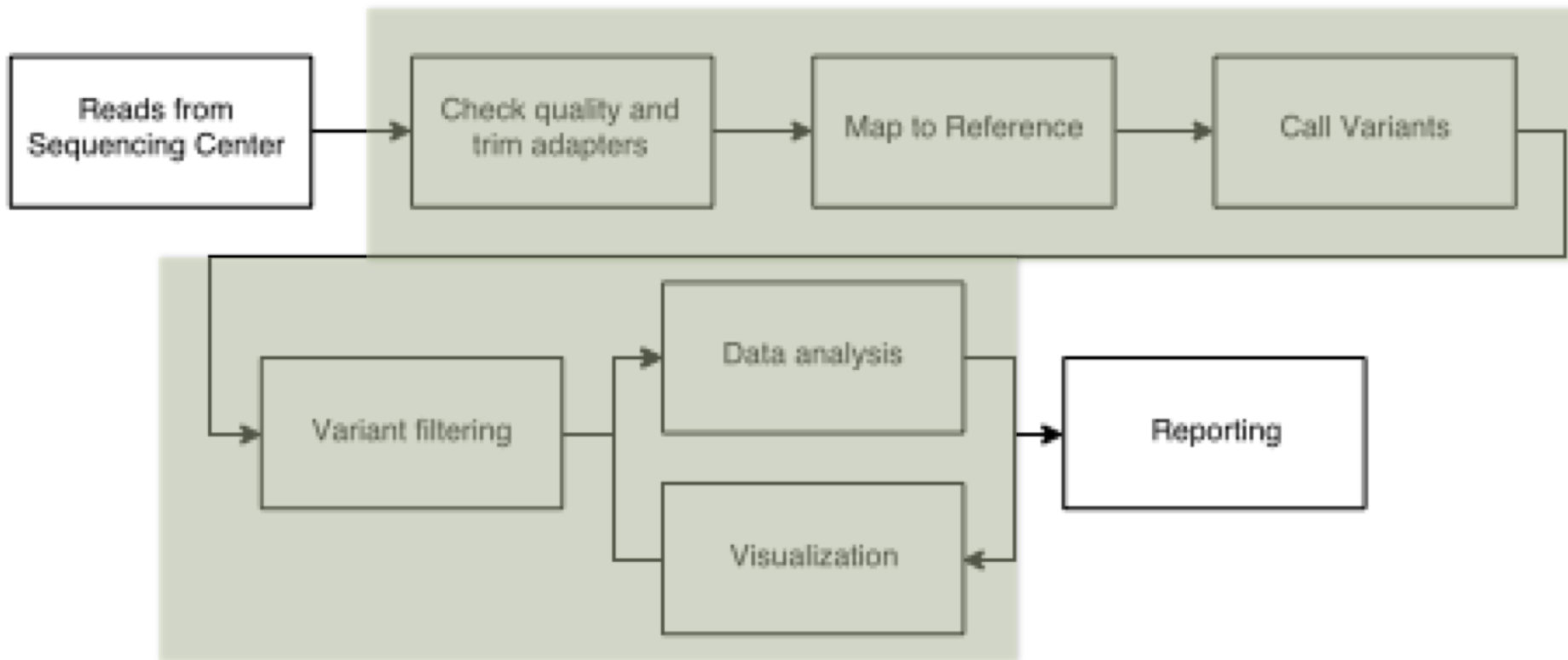
Steps for GVA



microbial all-in-one: breseq



eukaryotic all-in-one: GATK



Further Resources

(online)

- Galaxy : <https://usegalaxy.org>
- Biolteam website (more tutorials, info from other classes):
<https://wikis.utexas.edu/display/bioiteam/Bioinformatics+Team+Home>
- Coursera: Genomic data science :
<https://www.coursera.org/specializations/genomic-data-science>
- Course instructor. You have my email

What's next

- Today, keep working on tutorials
 - Hint hint job submissions!
- Talk to me about what you don't understand about what we have done or why something was important or how it fits together.
- Keep eye out for email from me and from CCBB to review your experience, I really appreciate feedback, it's the only way to make this course better for other people.
- Soon, start analyzing your own data.