

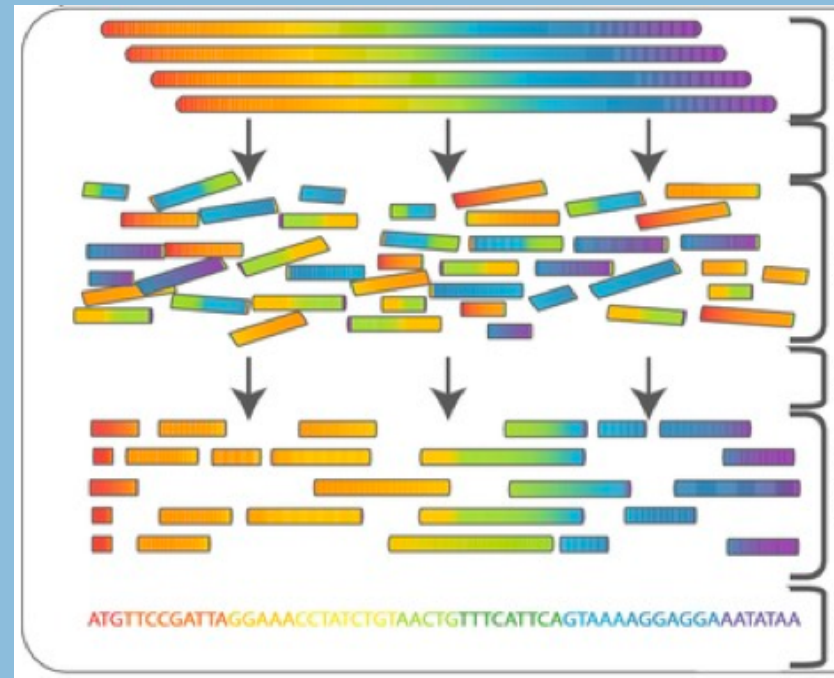
Genome Assembly:

An Activity

--c. ryan campbell

Genome Assembly

- Repeatedly “shotgun” sequencing random fragments of DNA
- Gather enough coverage to assemble all chromosomes of a genome
- Common Problems:
 - Large (mammals ~3 GB)
 - Roughly 5,000 books
 - Chromosomes
 - Repeats



Genome Assembly Activity

- Generated Data/Sequence falls into three categories

Short & Accurate:	Long & Error-prone:	Ultra-long & Coarse
Illumina 100-300bp	PacBio ~2,000-5,000bp	BioNano Hi-C ~100,000-1,000,000bp

- Each has strengths and weaknesses

Directions

- Assemble the “sequence data” in your envelope
- Should make a coherent paragraph from a famous speech
- The text represent sequences generated from NGS machines:
 - Long, error-prone PacBio reads (~75 char)
 - Short, accurate Illumina reads (~16 char)

Genome Assembly “Output”

- Estimate the length of the speech

Group: A B C

- Estimate the number of repeats

Group: A B C

- Estimate text errors

Group: A B C

Final Product

Even though large tracts of Europe and many old and famous States have fallen or may fall into the grip of the Gestapo and all the odious apparatus of Nazi rule, we shall not flag or fail. We shall go on to the end. We shall fight in France, we shall fight on the seas and oceans, we shall fight with growing confidence and growing strength in the air, we shall defend our island, whatever the cost may be. We shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender.

--Winston Churchill

Final Product

Even though large tracts of Europe and many old and famous States have fallen or may fall into the grip of the Gestapo and all the odious apparatus of Nazi rule, **we shall** not flag or fail. **We shall** go on to the end. **We shall fight** in France, **we shall fight** on the seas and oceans, **we shall fight** with growing confidence and growing strength in the air, **we shall** defend our island, whatever the cost may be. **We shall fight** on the beaches, **we shall fight** on the landing grounds, **we shall fight** in the fields and in the streets, **we shall fight** in the hills; **we shall** never surrender.

--Winston Churchill

Thanks!