Intro to Bioinformatics

Lecture 2
Aug 31, 2016

Announcements

- Reading assignments
- Sign up for AWS

Sequencing Platforms

- Oxford Nanopore (@nanopore)

https://www.youtube.com/watch?v=CE4dW64x3Ts
https://youtu.be/btm9lrX1I-Q

Sequencing Platforms

	Illumina	PacBio	ONT
Read Length			
Error Rate			
Throughput			
Expense			

Sequencing Platforms

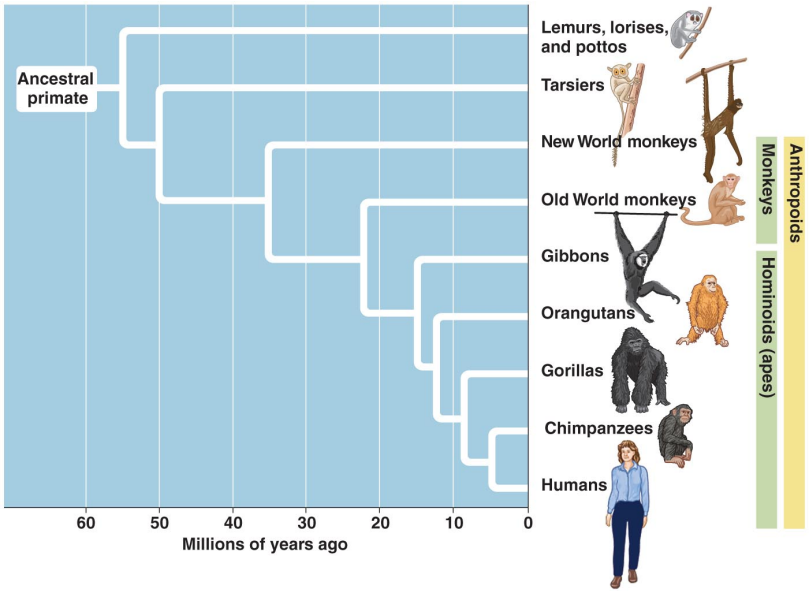
- 454 (@LifeTech)

Sequencing Platforms

- Sanger

Context is Evolution

- Evolution



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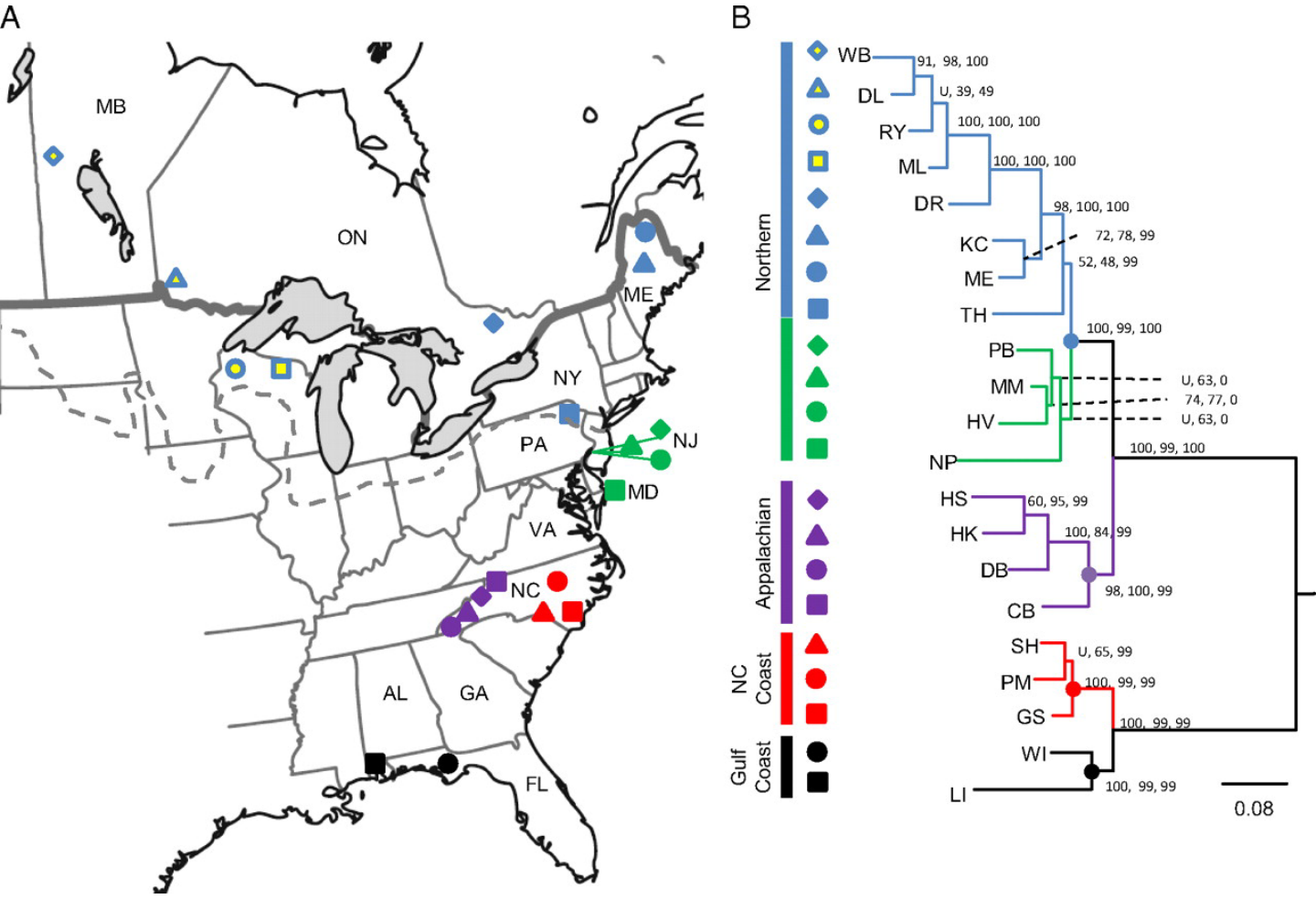
A
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Northern
Appalachian
NC Coast
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WB
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ML
DR
KC
ME
TH
PB
MM
HV
NP
HS
HK
DB
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WI
LI
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100, 99, 100
60, 95, 99
100, 84, 99
98, 100, 99
U, 65, 99
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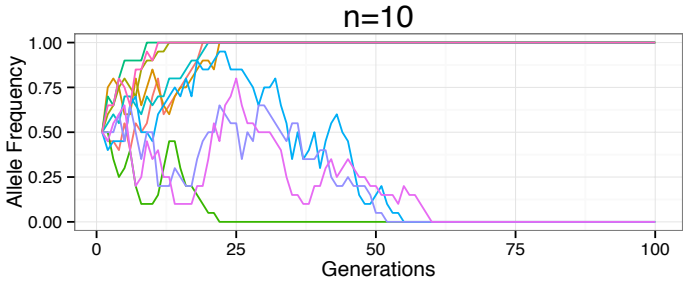
Mechanisms of Evolution

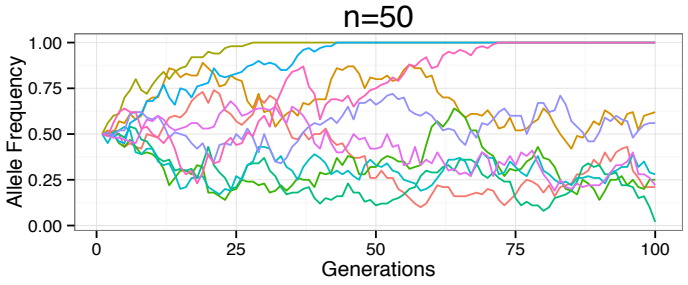
- Gene Flow

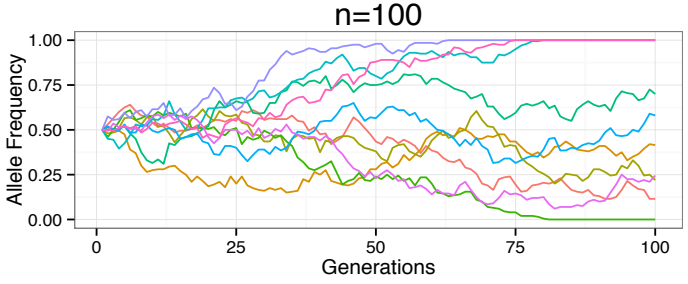
Mechanisms of Evolution

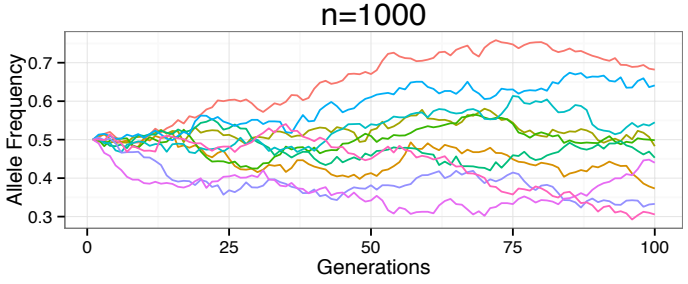
- Genetic Drift

Mechanisms of Evolution









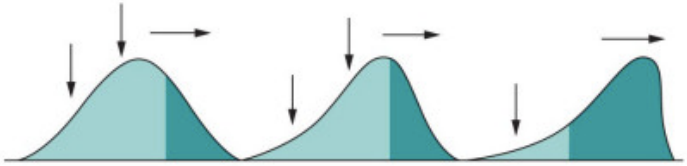
Mechanisms of Evolution

- Mutation

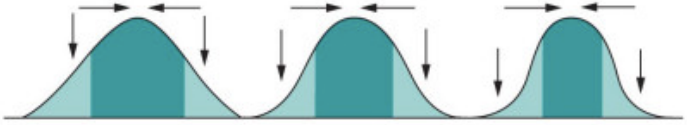
Mechanisms of Evolution

- Natural Selection

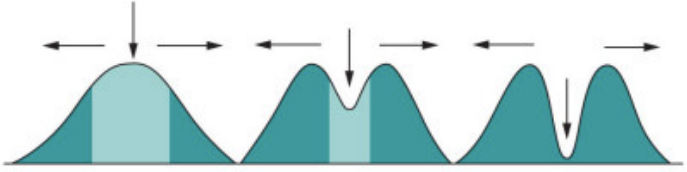
SELECTION



(a) Directional selection



(b) Stabilizing selection



(c) Disruptive selection

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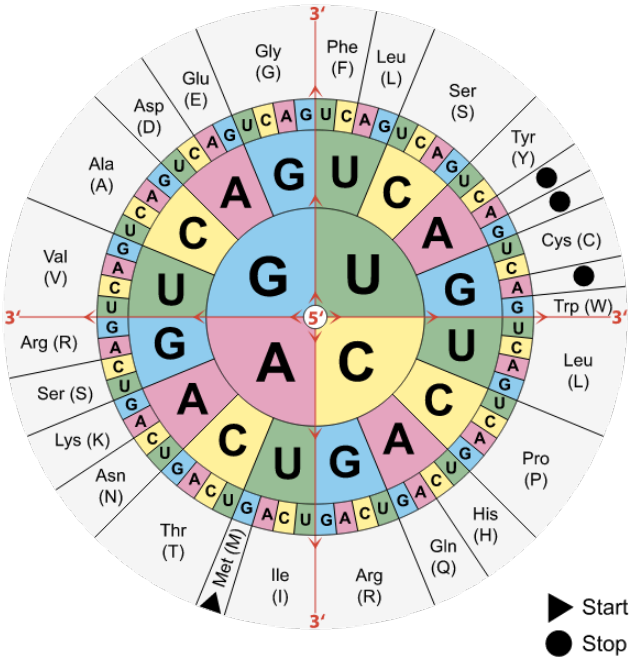
Selection

- Synonymous change

- Non-synonymous

Selection

5′-AUGCAGGCAUGA-3′



Selection

- dN/dS

Finding Data & Pairwise Alignment

Lecture 2
Sept 9, 2014

Finding Data

- Genomics has embraced Open Science & Open Data

Genbank	ENA
Uniprot	dbSNP
Refseq	ClinVar
Swiss-prot	Rdp
Pfam	OMIM
Ensembl	UCSC GB
SRA	

Finding code

- Genomics has embraced Open Science & Open Data

Github
Biostars

Stackoverflow

Pairwise Alignment

- Definition

Pairwise Alignment

- Homologous
  - Paralogous
  - Orthologus

Pairwise Alignment

- Alignment demo:
  - mafft

Pairwise Alignment

- What is aligner actually doing?

Pairwise Alignment

- Scoring Matrices