

# Evolutionary Modes

Positive Selection  
(Diversifying)

$$dS < dN \text{ or } \omega := dN/dS > 1$$

Negative Selection

$$dS > dN \text{ or } \omega < 1$$

Neutral Evolution

$$dS \approx dN \text{ or } \omega \approx 1$$

# Estimating dS and dN

Consider two **aligned homologous** sequences

	<u>Site 1</u>	<u>Site 2</u>	<u>Site 3</u>	<u>Site 4</u>	<u>Site 5</u>	<u>Site 6</u>
<b>DNA</b>	ACA	ATA	ATC	TTT	AAT	CAA
<b>AA</b>	T	I	I	F	N	Q
<b>DNA</b>	ACA	ATA	ACC	TTT	AAC	CAA
<b>AA</b>	T	I	T	F	N	Q