## Evolutionary Modes

Positive Selection (Diversifying)

Negative Selection

Neutral Evolution

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

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

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

## Estimating dS and dN

## Consider two aligned homologous sequences

	Site 1	Site 2	Site 3	Site 4	<u>Site 5</u>	Site 6
DNA	ACA	ATA	A <b>T</b> C		AAT	CAA
AA	T			F	Ν	Q
DNA	ACA	ATA	A <b>C</b> C	TTT	AAC	CAA
AA	T		T	F	Ν	Q