

**WNV NS3**

Model	Log L	# p	dN/dS	LRT	p-value
<i>Null</i>	-7745.48	49	1		
Alternative	-6413.5	50	0.009 [0.007-0.011]	2512.6	~0

*Very strongly conserved*

**HIV-1 env**

Model	Log L	# p	dN/dS	LRT	p-value
<i>Null</i>	-2078.3	40	1		
Alternative	-2078.2	41	1.122 [0.94-1.33]	0.33	~0.6

*Not significantly different from neutral*

**SARS-CoV-2 spike**

Model	Log L	# p	dN/dS	LRT	p-value
<i>Null</i>	-9311.0	176	1		
Alternative	-9292.0	177	0.54 [0.48-0.61]	37.94	~0

*Very strongly conserved*

# Mean gene-wide dN/dS estimates

- Are not the way to go, except when you have very small (2-3 sequence) datasets
- **For example:**
  - The humoral arm of the immune system mounts a potent defense against viral infections
  - Existing successful vaccines are based on raising a neutralizing antibody (nAb) response to the pathogen
  - No simple host genetic basis (epitopes) of the specificity of neutralizing antibody responses is known
  - Need to measure these responses