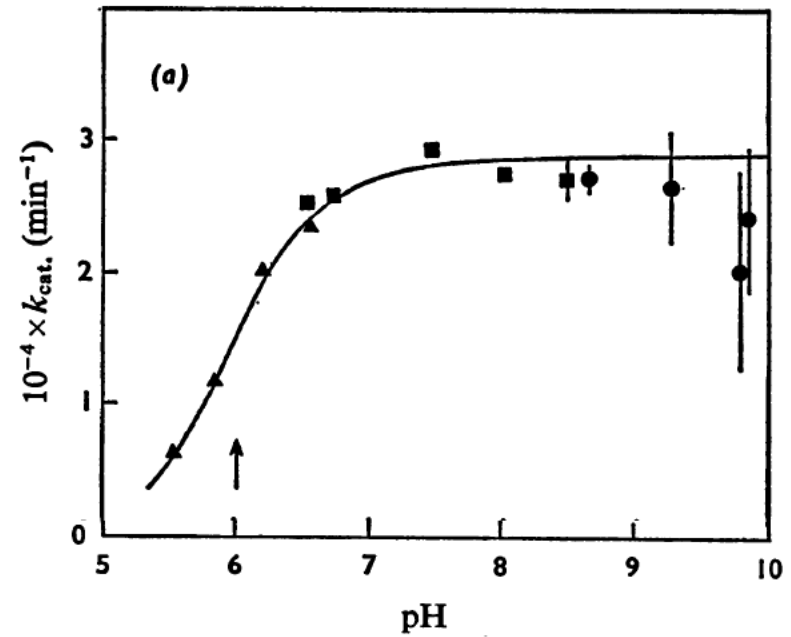
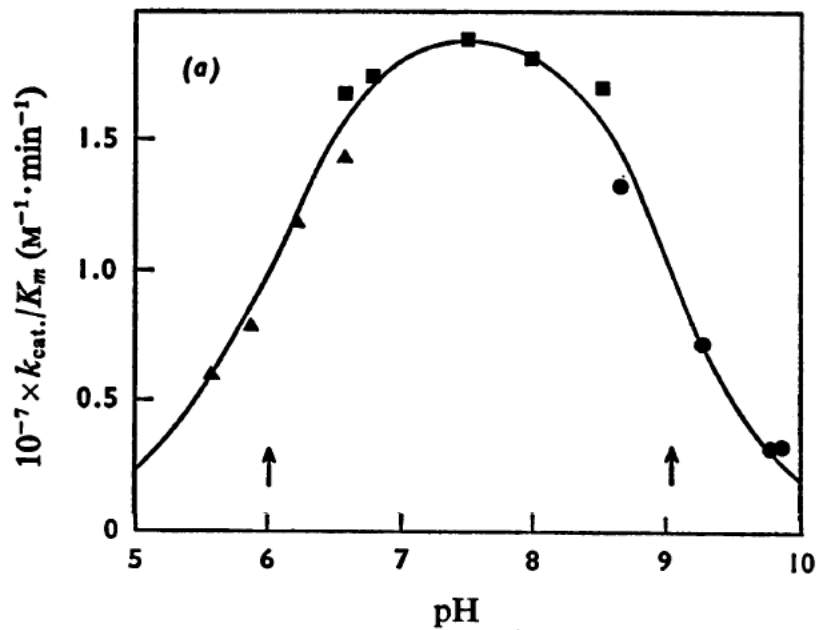
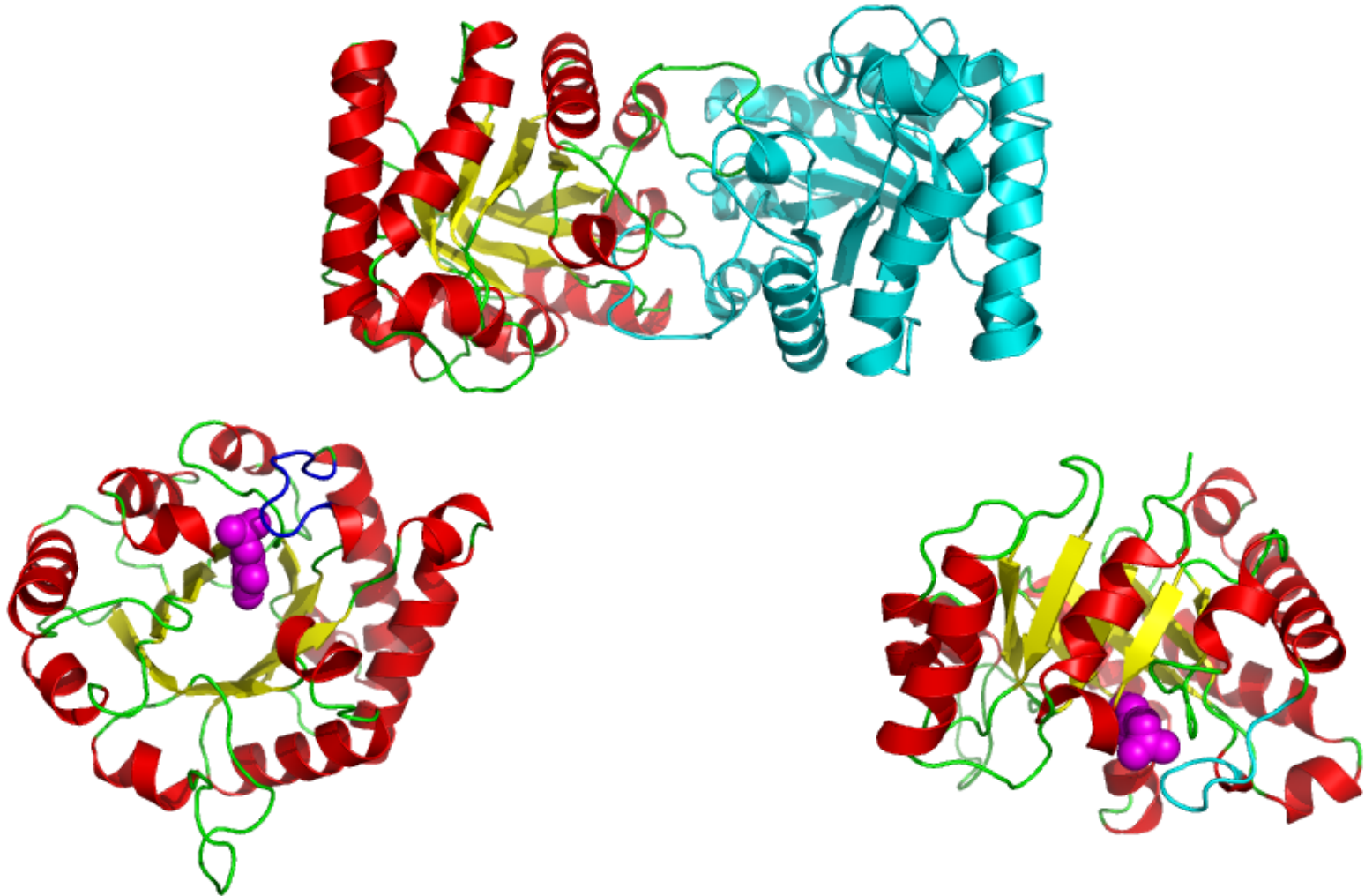


pH Profiles for TIM

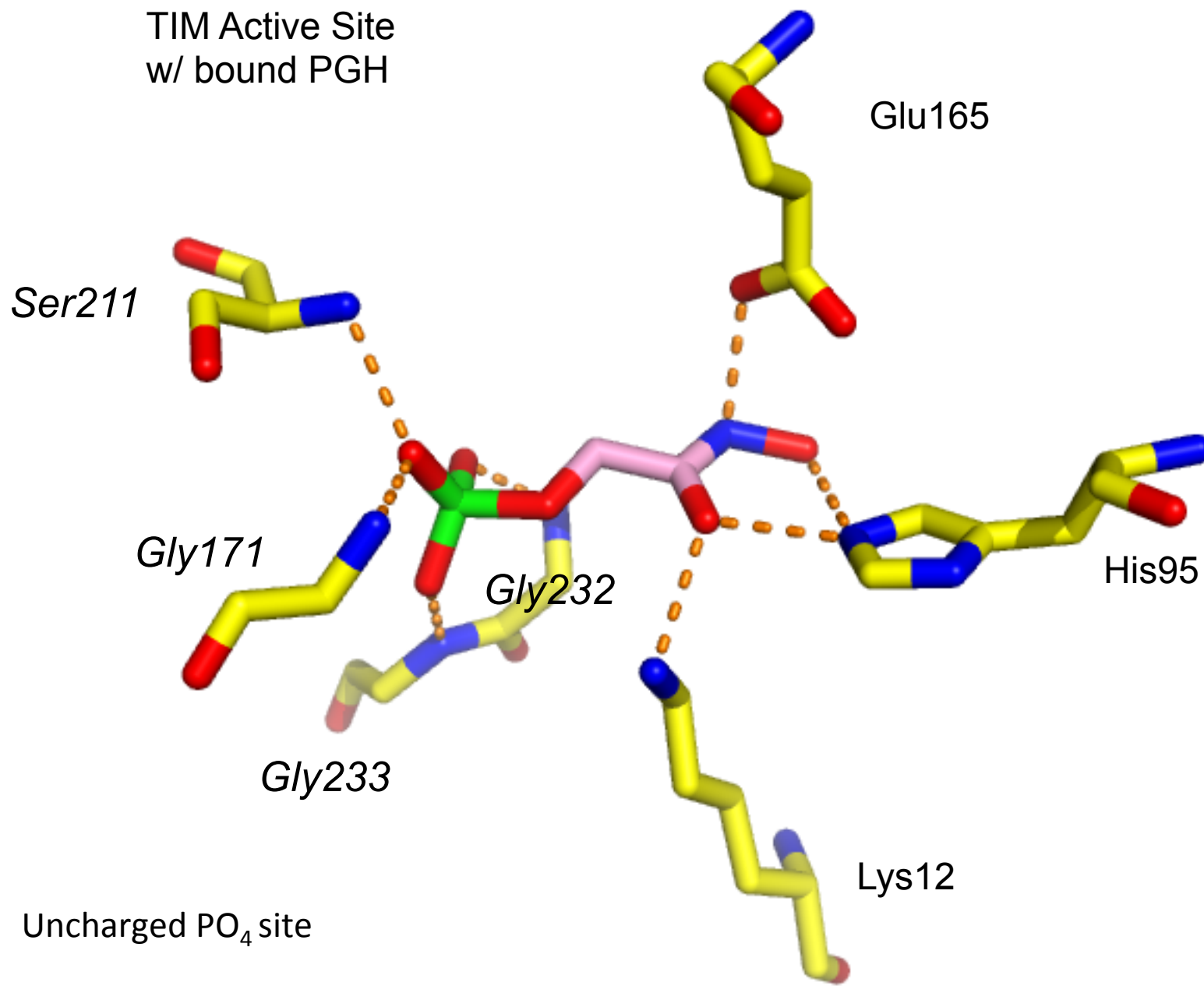


***Biochem. J.* (1972) 129, 311–320**

Triose Phosphate Isomerase

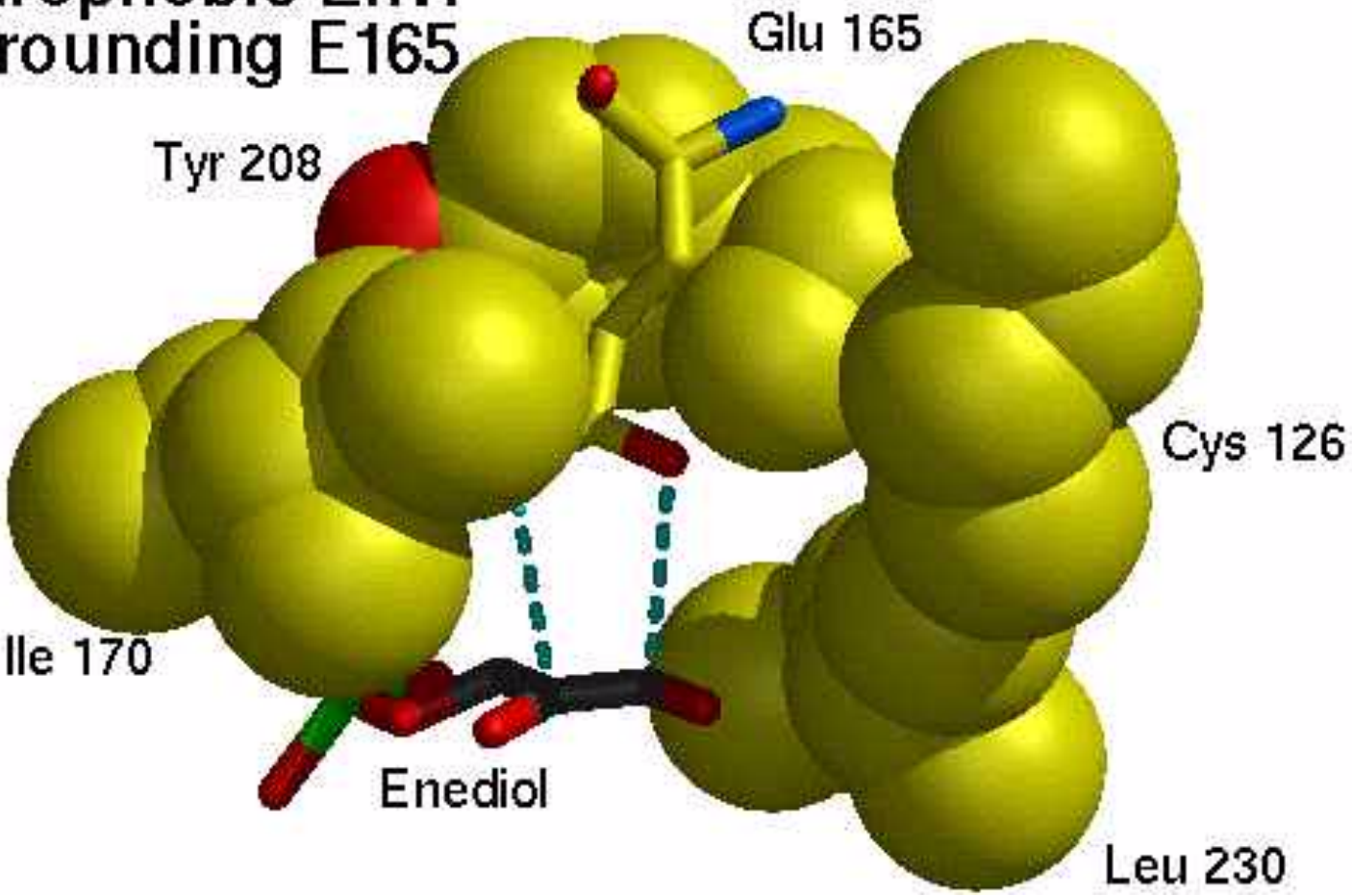


TIM Active Site
w/ bound PGH

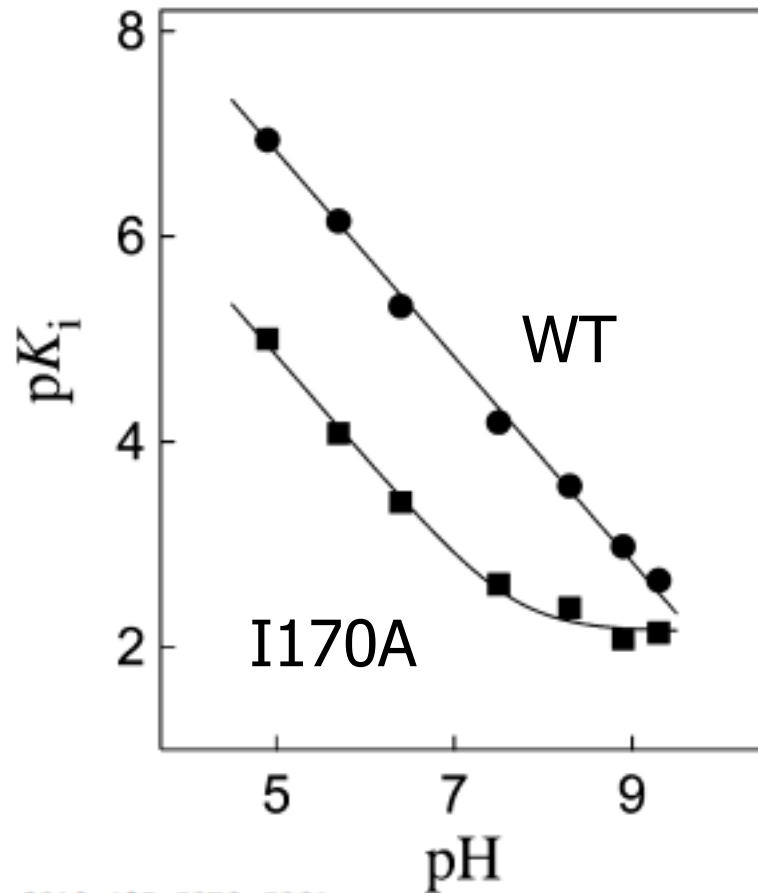
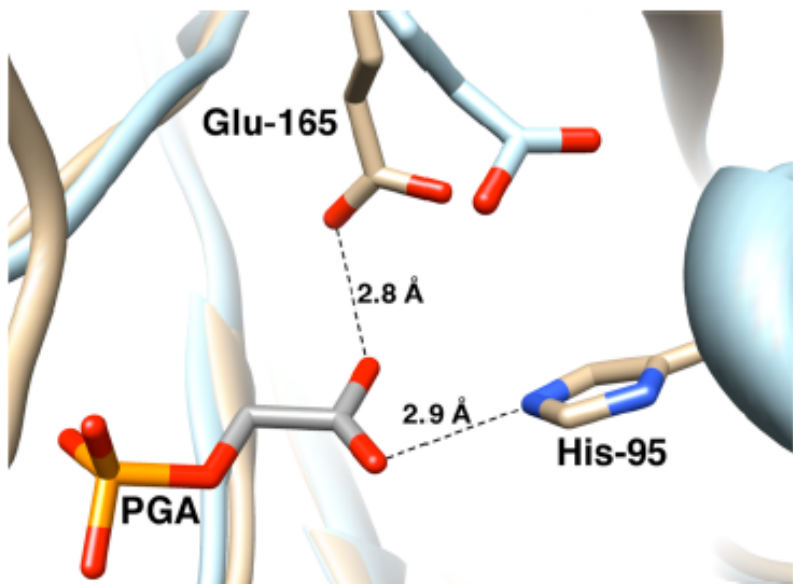


Uncharged PO_4 site

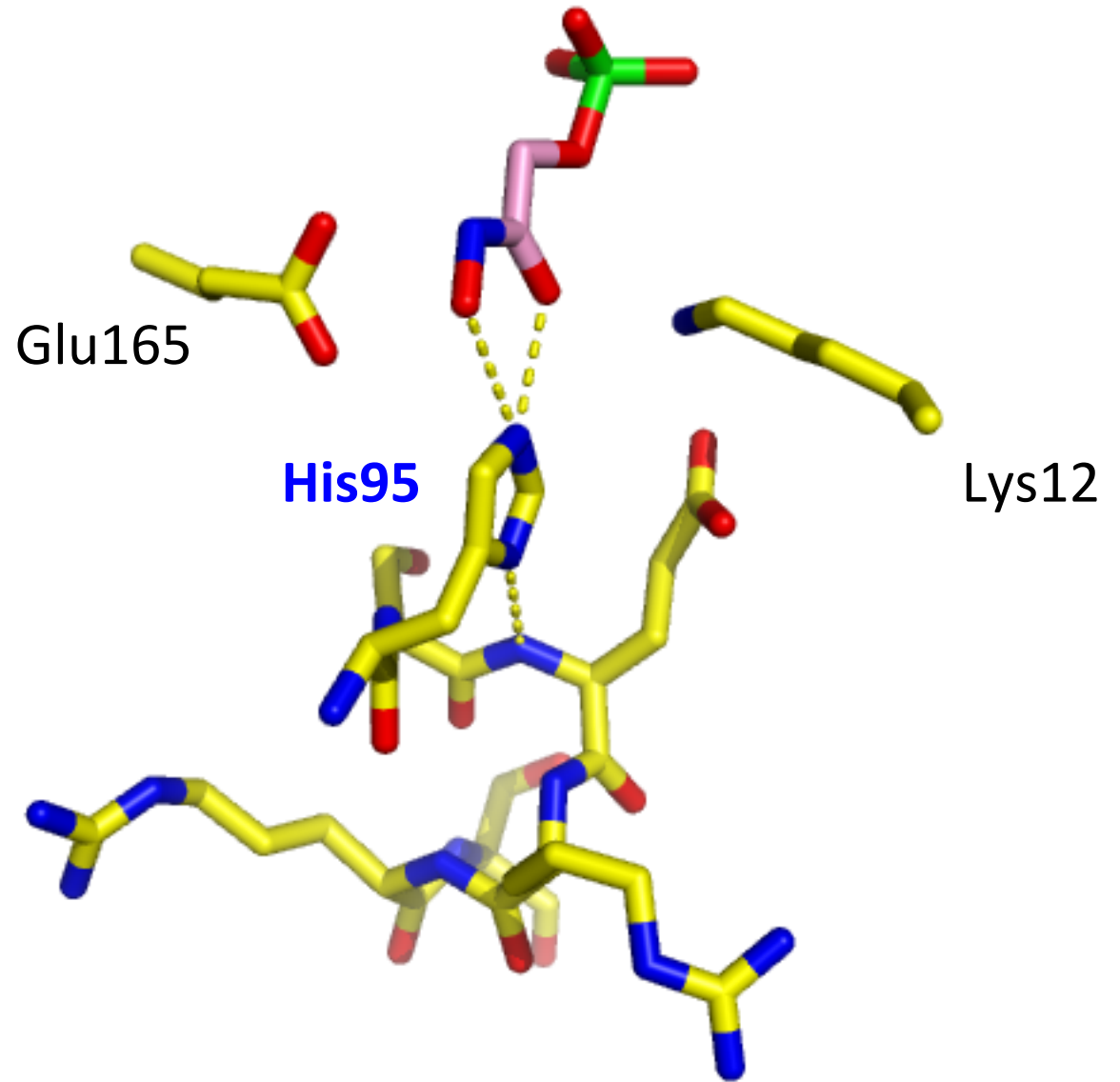
**Hydrophobic Env.
Surrounding E165**



Glu165 Has a High pK_a



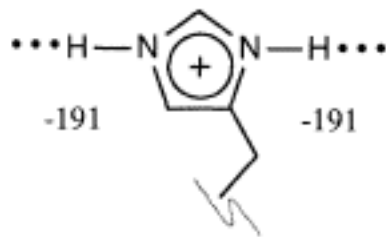
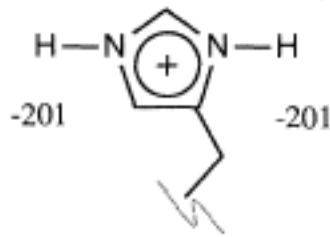
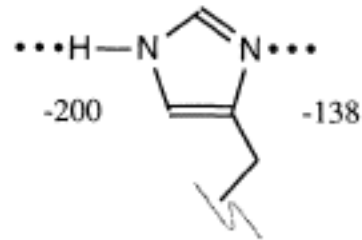
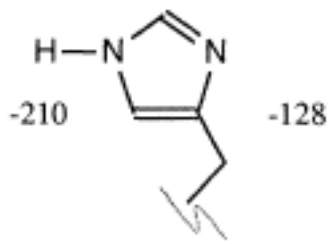
His95 is
H-bonded
to amide N



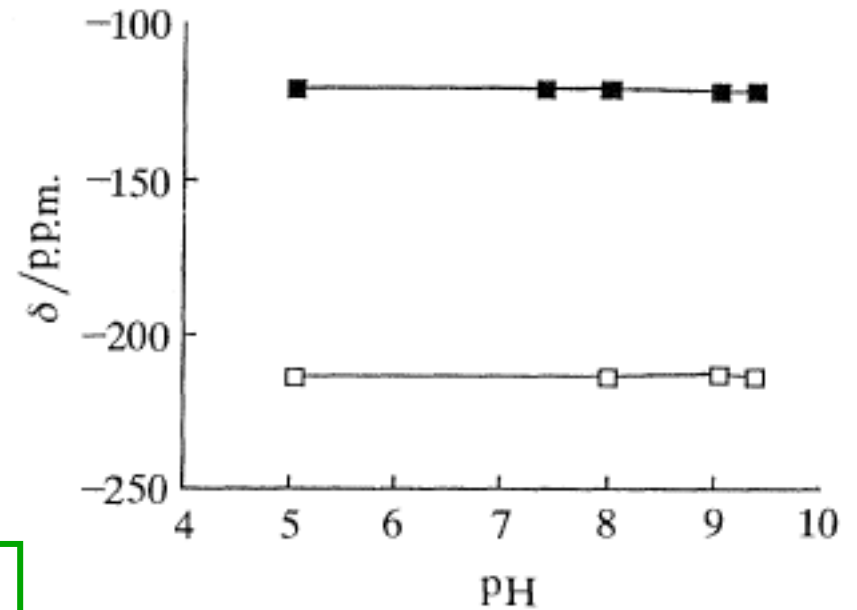
His95 is Neutral

¹⁵N Chemical Shift for His in Different Environments

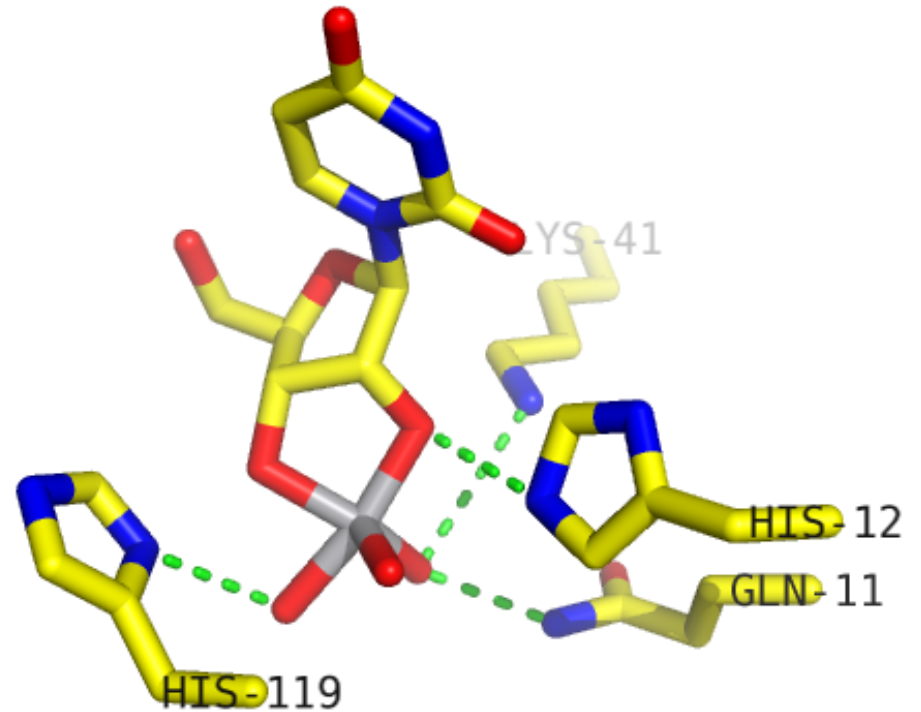
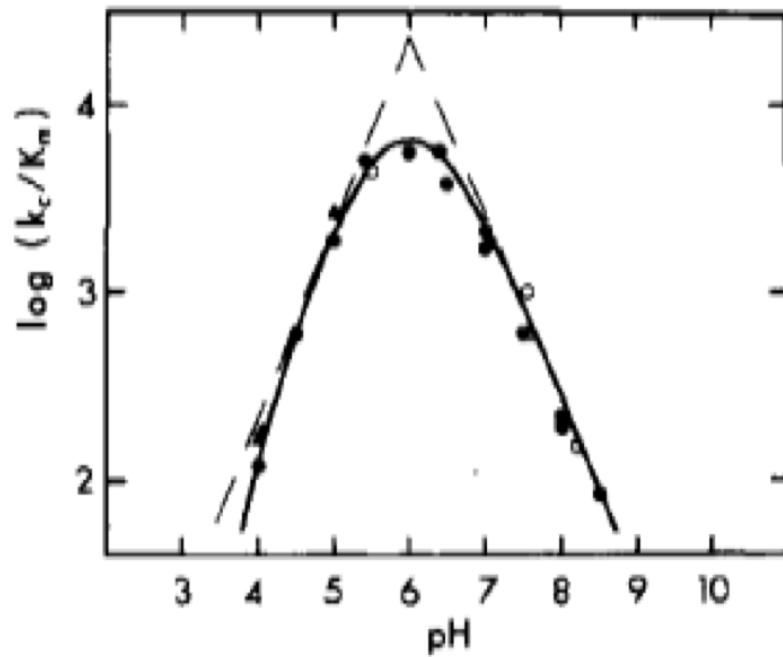
Shifts do not change with pH
In TIM active site.



-214	un-liganded	-122	-204	plus PGH	-123
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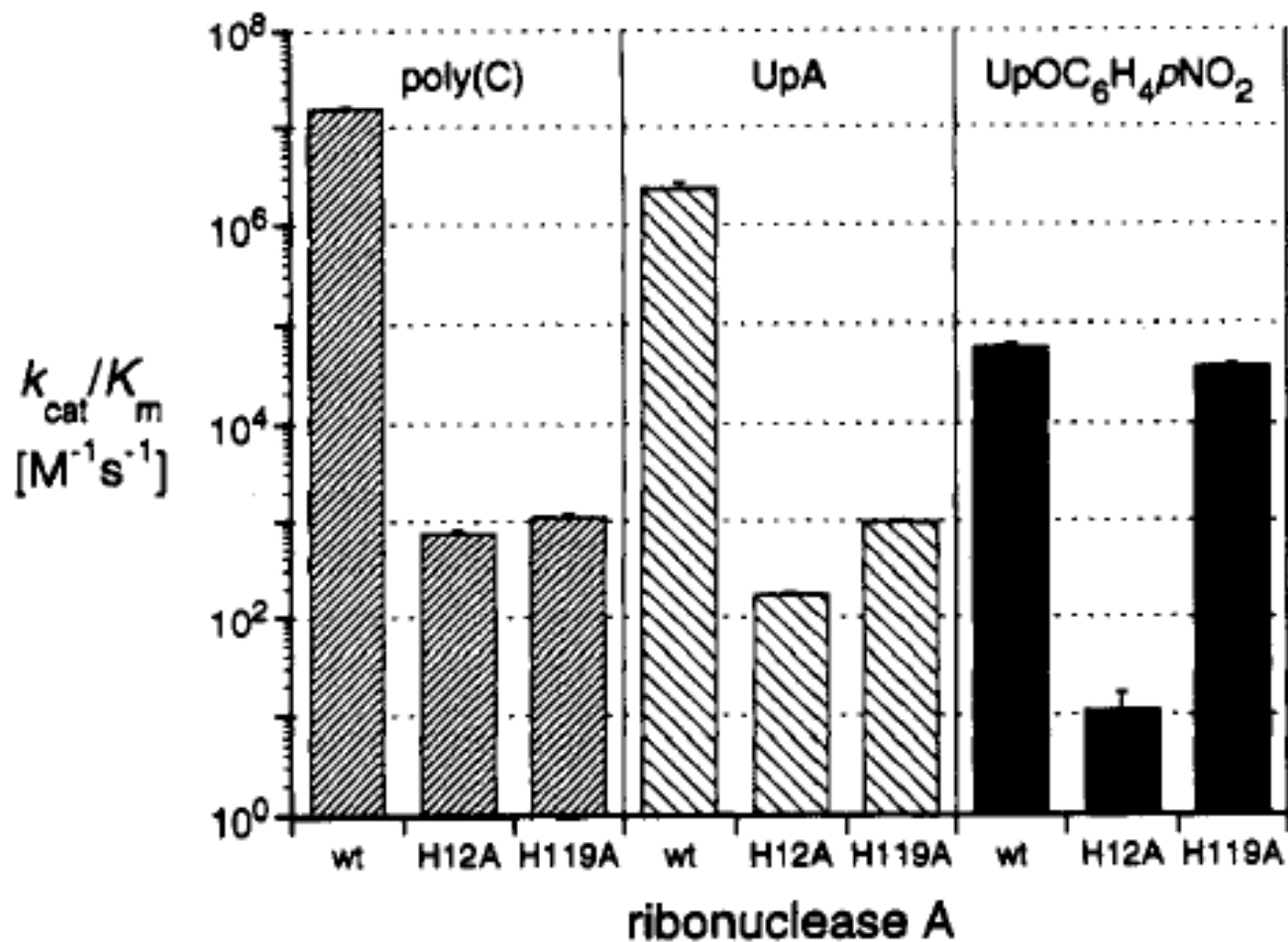


Active site of RNase



Biochemistry 1983, 22, 5123–5134

His12/His119 Important



J. Am. Chem. Soc. **1994**, *116*, 5467–5468

Brønsted Analysis of Rnase A

Table I: Kinetic Parameters for the Cyclization of Substituted Uridine 3'-(Phenyl Phosphate)s by Bovine Pancreatic Ribonuclease A^a

substituent ^b	pK _a ^{ArOH}	k_{cat}/K_m^c (M ⁻¹ s ⁻¹)	N ^d	10 ⁶ [E] ^e (M)	λ ^f (nm)
parent	9.95	2400	4	0.4-3	230
4-Cl	9.38	3900	3	1-3	230
2-Cl	8.48	20000	4	0.5-3	241
3-NO ₂	8.35	7400	4	0.5-3	235
3,5-Cl ₂	8.18	5600	4	0.5-3	241
2,5-Cl ₂	7.51	41000	4	0.5-3	240
4-NO ₂	7.14	9600 ^g	4	0.5-3	400
2,4,5-Cl ₃	6.72	46000	4	0.5-3	240
2-Cl, 4-NO ₂	5.45	70000	6	0.5-3	400

