

# Supporting Informations

## **Computational and experimental studies of the breathing motion of a protein loop: implications in *Pf*AMA1-*Pf*RON2 late-stage binding event**

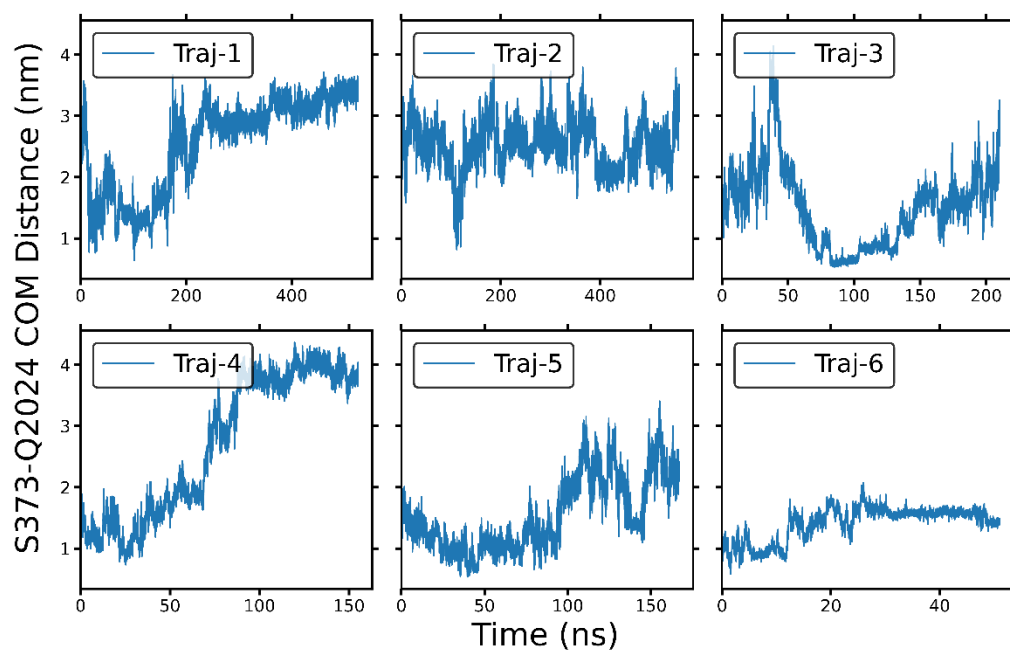
**Suman Sinha,<sup>†</sup> Anamika Biswas,<sup>†</sup> Jagannath Mondal\*, and Kalyaneswar Mandal\***

*From the Tata Institute of Fundamental Research Hyderabad, 36/p Gopanpally, Hyderabad, Telangana-500046, India*

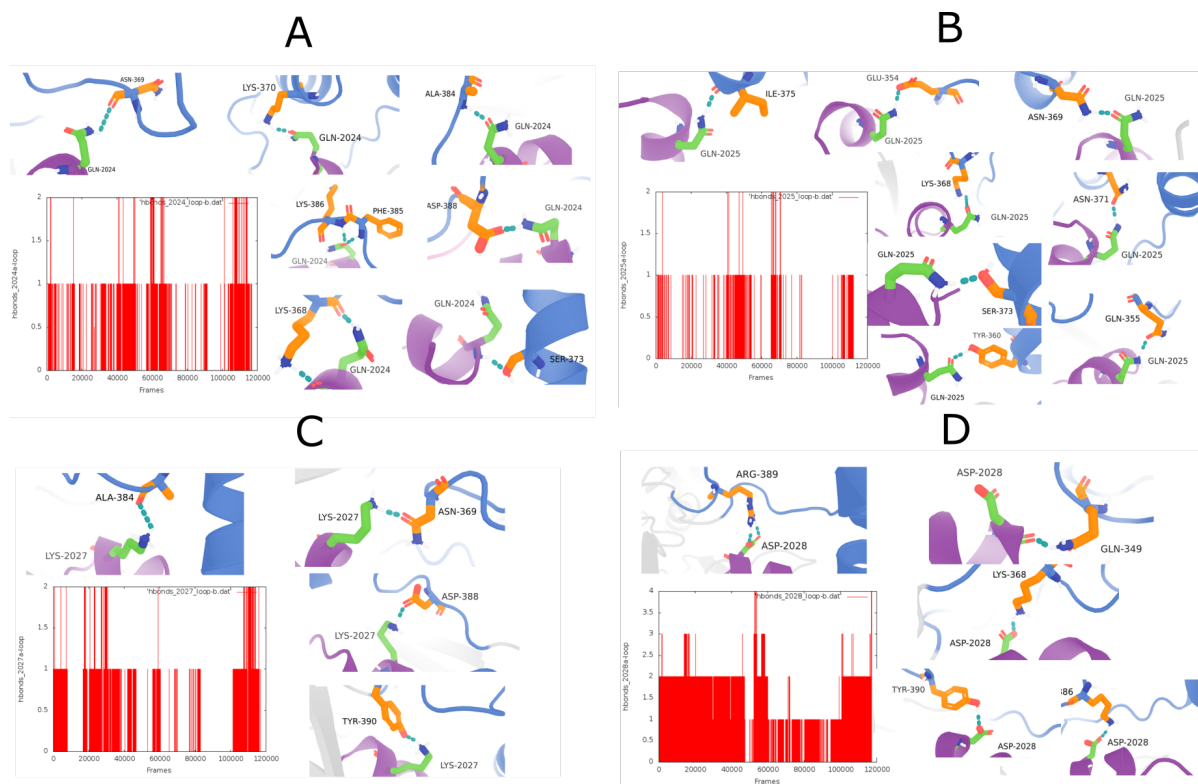
<sup>†</sup> Equal contribution

\* For correspondence: [jmondal@tifrh.res.in](mailto:jmondal@tifrh.res.in), [kmandal@tifrh.res.in](mailto:kmandal@tifrh.res.in)

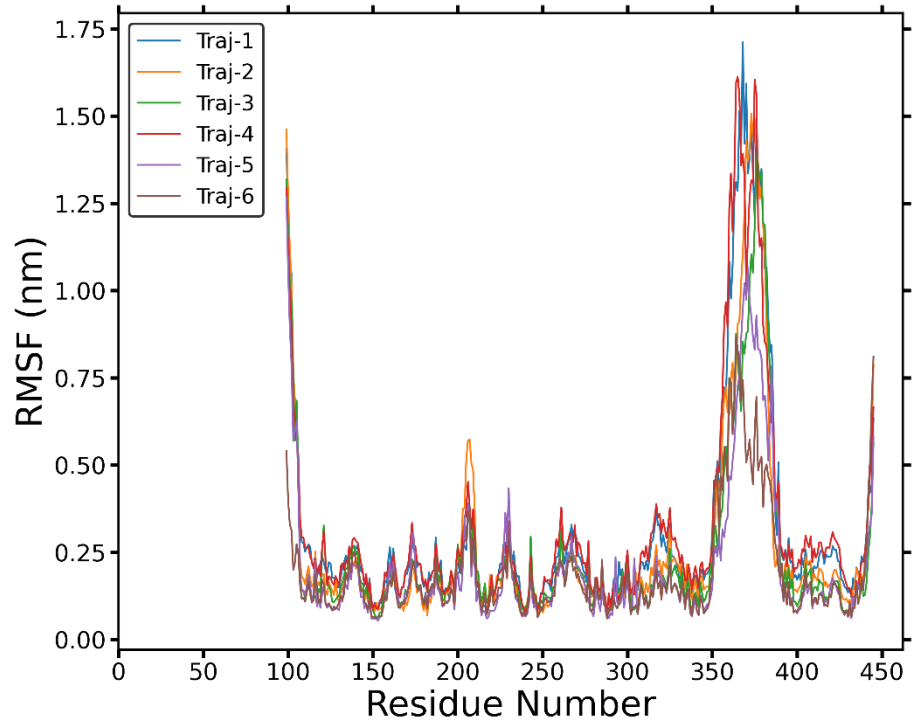
---



**Figure S1:** Distance profiles between Ser373 and Gln2024 in all trajectories



**Figure S2.** Detailed hydrogen bond interactions between Gln2024 (A), Gln2025 (B), Lys2027 (C), Asp2028 (D) with representative residues of DII loop.



**Figure S3:** Superposition of the RMSF plot from all trajectories

**Table S1.** Trend in change of affinity upon alanine substitution experiments.

Ligands	Fold increase in $K_D$ (SPR)	Fold increase in $K_D$ (ITC)
<i>Pf</i> RON2 <sub>2021-2059</sub>	NA	NA
K2027A	41.07	2.84
D2028A	10.40	2.78
Q2024A	6.44	1.98
Q2025A	3.42	1.75

**Table S2.** Summary of results obtained from multiple repeats of SPR experiments.

Ligand	Repetitions	$K_a$ ( $M^{-1} \cdot Sec^{-1}$ )	$K_d$ ( $Sec^{-1}$ )	$K_D$ (nM)
Q2024A	Set-1	74509.7	9.61E-03	129
	Set-2	61882	9.26E-03	150
	Set-3	60024.9	9.68E-03	161
	Set-4	71030.5	8.82E-03	124
Q2025A	Set-1	1.43E+05	0.01056	74
	Set-2	1.58E+05	0.01065	67
	Set-3	1.87E+05	0.01501	80
	Set-4	1.06E+05	8.22E-03	77
K2027A	Set-1	10318.3	9.50E-03	920
	Set-2	22201.6	0.01951	879
	Set-3	4.00E+04	0.03582	896
D2028A	Set-1	49394.9	0.01535	311
	Set-2	6.93E+04	0.01515	219
	Set-3	7.77E+04	0.01193	154

**Table S3.** Summary of results obtained from two repeats of ITC experiments.

Ligand	Set-1					Set -2				
	K <sub>D</sub> (nM)	Molar ratio	$\Delta H$ (kcal/mol)	$-T\Delta S$ (kcal/mol)	$\Delta G$ (kcal/mol)	K <sub>D</sub> (nM)	Molar ratio	$\Delta H$ (kcal/mol)	$-T\Delta S$ (kcal/mol)	$\Delta G$ (kcal/mol)
Q2024A	271.7	1.28 ± 0.02	-4.51	-4.45	-8.96	184.2	1.69 ± 0.04	-3.33	-5.88	-9.20
Q2025A	227.8	1.01 ± 0.02	-5.23	-3.85	-9.08	175.4	0.99 ± 0.03	-5.61	-3.61	-9.22
K2027A	378.8	0.55 ± 0.04	-6.58	-2.18	-8.76	274.7	0.70 ± 0.01	-6.00	-2.96	-8.95
D2028A	375.9	1.05 ± 0.03	-6.85	-1.91	-8.76	265.3	0.85 ± 0.02	-9.25	0.27	-8.97