Supplementary Information (SI) for Physical Chemistry Chemical Physics.

Effect of Site-Specific Lysine Acetylation on Tau Binding to Microtubules: Mechanistic Insights from All-Atom Molecular Dynamics Simulation

Pengxuan Xia[a], Dushuo Feng[a], Bote Qi[a, b], Lulu Guan[a], Yunxiang Sun[c] and Yu Zou[a]*

[a] Department of Sport and Exercise Science, College of Education, Zhejiang University, Hangzhou, Zhejiang 310058, P. R. China

[b] School of Management, Zhejiang University Hangzhou, Zhejiang 310058, P. R. China

[c] Department of Physics, Ningbo University, Ningbo, Zhejiang 315211, P. R. China

Corresponding author: *

E-mail: zouyuzy@zju.edu.cn (Yu Zou)

Table S1. Setup details of All MD Simulations.

Systems	Simulation time (ns)	Number of trajectories	Box sizes (nm^3)	Number of atoms
R2_wt	300	3	9.86*9.86*15.85	153728
R2_aK274	300	3	9.86*9.86*15.85	153733
R2_aK280	300	3	9.86*9.86*15.85	153736
R2_aK281	300	3	9.86*9.86*15.85	153742

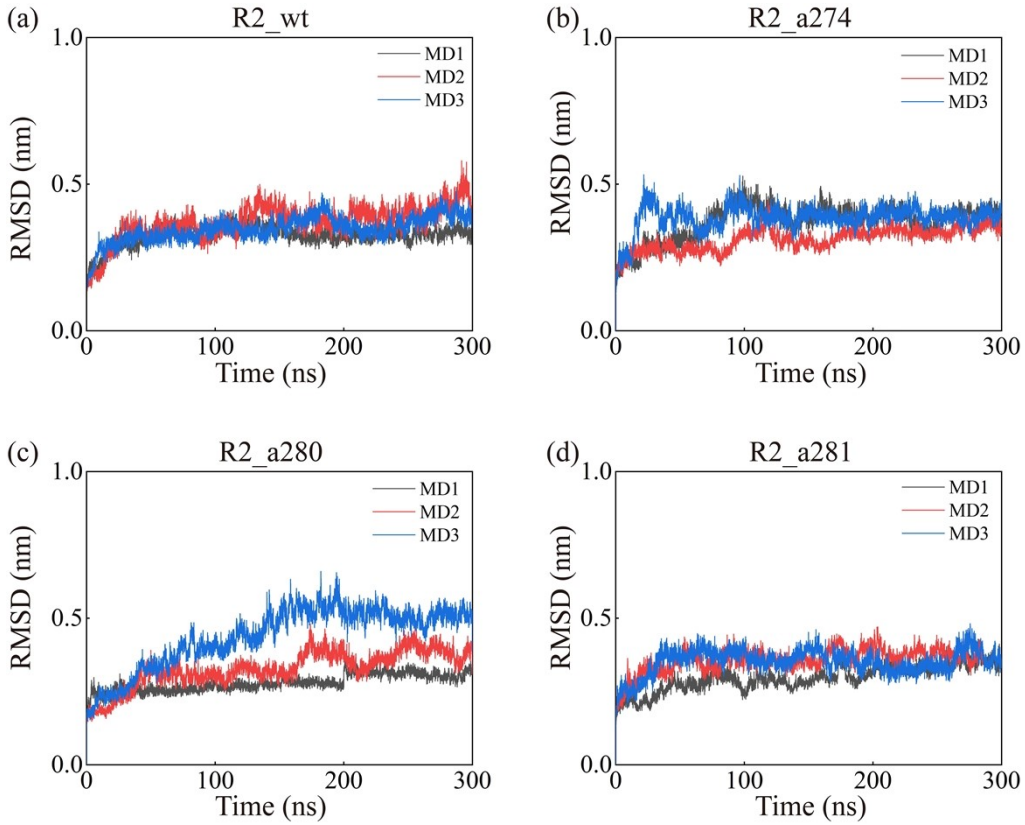

Figure S1. Time evolution of all-atom RMSD of the four systems (R2_wt, R2_aK274, R2_aK280, and R2_aK281), respectively.

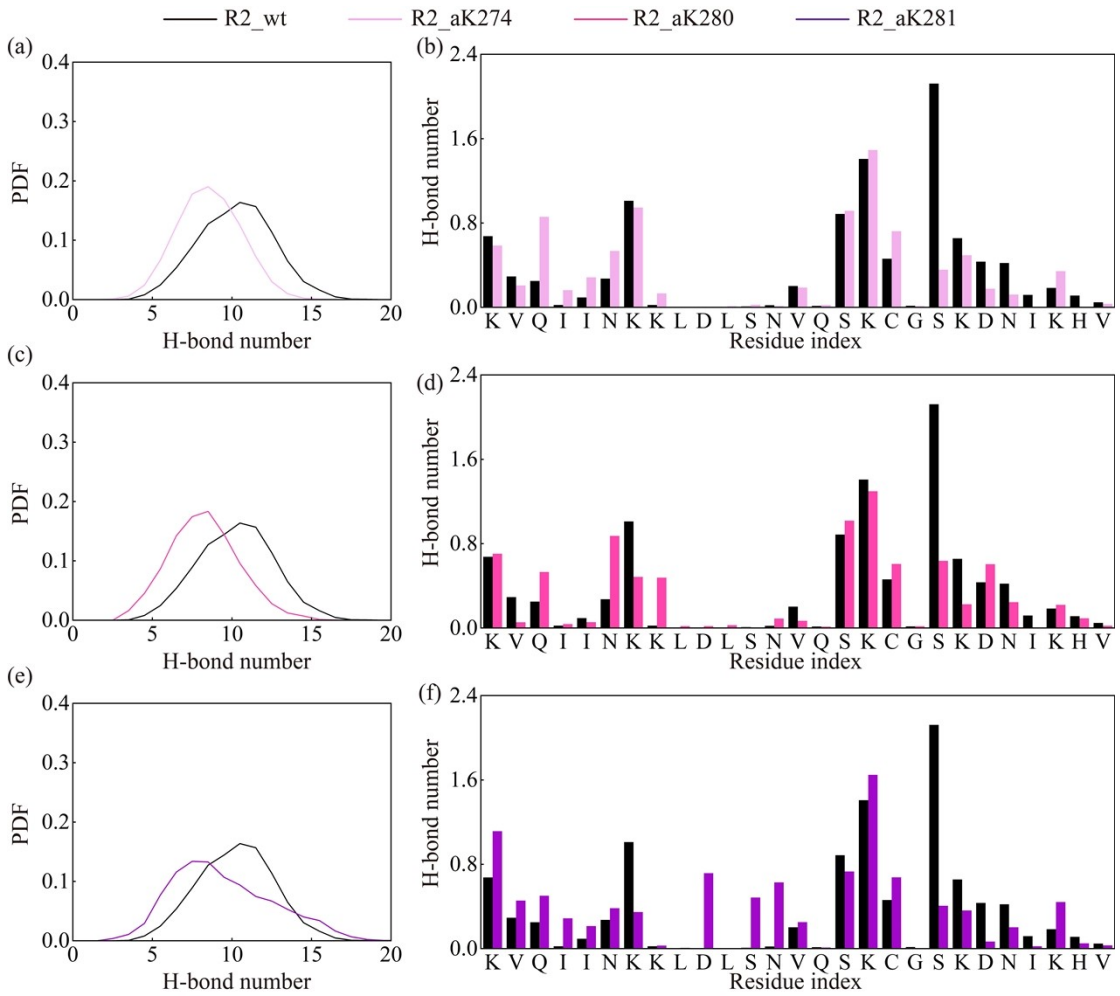

Figure S2. Analysis of hydrogen bonding interactions between Tau_R2 and microtubules. (a, c, e) Probability distribution functions of the number of hydrogen bonds formed between Tau_R2 and microtubules in four simulation systems (R2_wt, R2_aK274, R2_aK280, and R2_aK281). (b, d, f) Residue-level hydrogen bond counts between Tau_R2 and microtubules for each of the four systems.

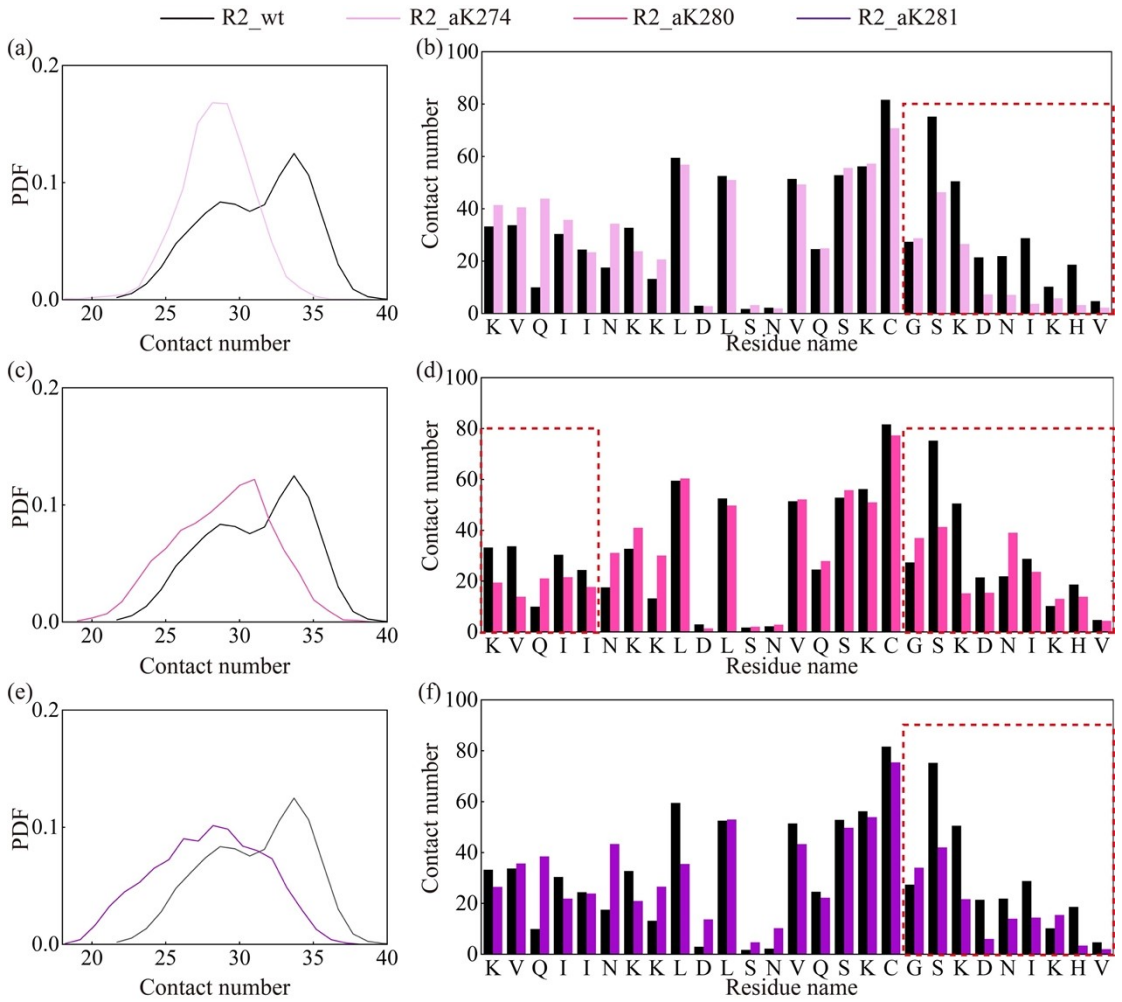

Figure S3. Analysis of the contact between Tau_R2 and MT. (a, c, e) PDFs of contact number between Tau_R2 and MT in the R2_aK274, R2_aK280, and R2_aK281 systems, compared to R2_wt. (b, d, f) Contact numbers between individual residues of Tau_R2 and MT in the corresponding systems.

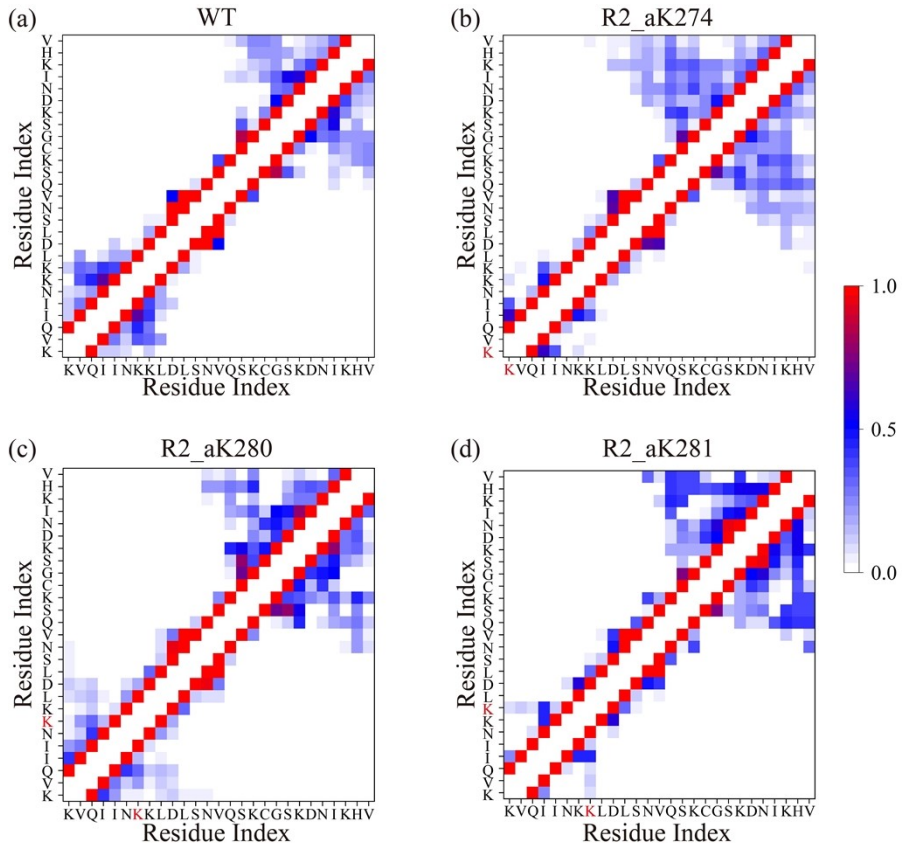

Figure S4. Residue-residue interaction analyses. (a-d) The intrachain residue-residue contact probabilities for each simulation of the four systems, respectively