

Supplementary Materials for

# Functionalized Fullerene Potentially Inhibits SARS-CoV-2 Infection by Modulating Spike Protein Conformational Changes

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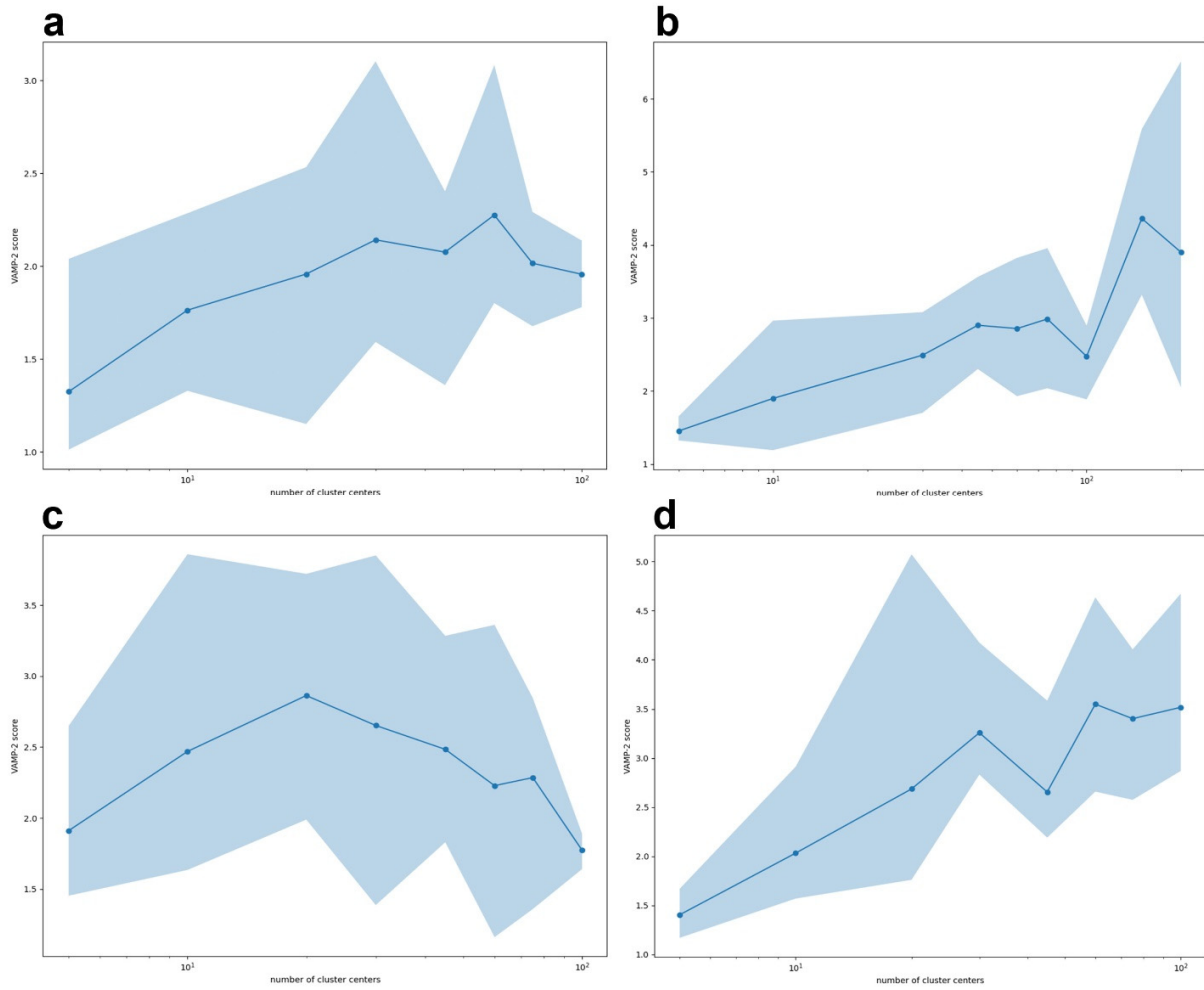
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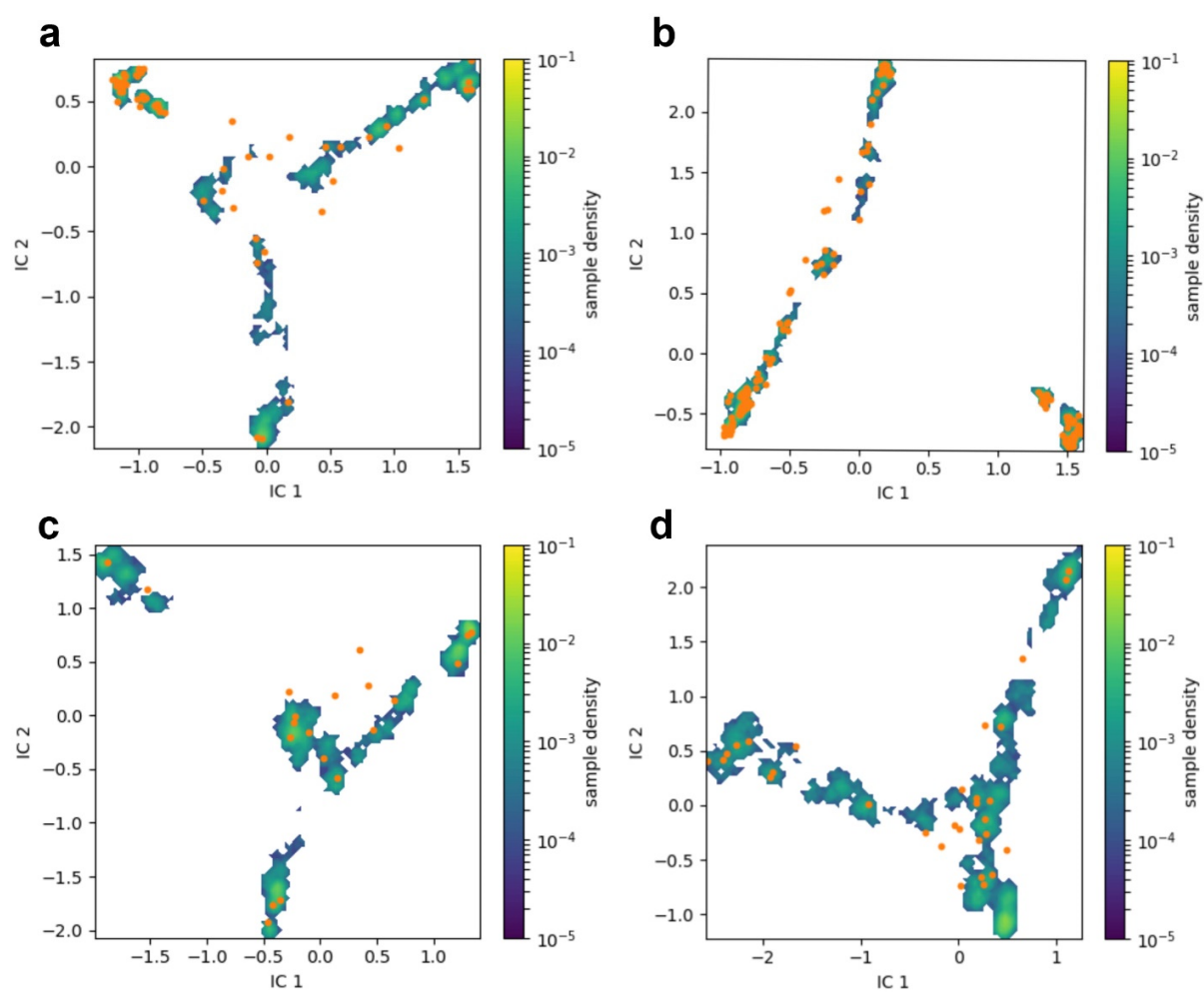
Figures S1 to S4

**Figure S1**



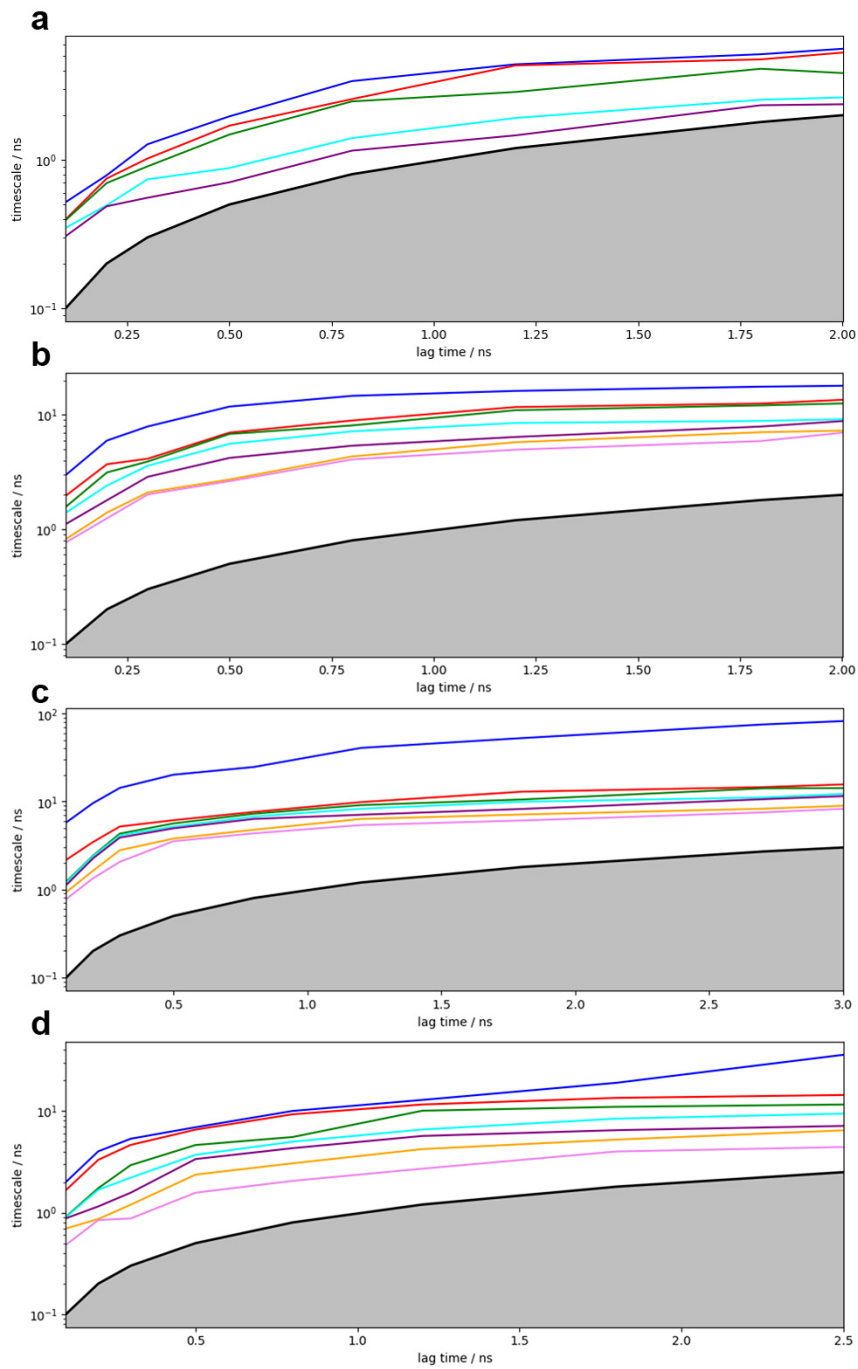
**Figure S1.** VAMP2 scores for different number of clusters centers. **a** The highest VAMP2 score for the WT system corresponds to  $k=60$ . **b** The highest VAMP2 score for the WTF system corresponds to  $k=150$ . **c** The highest VAMP2 score for the XBB system corresponds to  $k=20$ . **d** The highest VAMP2 score for the XBBF system corresponds to  $k=30$ .

**Figure S2**



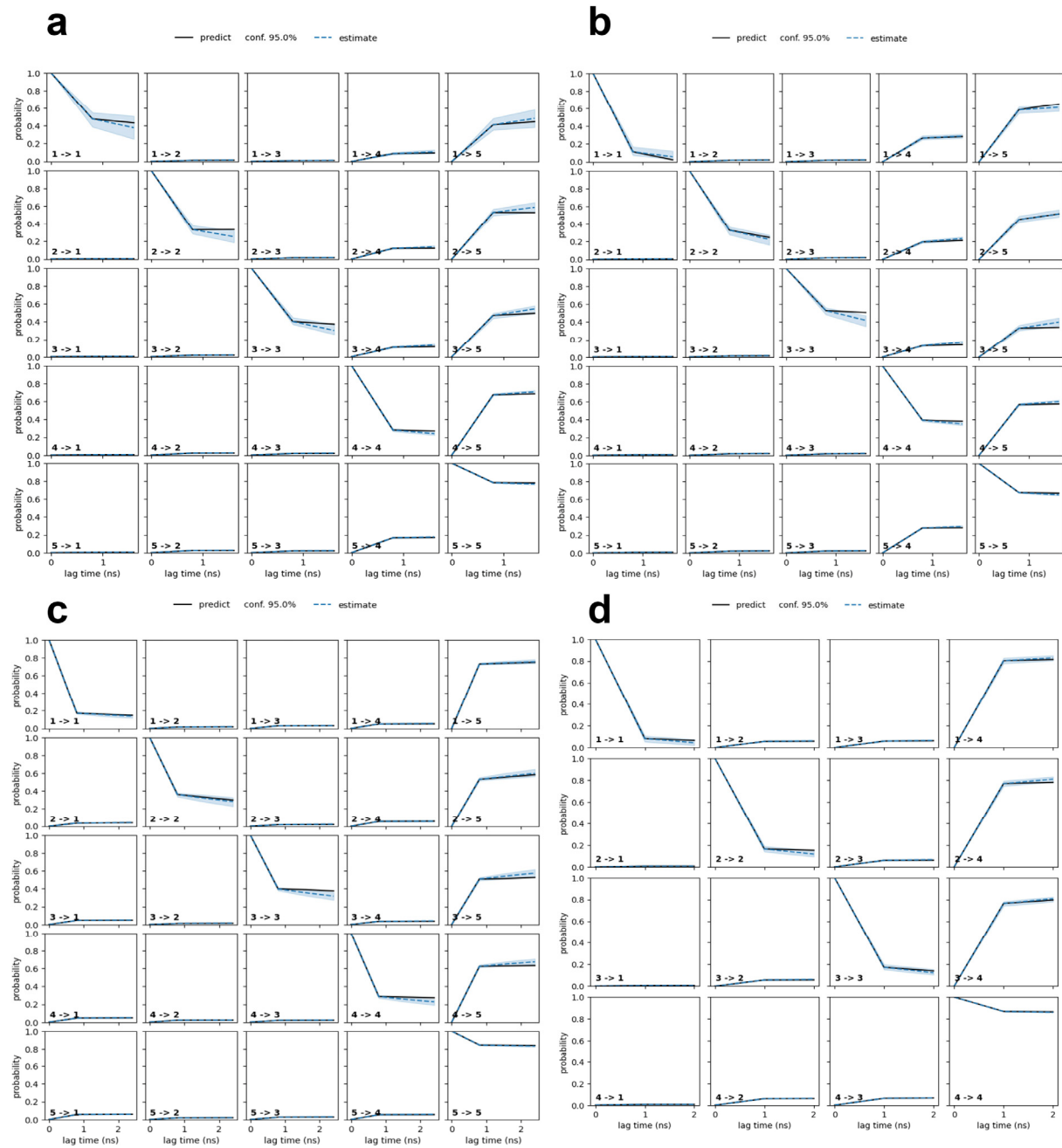
**Figure S2.** K-means clustering results of TICA-reduced trajectories data. **a** Clustering result of WT. **b** Clustering result of WTF. **c** Clustering result of XBB. **d** Clustering result of XBBF.

**Figure S3**



**Figure S3.** Determination of lag time, time scale reaches stability after 0.8 ns. **a** Lag time of WT. **b** Lag time of WTF. **c** Lag time of XBB. **d** Lag time of XBBF.

**Figure S4**



**Figure S4.** Results of Chapman-Kolmogorov tests for dividing systems into metastable states, a nearly agreement were observed for all the lag time, indicating the high Markovianity of the microstates, these metastable states are reasonable choices for our MSM. **a** WT. **b** WTF. **c** XBB. **d** XBBF.