

## **Description of Additional Supplementary Files**

File name: Supplementary Movie 1

Description: Molecular dynamics simulation of ATP1 state. ATP1 shifts from its original location.

File name: Supplementary Movie 2

Description: Molecular dynamics simulation of ATP2 state. ATP2 shows a relatively stable conformation in 50 ns of the simulation.

File name: Supplementary Movie 3

Description: Molecular morph of AC9 in different states. AC9-C4 (magenta, partial activated state), AC9-G $\alpha$ s (orange, occluded state), AC9<sub>1250</sub>-G $\alpha$ s-M (pink, partial activated state) and AC9<sub>1250</sub>-G $\alpha$ s-MF (blue, fully activated state) are aligned to AC9- M (white, basal state) based on C2a domain. The whole-domain rearrangements correspond to increased levels of AC9 activation.