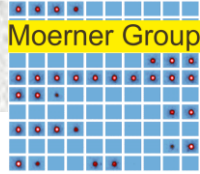


Sensing cooperativity in ATP hydrolysis for single multisubunit enzymes in solution

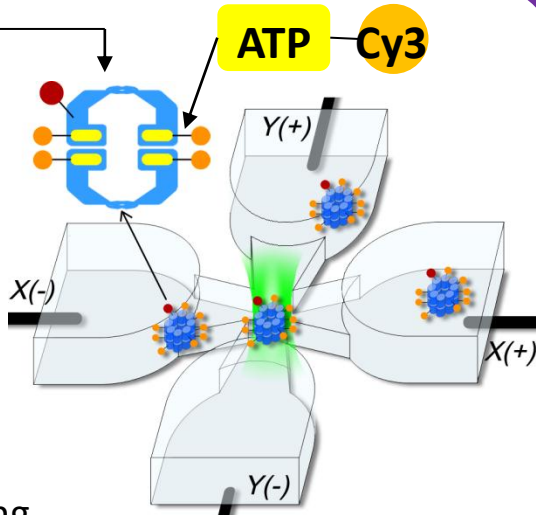


Yan Jiang, *et al. PNAS* **108**, 16962 (2011)

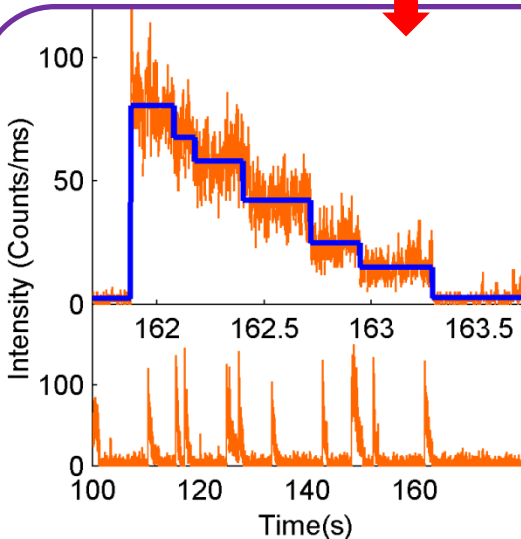
TRiC:

16-subunit mammalian chaperonin

Binding, hydrolysis and release of ATP induce the critical cavity opening/closing which assists in protein folding of actin, ...

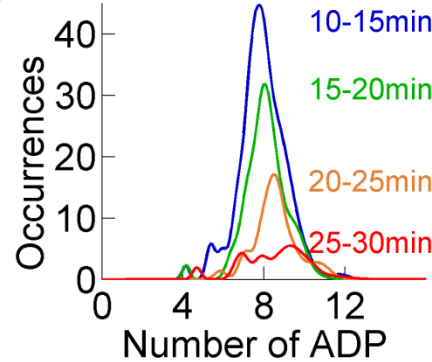


ATP **Cy3**

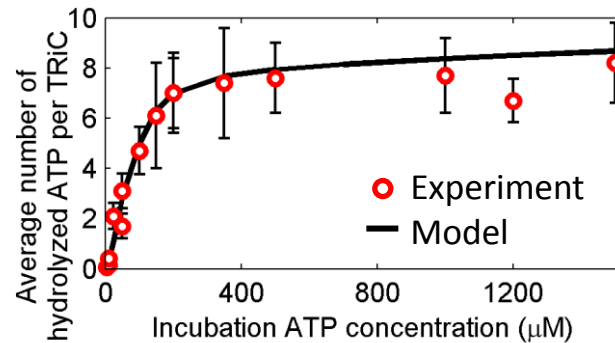


Stepwise fluorescence emission in ABEL trap reflects the photobleaching of individual dyes. Count the number of Cy3-ADP on each trapped chaperonin to build a distribution.

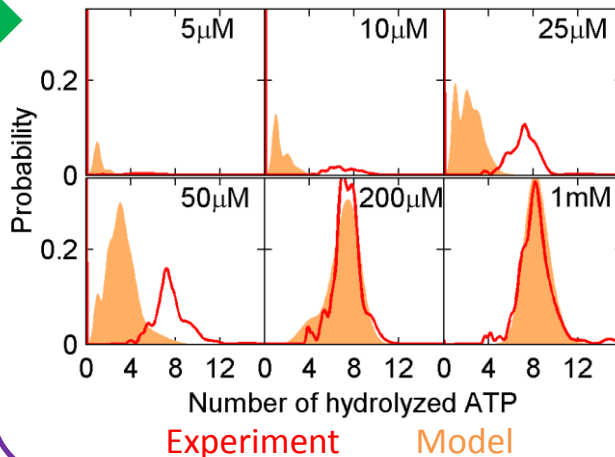
of Cy3-ADP on each trapped chaperonin to build a distribution.



Time- dependent ADP number distribution: The height of the peak shrinks while the position stays at eight, indicating a highly cooperative ADP release process



Number of ATP hydrolyzed by each chaperonin at various [ATP]: Although the ensemble-averaged data can be matched with standard cooperative binding models, the single-molecule distributions depart significantly.



Although the ensemble-averaged data can be matched with standard cooperative binding models, the single-molecule distributions depart significantly.