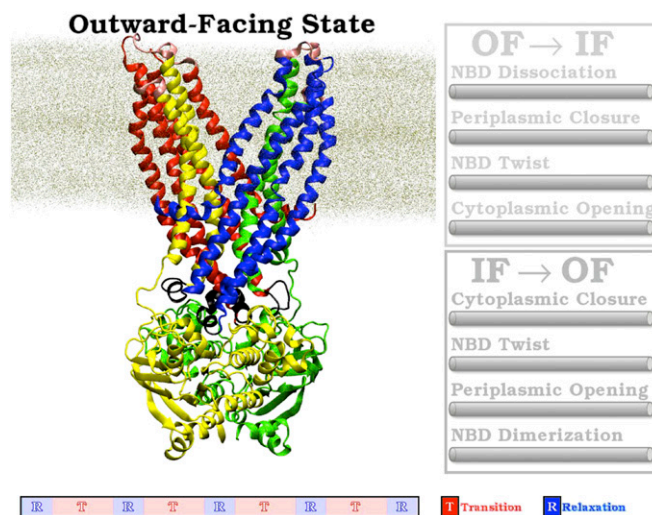


# Supporting Information

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**Movie S1.** IF ↔ OF conformational transition of *apo* MsbA. The OF → IF transition was induced using the optimized protocol ( $d_{\text{NBD}} \rightarrow \gamma \rightarrow \alpha$ ). The backward process was not simulated (although shown here by reversing the movie). The total simulation time was 220 ns including four 40-ns “transition” stages (using nonequilibrium-driven MD) and three 20-ns interstage “relaxation” simulations (using RMD). The NBD/TMD conformational changes associated with each transition stage are given.

[Movie S1](#)

## Other Supporting Information Files

[SI Appendix \(PDF\)](#)