



**Figure S5.** The coupled motion between adjacent protomers indicated by the structural comparison of Na<sub>v</sub>Rh and Na<sub>v</sub>Ab. **(A)** There would be a structural clash between VSDs and the pore domain of Na<sub>v</sub>Ab if its VSDs were to adopt the same conformation and position as in Na<sub>v</sub>Rh. Structures of Na<sub>v</sub>Rh and Na<sub>v</sub>Ab are superimposed relative to the pore domains. The pore helix bundle of one subunit from Na<sub>v</sub>Ab is shown and colored silver; the same segments of Na<sub>v</sub>Rh as in Figure S4A are shown in a side view. The inset illustrates the steric clash between Na<sub>v</sub>Rh-S4 (blue) and Na<sub>v</sub>Ab-S5 of the adjacent protomer (silver cartoon with orange side chains) when the pore domains are superimposed. **(B)** Concerted shift of the S4-5 helices and S5 segments between adjacent protomers. Note that the N-terminal tip of the S4-5 helix is shifted toward the pore by more than 6 Å (Figure 1D); yet there is little change in

the distance between the base of the S5 segment in one protomer (yellow) and the N-terminal tip of the S4-5 helix in the adjacent protomer (blue) in the two structures. Refer to *Supplementary Movies S5-6* for animations.