Supporting Information for

Differential Control of Heme Reactivity in Alpha and Beta Subunits of Hemoglobin: A Combined Raman Spectroscopic and Computational Study

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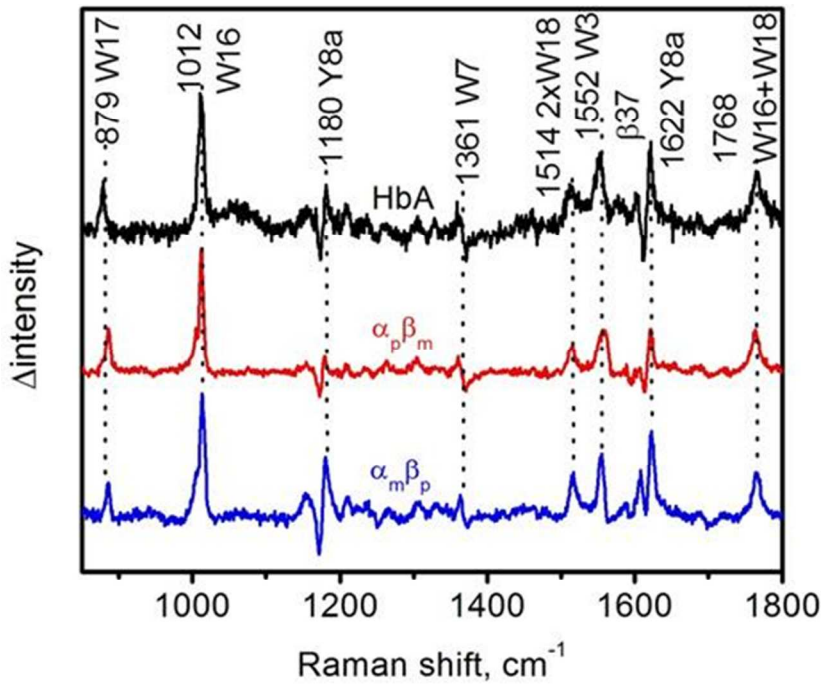

Figure S1. 229 nm-excited UVrR difference spectra between deoxyHb and HbCO (T - R) for HbA and for hybrid Hbs with mesoheme replacing protoheme in the α or β chains. Assignments are indicated for bands arising from tryptophan (W) and tyrosine (Y).[1] The difference signals are associated with inter-dimer H-bonds involving Trpβ37 and Tyrα49, which are present in the T state but not in the R state.

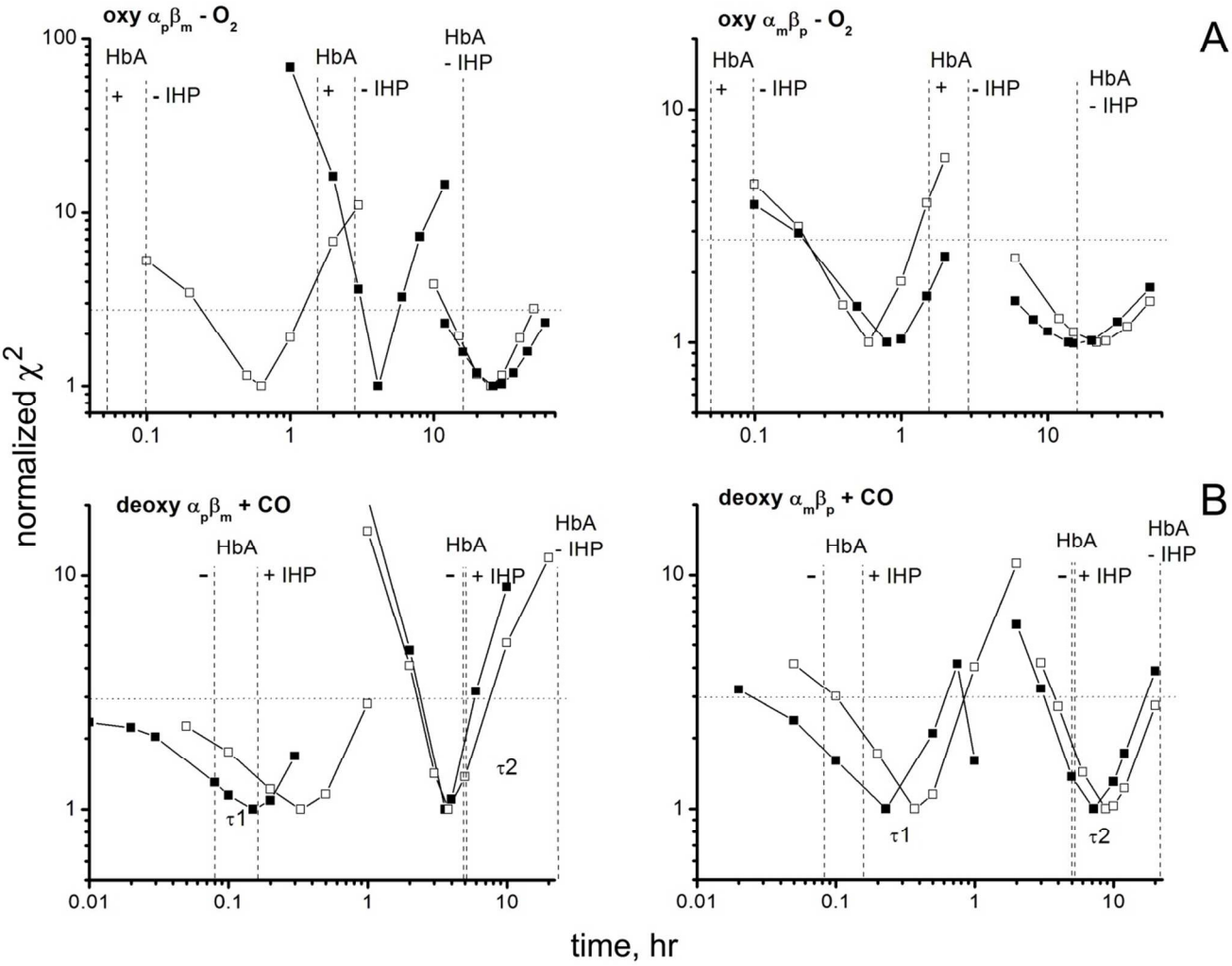

Figure S2: Error surfaces for time constants of tertiary conversion (Table 1, main text) for (A) oxyHb hybrids minus O_2 (R to T conversion), and (B) deoxyHb hybrids plus CO (T to R conversion), for $\alpha_p\beta_m$ Hb (left column) and $\alpha_m\beta_p$ Hb (right column). Points indicate normalized χ^2 values for least-squares fits of a double exponential to the data of (A) Figure 3 or (B) Figure 5 in the main text, with the indicated time constant fixed and other parameters allowed to vary. In all panels, filled symbols are samples without IHP and open symbols are samples with IHP. Vertical dotted lines are the corresponding time constants for HbA, taken from our previous study.[2] Horizontal dotted lines are the F-statistic for p = 0.05 for each dataset.

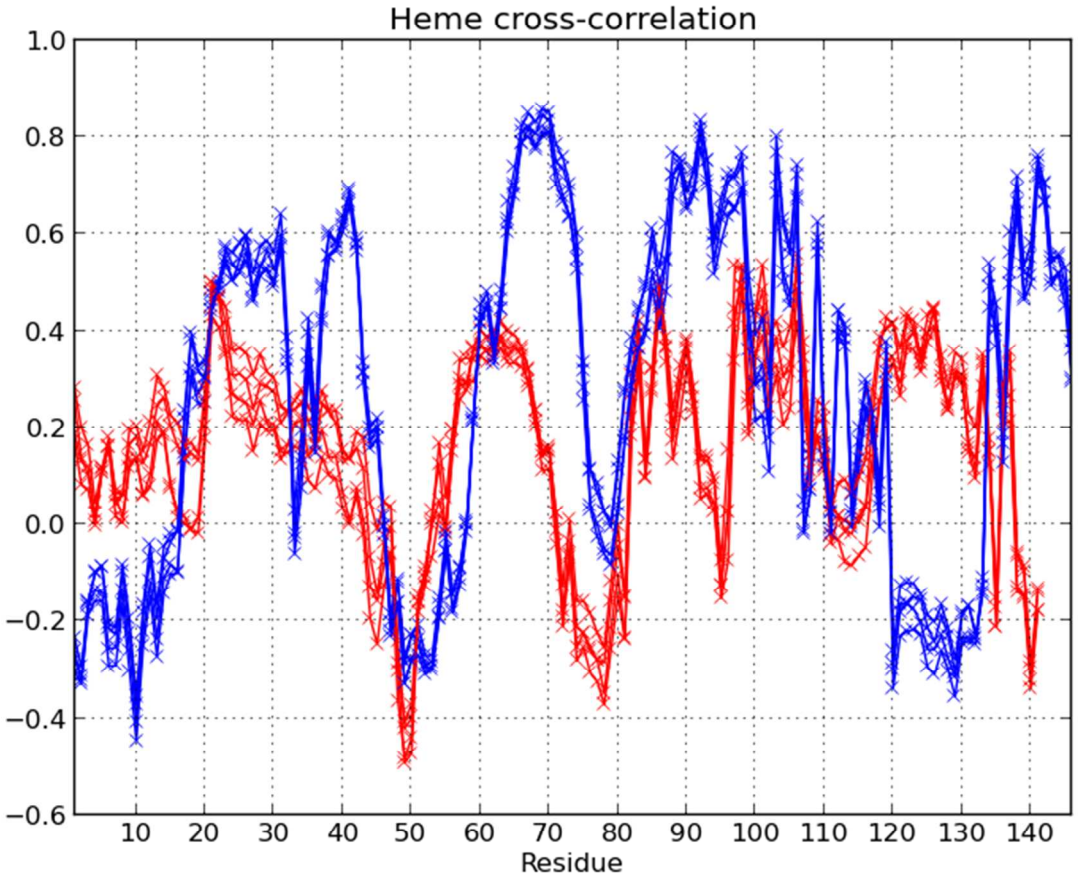

Figure S3. Cross correlation of average heme pyrrole N atom displacements along the PELE trajectory with the Cα displacements in the α (red) and β (blue) chains.

References

(1) Hu, X. H.; Spiro, T. G. *Biochemistry* **1997**, *36*, 15701.
(2) Jones, E. M.; Balakrishnan, G.; Spiro, T. G. *J Am Chem Soc* **2012**, *134*, 3461.