Protein Dynamics of Isolated Chains of Recombinant Human Hemoglobin Elucidated by Time-resolved Resonance Raman Spectroscopy

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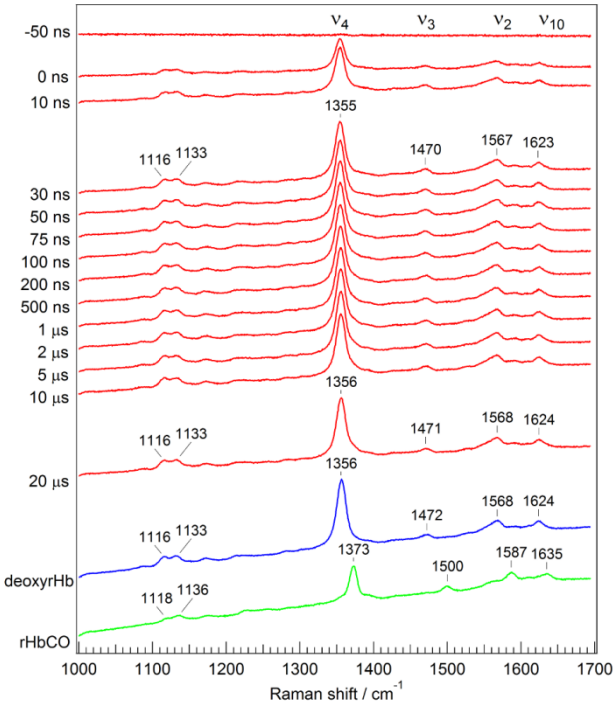

Figure S1. Time-resolved RR spectra in the 1000 to 1700 cm^{-1} region at the indicated delay time carbonmonoxy rHb following the CO photolysis. Spectra of the equilibrium states of the deoxy and CO-bound forms are depicted at the bottom for comparison. Time-resolved difference spectra were generated by subtracting the probe-only spectrum from the pump-probe spectrum at each delay time. The accumulation time for obtaining each spectrum is 18 min.

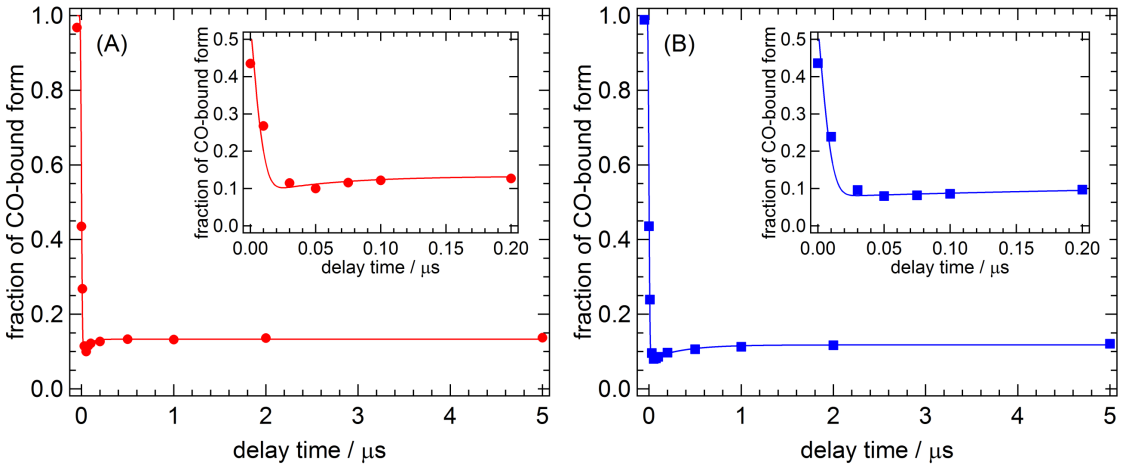

Figure S2. Fractions of the CO-bound form of the isolated α- (A) and β- (B) chains in the range of -0.05 to 5 μs. The fractions were calculated based on the ν_4 band intensity in the pump-probe spectra at each delay time relative to the band intensity in the probe-only spectrum. The solid circles and squares indicate the fraction CO-bound form of the α- and β-chains, respectively. The solid lines are the best-fit to an exponential function of the form $[A + B\exp(-kt)]$ convoluted with the instrument response function. The values of A and B were estimated to be 0.13 ± 0.02 (0.12 ± 0.03) and -0.05 ± 0.06 (-0.04 ± 0.03) for α- and (β-) chains, respectively. The rates of geminate recombination k for the isolated α- and β-chains were 17 ± 39 and 2.9 ± 7.6 μs^{-1}, respectively. Inset: Magnified views of fractions of the CO-bound form of the isolated chains in the range of 0.0 to 0.2 μs.