Supporting Information

Coordination of the Biliverdin D-ring in Bacteriophytochromes

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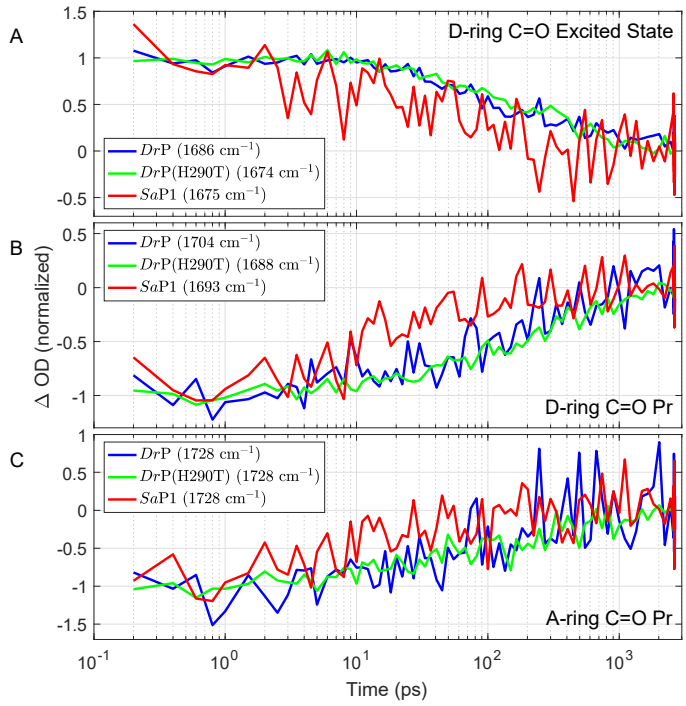

Figure SI 1, Normalized time traces of the IR signals of the carbonyl groups of the biliverdin at the excited state absorption (A), at the bleach of the D-ring (B), and at the bleach of the A-ring (C), of the *Dr*P $_{PSM}$ (blue), *Dr*P(H290T) $_{PSM}$ (green), and *Sa*P1 $_{PSM}$ (red) samples. The data shows that the excited state decay is faster in the case of *Sa*P1 $_{PSM}$ than the samples from *Dr*P $_{PSM}$, which show very similar decay profile irrespective to the H290T mutation.

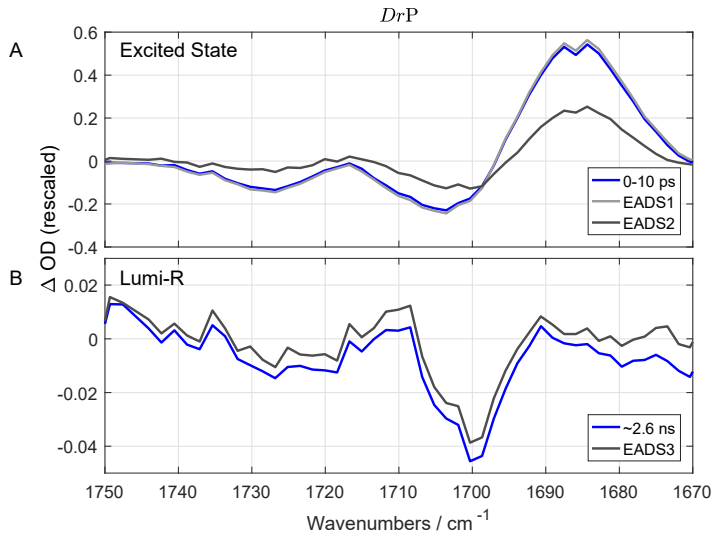

Figure SI 2, Comparison of the Evolution associated difference spectra and the raw spectral data at the early time points (A) and at the late time-points (B) of *Dr*P $_{PSM}$. The 2.6 ns spectral information is obtained by integrating signals from 30 different time-points within a distribution of 5 ps around the 2.6 ns. The detected spectrum at 1-10 ps overlays very well with the EADS and the spectral difference between EADS1 and EADS2 pinpoints the need of introduction of a second time-component to the analysis.

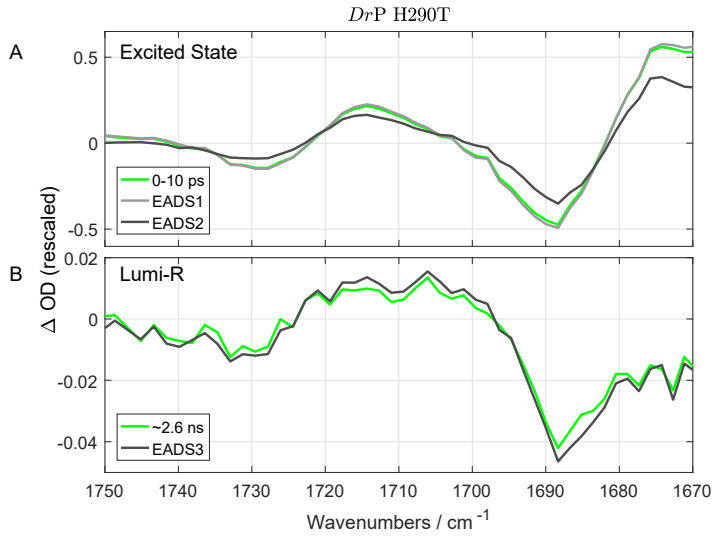

Figure SI 3, Comparison of the Evolution associated difference spectra and the raw spectral data at the early time points (A) and at the late time-points (B) of *Dr*P(H290T) $_{PSM}$. The 2.6 ns spectral information is obtained by integrating signals from 30 different time-points within a distribution of 5 ps around the 2.6 ns. The detected spectrum at 1-10 ps overlays very well with the EADS and the spectral difference between EADS1 and EADS2 pinpoints the need of introduction of a second time-component to the analysis.

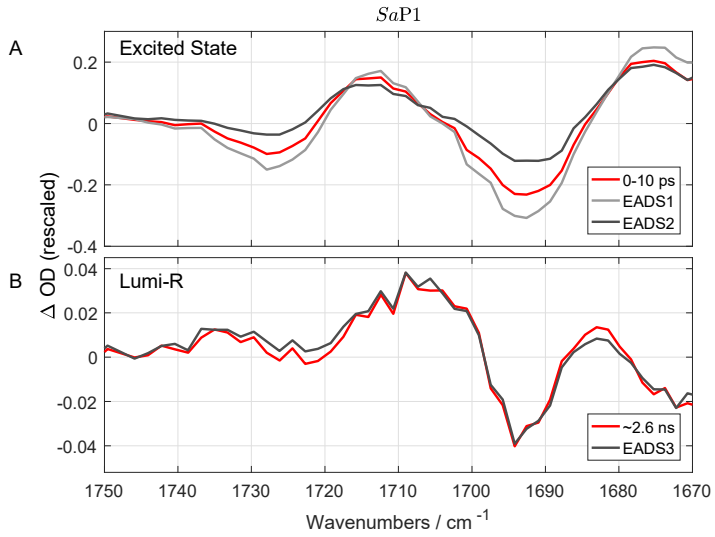

Figure SI 4, Comparison of the Evolution associated difference spectra (EADS) and the raw spectral data at the early time points (A) and at the late time-points (B) of *Sa*P1$_{PSM}$. The 2.6 ns spectral information is obtained by integrating signals from 30 different time-points within a distribution of 5 ps around the 2.6 ns. The spectral shape, detected at 1-10 ps , follows the spectral features of the EADS1. However, as the lifetime of the EADS1 is clearly shorter, the amplitude of the EADS1 is larger.