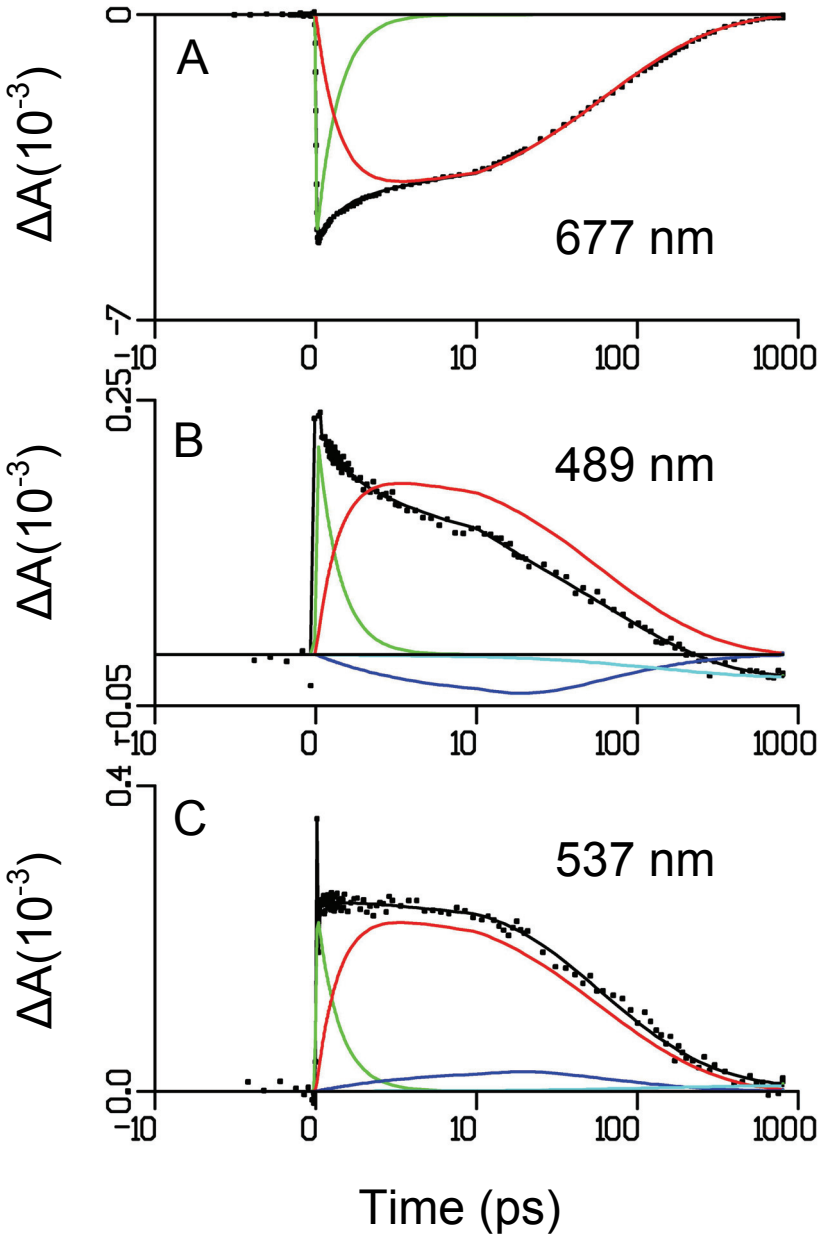

Figure S 1
Target analysis results for sample 2 at 677, 489 and 537 nm. Solid black curve represents fit to data points. The time axis is linear till 10 ps and logarithmic thereafter. Chl1, Chl2, Q and T contributions are indicated by green, red, blue and cyan curves.

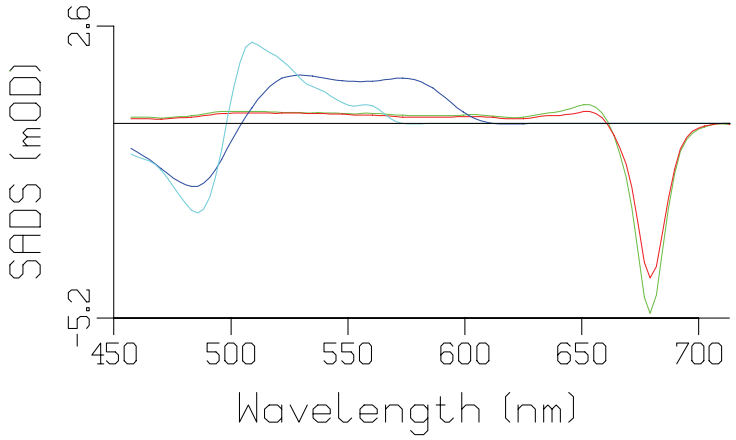

Figure S 2
Target analysis results for sample 2. Estimated Chl1, Chl2, Q and T species associated difference spectra (SADS) are indicated by, respectively, green, red, blue and cyan curves.

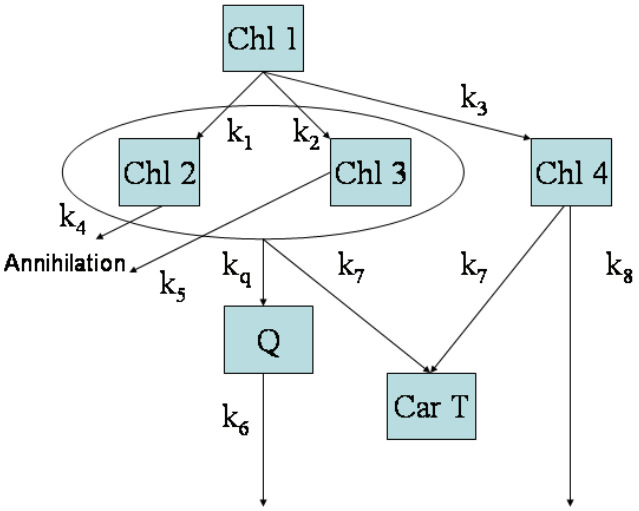

Figure S 3
The kinetic model applied for a simultaneous analysis of samples in different quenching states. The excitation at time zero sits on the Chl1 compartment, and is distributed to the three compartments Chl2, Chl3 and Chl4 (in about 1 ps) with rate constants k_1, k_2 and k_3 respectively. In the fit k_1, k_2 and k_3 are allowed to vary to reflect the change in quenching and annihilation in the various samples upon aggregation. Chl2 and Chl3 are quenched via the quenching state with a rate constant k_q. Both Chl2 (fast) and Chl3 (slow) contain an annihilation channel to account for the multi-exponential character of singlet-singlet annihilation (rate constants k_4 and k_5 respectively). Both compartments also populate the long-living triplet state with a rate constant k_7 corresponding to a very small yield. Chl 4 represents the unquenched chlorophyll, which is present in unquenched or mildly quenched samples. It populates the long-living triplet state with a rate constant k_7 and decays to the ground state with rate constant k_8. The rate constant k_8 which is also present with Chl2 and Chl3 has been omitted for clarity. The rate constants that were estimated by fitting the observed kinetics are reported in Table S 1.

Table S 1:
Rate constants obtained from the kinetic model in Figure S 3 for strongly quenched sample 1 with relative fluorescence yields (Kd) of 9. Estimated error in the rate constants k_1, k_2, k_3, and k_q is about 10%, the other rate constants were fixed.

	sample 1
k_1	$(2.39ps)^{-1}$
k_2	$(1.3ps)^{-1}$
k_3	$(51.8ps)^{-1}$
k_4	$(25ps)^{-1}$
k_5	$(400ps)^{-1}$
k_q	$(217ps)^{-1}$
k_6	$(8ps)^{-1}$
k_7	$(10ns)^{-1}$
k_8	$(10ns)^{-1}$