INDUCTION OF EFFICIENT ENERGY DISSIPATION IN THE ISOLATED LIGHT HARVESTING COMPLEX OF PHOTOSYSTEM II IN THE ABSENCE OF PROTEIN AGGREGATION

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Running head: Energy Dissipation in LHCII antenna

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SUPPLEMENTRY DATA

Figure 1S. Absorption spectra of LHCII samples possessing diferent degrees of fluorescence quenching (numbers on and above the traces correspond to $\mathbf{k_d}$ values). Quenching was achieved by incubation of samples in detergent-absorbing resins (SM-2 Absorbent, see *Materials and Methods*). The red trace is the absorption spectrum of trimers polymerised and quenched in the gel. The blue trace corresponds to the spectrum of unquenched LHCII trimer. Inset: electron micrograph of 10 -fold quenched LHCII aggregates. The everage particle size is 26 nm. The amount of light scattering in the 10-fold quenched LHCII in the gel was almost the same as that of the unquenched trimer and even much smaller than that of a 3-fold quenched aggregate. In the solution, 10-fold quenched LHCII is in the aggregated state. The average aggregate particle contained 7-9 trimers. The data indicate that the quenching observed in the LHCII in the gel is largely independent from the aggregation process.

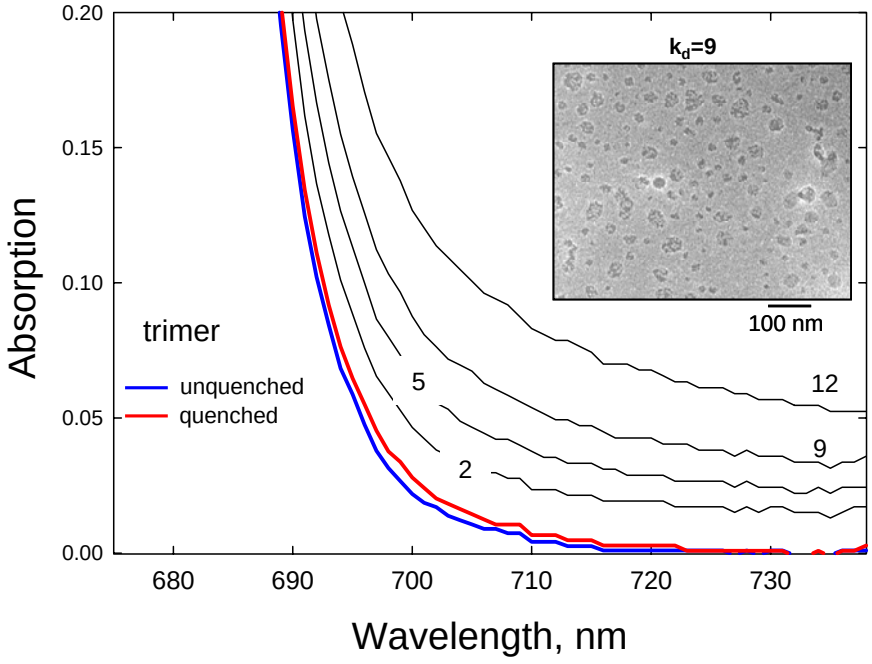

Figure 2S. Dependency of the rate of LHCII fluorescence quenching induced by dilution into the low-detergent medium upon the chlorophyll (protein) concentration. The upper graph shows fluorescence traces for LHCII at different concentrations (numbers by each trace). The lower graph displays the rate of quenching *vs* chlorophyll concentration. The final detergent concentration was 5 μM (β-DM). This figure shows that the rate of LHCII transition into the quenching state increases with the protein dilution. This is completely opposite to the anticipated dependency if protein-protein interactions were the cause of the quenching; in this case the rate of quenching should *increase* in poportional to the protein concentration. The reason for the increase in the rate of quenching upon dilution can be explained by a greater exposure of single LHCII units (trimers) to the polar environment of the medium. Hence, in the more concentrated state, enhanced protein aggregation is slowing establishment of the fully quenched LHCII conformation. This likely to be due to the decrease in the polar environment exposure of the hydrophobic protein domains in LHCII aggregates.