Electronic Supplementary Material (ESI) for Photochemical & Photobiological Sciences.

Supplemental Data (Hisatomi and Furuya)

Table S1 Nucleotide sequences of oligonucleotide primers and Alexa647-labeled oligonucleotides used in this study.

bPd/YFP-F	5'-GCCGTAAAATGGCTAGCAAAGGAGAA-3'
bPd/mCh-F	5'-GCCGTAAAATGGTGAGCAAGGGCGAG-3'
bPd/YFP-R	5'-TAGCCATTTTACGGCGCAGCATGTT-3'
bPd/mCh-R	5'-TCACCATTTTACGGCGCAGCATGTT-3'
pET-ter-F	5'-GCTAACAAAGCCCGAAAGGAAGCT-3'
pET-ter-R	5'-TCGGGCTTTGTTAGCAGCCGGATC-3'
pET-bPd-R	5'-TGCTGCCCATGGTATATCTCCTTCTTAAA-3'
pET-bPd-F	5'-ATACCATGGGCAGCAGTGAACTGACCGAA-3'
bPdflxLinker-F	5'-GGAGGTGGAGGTGGATCTATTAGCAGTGAACTG-3'
YFPflxLinker-R	5'-TCCACCTCCACCTCCGCCCATGGAGTTGTACAG-3'
mChflxLinker-R	5'-TCCACCTCCACCTCCGCCCATGGACTTGTACAG-3'
647-Apo	5'-GCTGTCTGACGTCAGACAGC-3'
647-Cpo	5'-GCTGTGCAGATCTGCACAGC-3'

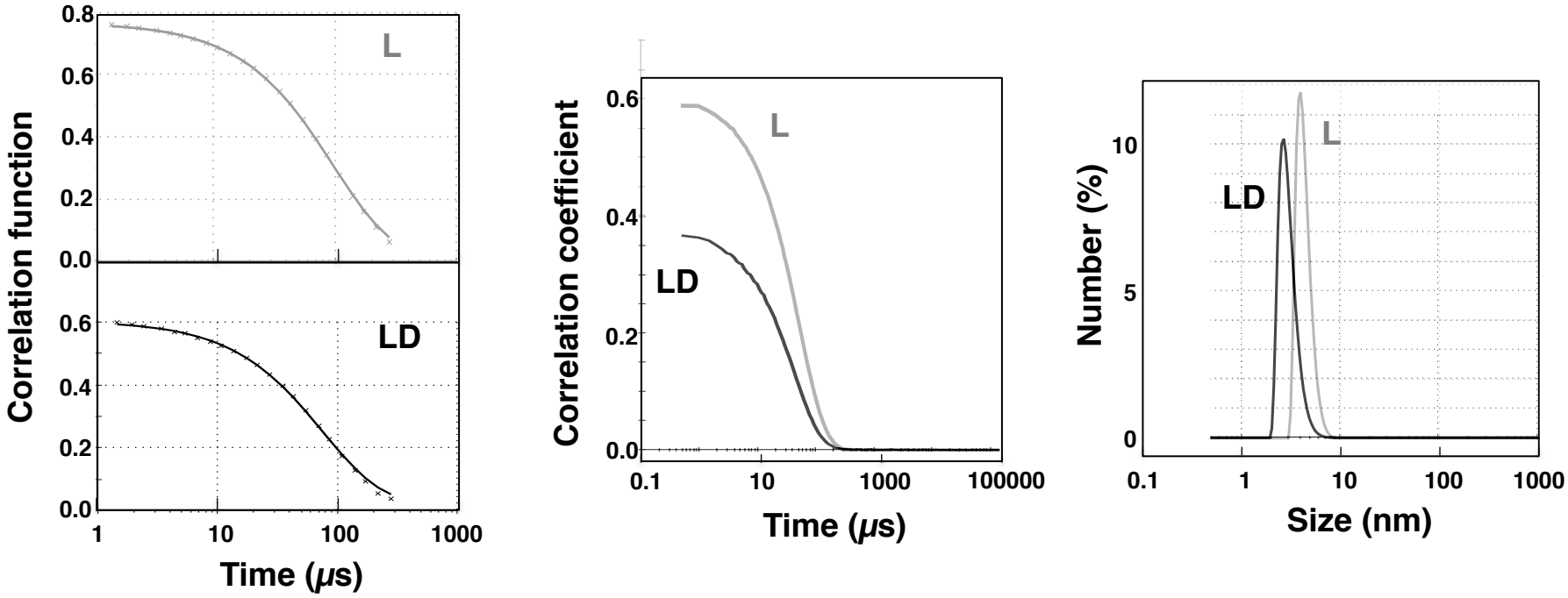

Fig. S1 Typical (A) fitting curves, (B) correlation coefficients and (C) estimated size distributions of fusion PZ (PZ-mCh) in the light (gray lines) and LD (black lines) states. Correlation function that could be fit by a single exponential decay was used to obtain $R_{H(app)}$, the mean size (*z*-average radius) of each measurement. DLS data resulting in a width of the assumed Gaussian distribution (polydispersity index) by the Cumulants analysis larger than 0.3 were omitted. The $R_{H(app)}$ in each protein concentration was calculated for at least six measurements. Standard deviations of all $R_{H(app)}$ values obtained from the multiple measurements were less than 0.05 nm.

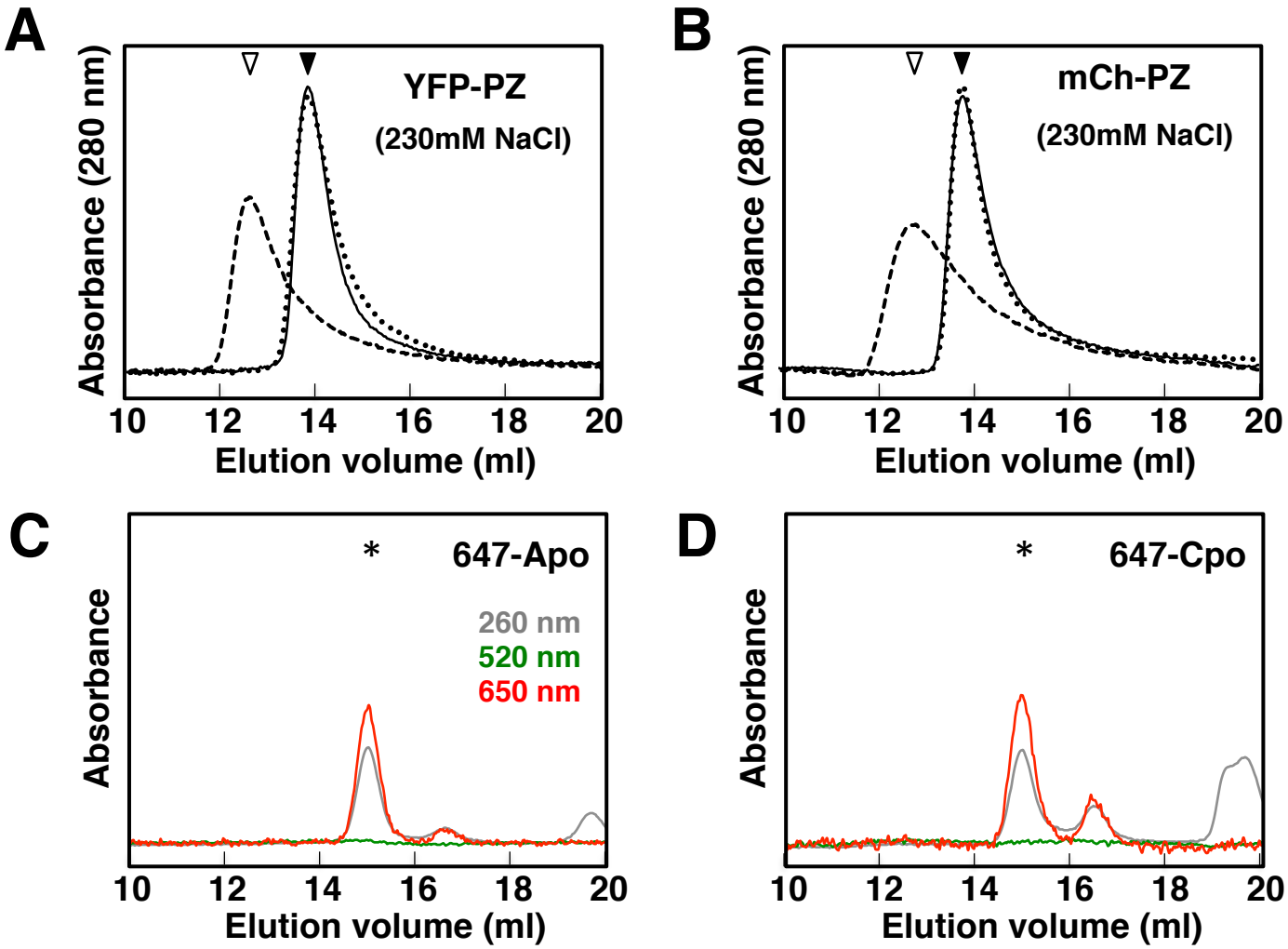

Fig. S2 Elution profiles of (A) YFP-PZ and (B) mCh-PZ in SEC buffer containing 230 mM NaCl, in the dark state (thin solid lines), the light state (broken lines), and the light-dark state (dotted lines), monitored at 280 nm. Elution profiles of 647-Apo (C) and 647-Cpo (D) in SEC buffer containing 300 mM (for C-fusion PZs) or 230 mM (for N-fusion PZs) NaCl, monitored at 260 (gray), 520 (green), and 650 (red) nm. The asterisk indicates the peak elution volume in the absence of proteins.

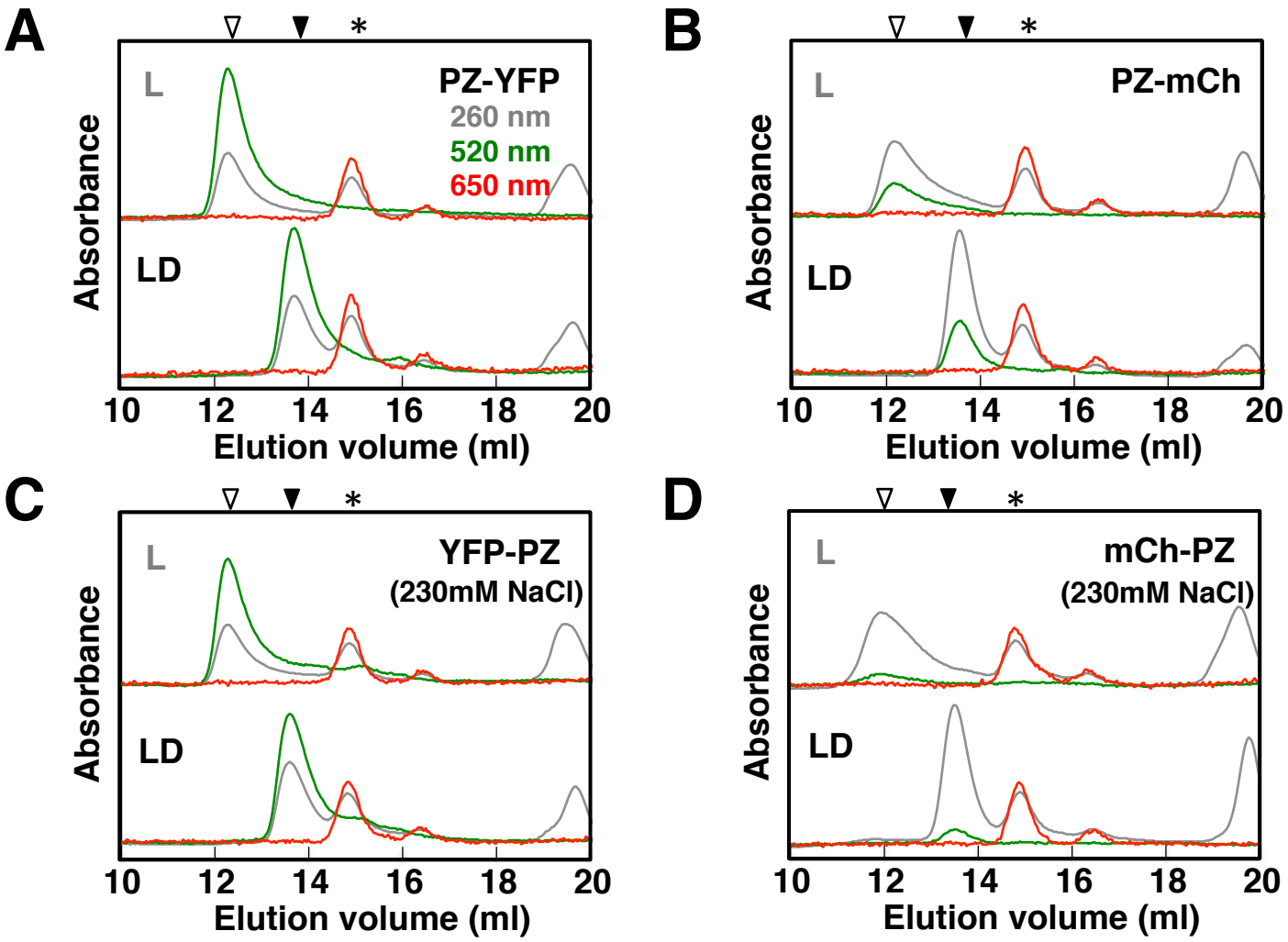

Fig. S3 Elution profiles of (A) PZ-YFP, (B) PZ-mCh, (C) YFP-PZ, and (D) mCh-PZ incubated with 647-Cpo in the presence of 300 mM (A and B) or 230 mM (C and D) NaCl, in the light (upper) and LD (lower) states. Monitoring wavelengths were 260 nm (gray lines), 520 nm (green lines), and 650 nm (red lines). Inverted triangles indicate the peak elution volumes of fusion PZs in the dark (closed) and light (open) states, and asterisks designate the peak elution volume of double-stranded 647-Cpo.

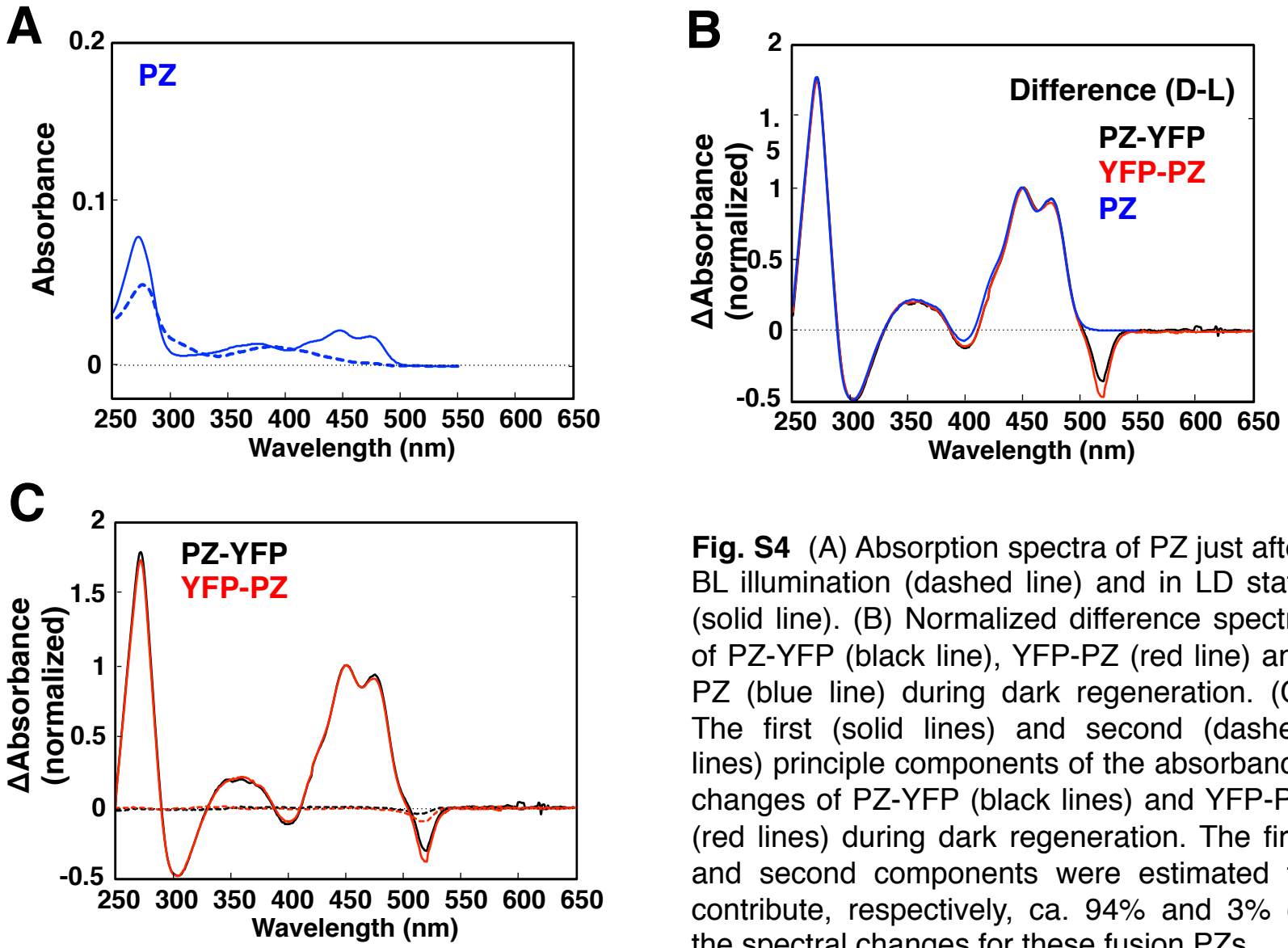

Fig. S4 (A) Absorption spectra of PZ just after BL illumination (dashed line) and in LD state (solid line). (B) Normalized difference spectra of PZ-YFP (black line), YFP-PZ (red line) and PZ (blue line) during dark regeneration. (C) The first (solid lines) and second (dashed lines) principle components of the absorbance changes of PZ-YFP (black lines) and YFP-PZ (red lines) during dark regeneration. The first and second components were estimated to contribute, respectively, ca. 94% and 3% of the spectral changes for these fusion PZs.