Supplementary Information:

**Fig. S1** Two-dimensional $^{15}\text{N}-^{1}\text{H}$ HSQC NMR spectra (amide region) of $^{15}\text{N}$-labeled NpF2164g3 in the violet-absorbing dark state recorded at 600 MHz proton frequency. Side chain amide resonances of Asn and Gln are connected with solid lines. Representative assignments are indicated; complete assignments are available as BMRB accession no. 19629.
Fig S2. $^{13}$C-$^1$H INEPT NMR spectra of NpF2164g3 with attached bilin chromophore containing $^{13}$C-H labeling (at C5, C10, and C15) in the dark-adapted violet state (A) and light-activated orange state (B).