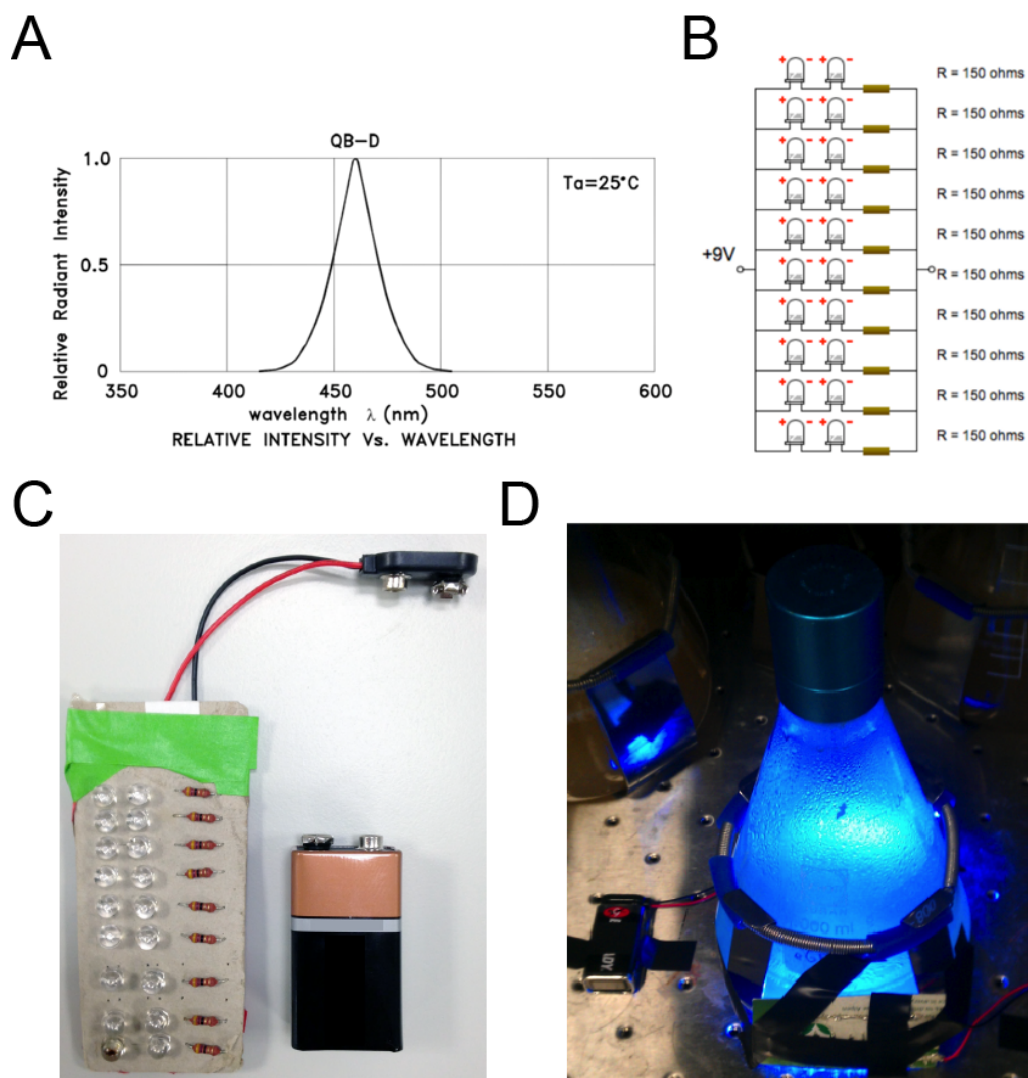
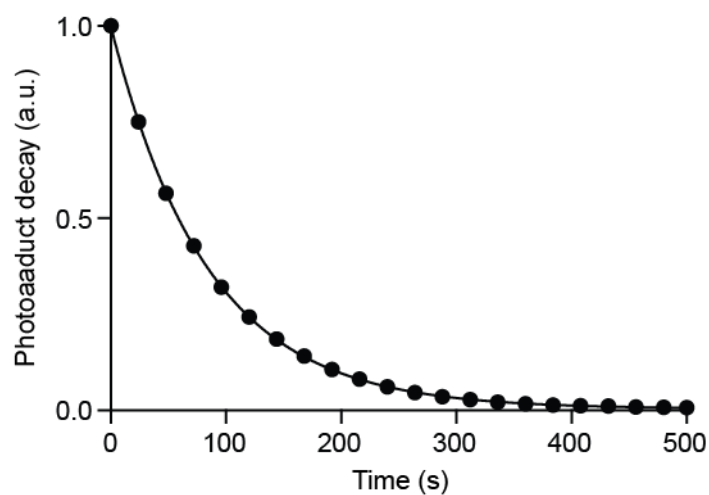


Post-translational control of protein function with light using a LOV-intein fusion protein.

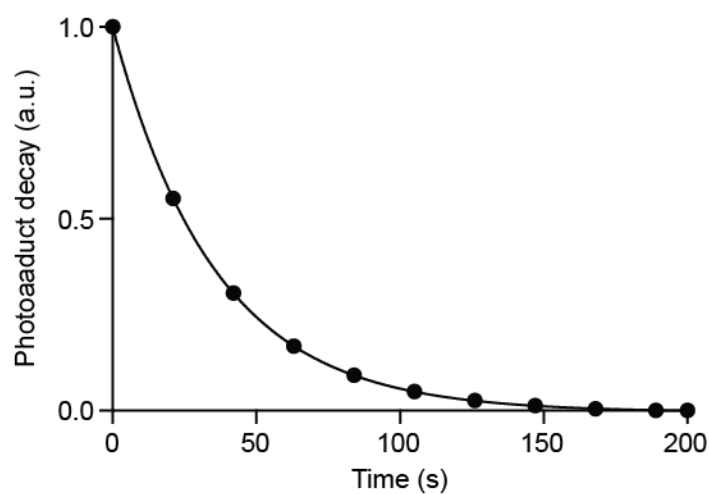
Supplementary Figures



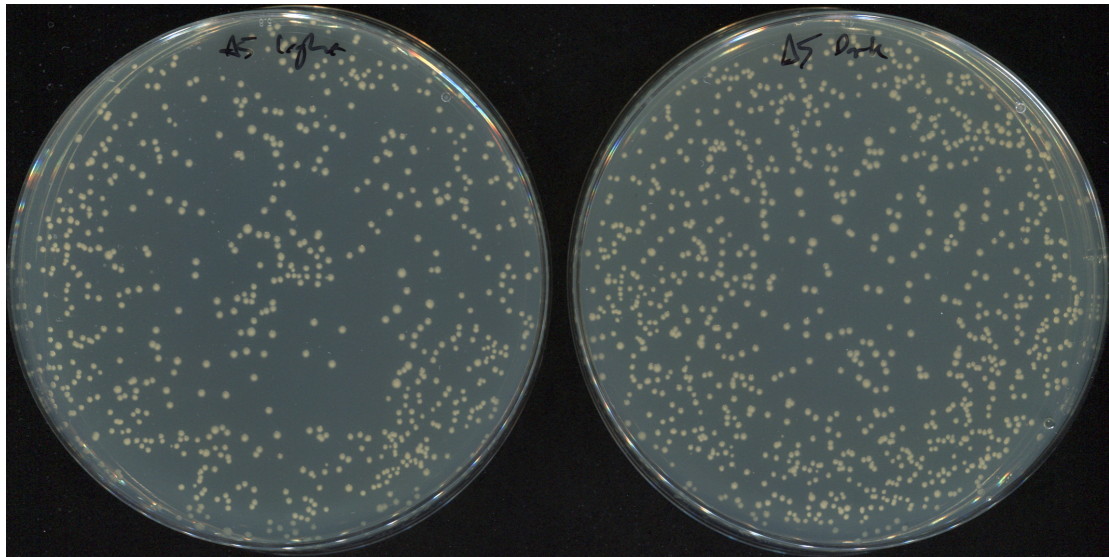
Supplementary Figure 1. LED array. A) light emission spectrum of InGaN LED bulb. B) LED array design. C) LED array used in this study composed of high emission low power InGaN LED bulb, with each bulb having an output of 500 mcd and a viewing angle of 60° . The array was built from 9 pairs of LEDs with 0.25W resistors in parallel powered by a 9V battery. D) example of *E. coli* cultures grown under blue light.



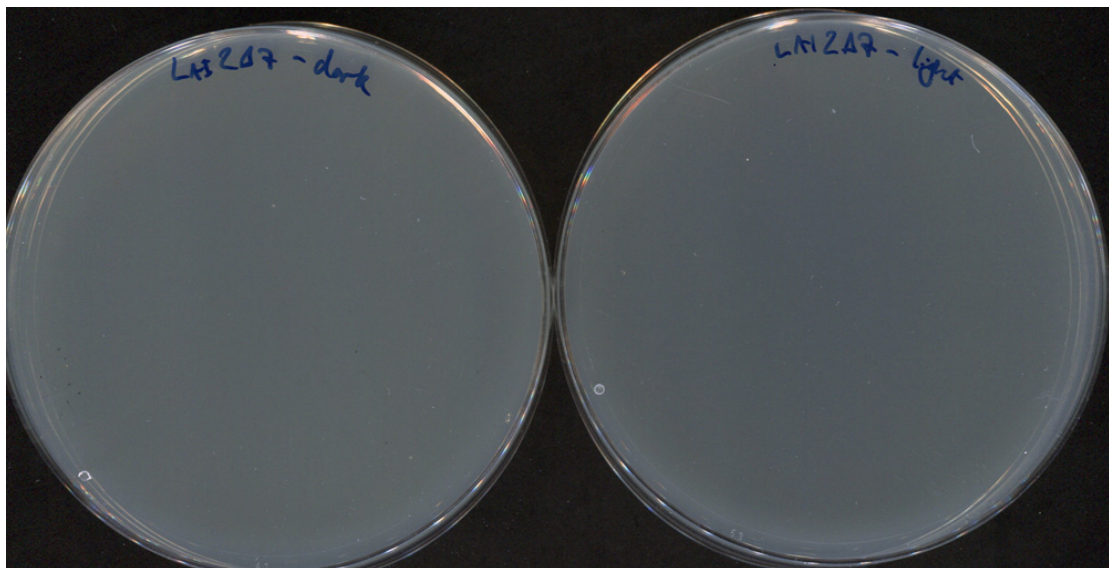
Supplementary Figure 2. Kinetics of photo-adduct decay of LOV2 to dark state monitored by LOV2 domain absorption at 447nm. The half life of the photo-adduct of LOV2 is 58 ± 0.3 seconds.



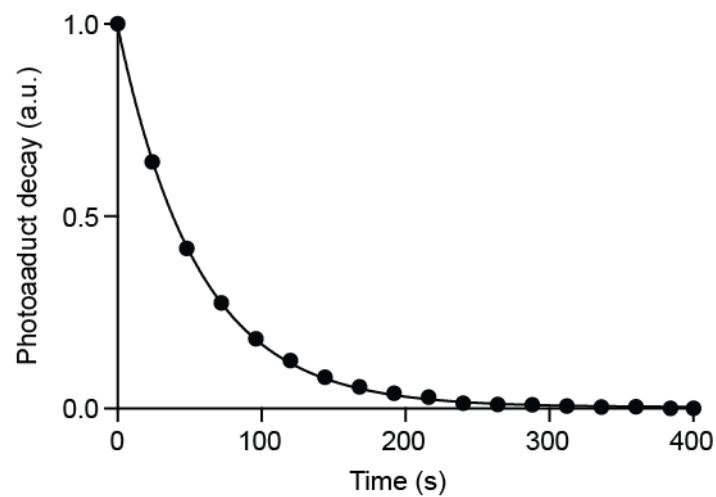
Supplementary Figure 3. Kinetics of photo-adduct decay of the LOV-intein fusion to dark state monitored by LOV2 domain absorption at 447nm. The half life of the photo-adduct of LOV-intein is 24 ± 0.1 seconds.



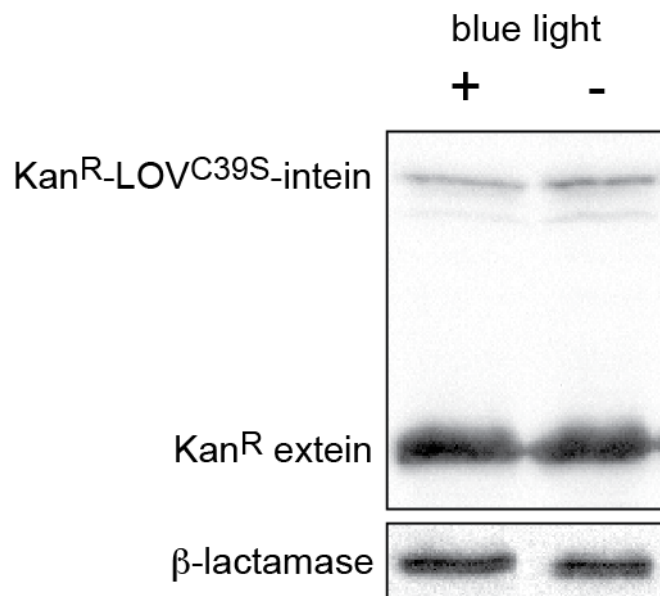
Supplementary Figure 4. Overnight growth of bacteria transformed with the Kan^R- LOV- $\Delta 5$ intein plasmid, incubated under blue light (left), or in the dark (right).



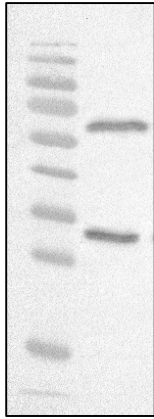
Supplementary Figure 5. Overnight growth of bacteria transformed with the Kan^R- LOV- $\Delta 7$ intein plasmid, incubated in the dark (left), or under blue light (right).



Supplementary Figure 6. Kinetics of photo-adduct decay of LOV-Δ6intein protein to dark state monitored by LOV2 domain absorption at 447nm. The half life of the photo-adduct in LOV-Δ6intein is 38 ± 0.7 seconds.



Supplementary Figure 7. Western blot analysis of His-tagged proteins expressed in *E. coli* from the Kan^R-LOV^{C39S}-intein plasmid. Beta-lactamase, which is expressed from the same plasmid is used as a loading control.



Supplementary Figure 8. Western blot analysis of His-tagged Kan^R-LOV-Intein expressed in *E. coli* overlaid onto molecular markers. The molecular marker bands (from bottom to top) are 25, 35, 40, 56, 70 kDa. The bottom band is the Kan^R extein, the top band is the full length unspliced protein.

Sequence

The sequence of the InN-LOV-Δ6InC protein used in this study is given below.

CLSYDTEILTVEYGILPIGKIVEKRIECTVYSVDNNGNIYTQPVAQWHDRGEQEVFEY
CLELGCLIRATKDHKFMTVDGQMMPIDEIFERELDMRVDNLPNGTIKLATTLERIEK
NFVITDPRLPDNPIIFASDSFLQLTEYSREEILGRNCRFLQGPETDRATVRKIRDAIDNQ
TEVTVQLINYTKSGKKFWNLFHLQPMRDQKGDVQYFIGVQLDGTEHVRDAAEREGV
MLIKKTAENIDEAAKELAAMKYLKGQNVYDIGVERYHNFALKNGFIASN

Your extein of choice should be split in two and incorporated either side of the above sequence. Please note that intein splicing requires either a C or S to be present as the first amino acid of the C-extein.