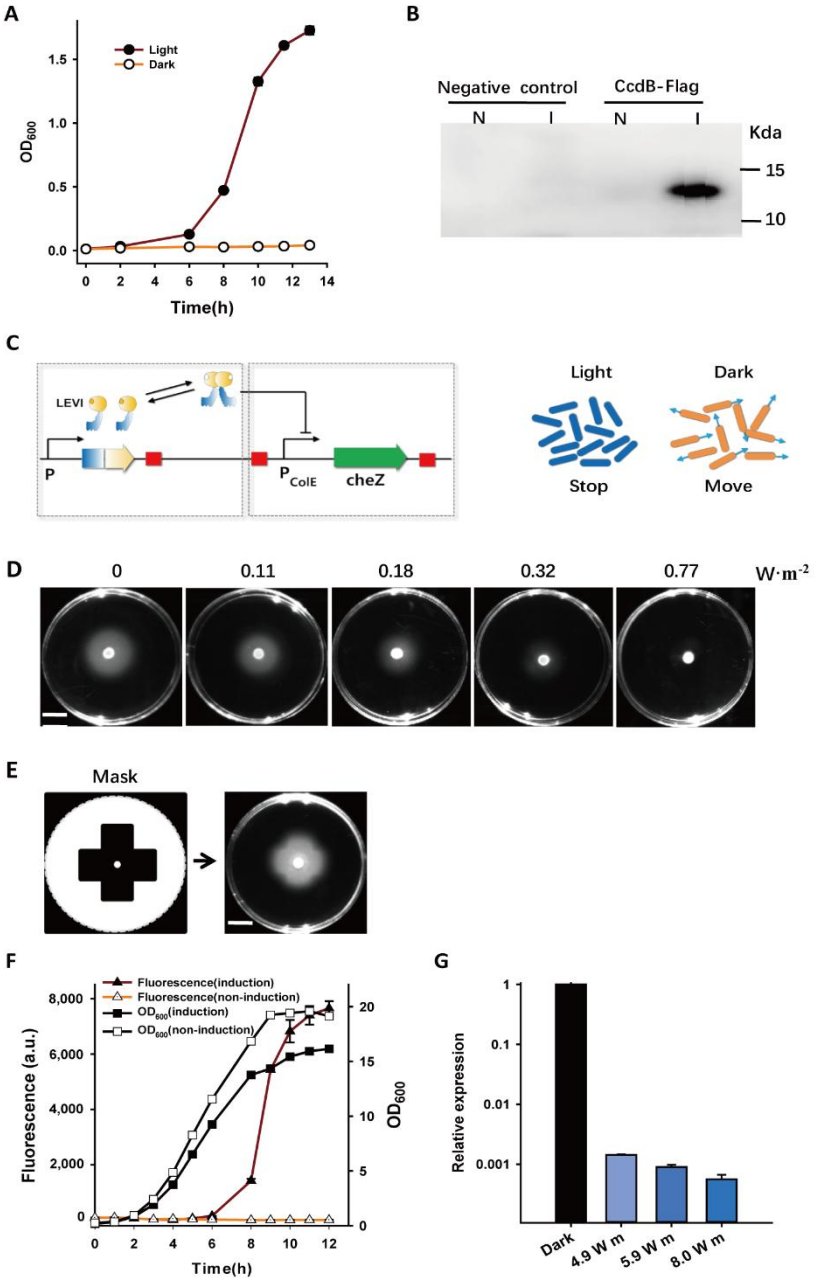
Supplementary Figure 2



Supplementary Figure 2 Application of LightOff system in many quantitative and synthetic biology studies.

(**A**) and (**B**) Expression of toxic protein by LightOff system. **(A)** The toxicity of CcdB-flag to *E.coli* cells. Error bars, mean ± s.e.m. from three independent experiments. **(B)** Detection of CcdB-flag expression from LightOff system by western blot. Lysates were derived from non-induced (N) or induced (I) cells. Cells transformed with pCDFDuet 1 empty vector were used as the negative control. (**C-E**)

Controlling bacteria mobility using LightOff system. **(C)** Expression of cheZ protein, which plays an important role in bacteria mobility, was under the control of LightOff system. **(D)** The engineered bacteria were spotted onto the semisolid media and kept in different light irradiance for 18 h before imaging. **(E)** The engineered bacteria were cultured using a printed mask with a specific image as the “light guide”. Scale bars in (b) and (c), 1 cm. (**F**) Large-scale production of recombinant protein using fermenter by LightOff system. *JM109(DE3, ΔsulA, ΔLexA)* cells transformed with pLEVI-mCherry vector, 5% (v/v) of the seed culture was inoculated to 5-L fermenter. The cells were illuminated with blue light illumination or transferred to dark condition to induce mCherry expression when OD_{600} reached ~0.2. Fluorescence and OD_{600} were measured at indicated time points. Error bars, mean ± SD (*n*=3 samples) from the same experiment. a.u., arbitrary units. (**G**) More stringent control of gene expression with higher light intensity by LEVI (I74V). *E.coli* cells were cultured in darkness or upon 4.9 W m^{-2}, 5.9 W m^{-2} or 8.0 W m^{-2} blue light exposure. Data were normalized to the mCherry expression in dark conditions. Error bars, mean ± s.e.m. from three independent experiments.