



## LITE Switch Gene Expression Kit Overview:

Optologix introduces the LITE Switch Expression Kit, a blue light-inducible gene expression system for eukaryotic cells. The system overcomes the limitations of conventional inducible systems by enabling robust spatial and temporal regulation of gene transcription in cultured cells and model organisms.

LITE Switch uses an engineered version of EL222, a bacterial photosensor protein that binds specifically to the C120 promoter when illuminated with blue light (450–495 nm). The engineered EL222 transactivator was first described in Motta-Mena et al., 2014.

A new second generation EL222 transactivator called VEL is now part of the LITE Switch System. The VEL protein consists of the transcriptional activation (AD) from the VP16 protein fused to an optimized EL222. Cells that express VEL and contain a gene of interest under the control of the C120 promoter will express high levels of the gene of interest, but only when cells are illuminated with blue light. In the dark, the system shows low basal activity (<2-fold). VEL provides a higher protein fold induction than the first generation VP-EL222 protein (>300-fold vs. 100-fold, Fig. 1).

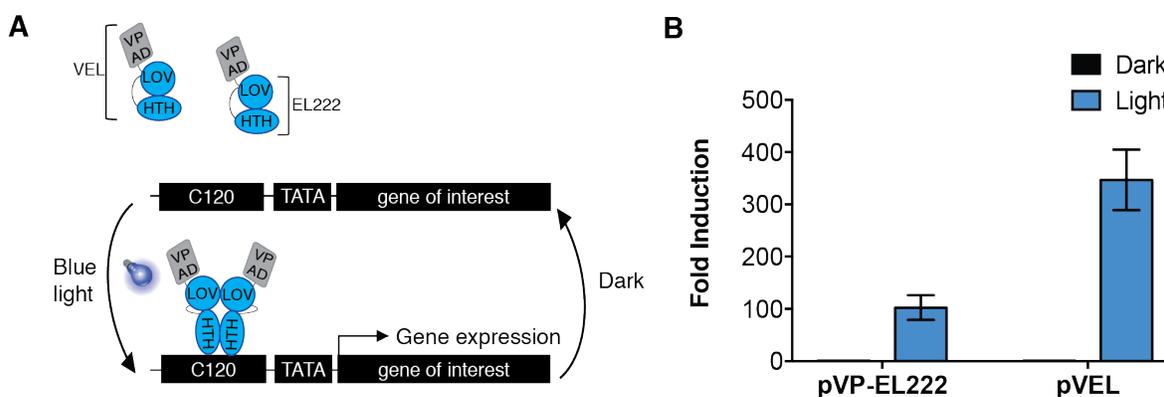


Fig. 1. The LITE Switch System enables inducible gene expression upon stimulation with blue light. A) In the dark, the VEL protein is unable to bind its target C120 promoter; however, exposure to blue light triggers a conformational change in the protein that allows it bind the C120 promoter and turn on transcription of a downstream gene. B) The VEL transactivator provides a higher fold induction (3x) than the VP-EL222 protein previously described in Motta-Mena et al. (2014) *Nat Chem Biol* 10 (3): 196–202. Following transfection with either pVP-EL222 or pVEL and pC120-Fluc, 293T cells were illuminated with pulsed blue light for 18 hr (465 nm; 20 s on, 60 s off; 2.9 mW/cm<sup>2</sup>).

### References:

Motta-Mena et al. (2014) *Nat Chem Biol*, 10 (3): 196–202.

## Optologix LITE Switch Gene Expression Kit

Available for shipping November 2016



The LITE Switch Kit includes 20 ug of each of the following plasmids and a light source:

**pVEL:** regulatory plasmid for expression of the VEL transactivator protein

**pC120:** inducible expression plasmid contains the C120 light-inducible promoter and a downstream multiple cloning site

**Light source:** 12" Blue LED panel

### **Product Features:**

- Light is a rapid and non-toxic stimulus that can be easily targeted in space and time
- Broad range of gene induction and low basal expression
- VEL transactivator quickly activates (<10 sec) and resets (<50 sec) after illumination
- Reversible induction made simpler by turning on or off of blue light source
- Reduced off-target effects compared to chemical-inducible systems