

Immobilization of the Nematode *Caenorhabditis elegans* with Addressable Light-Induced Heat Knockdown (ALINK)

Han-Sheng Chuang^{*a,b}, Hsiang-Yu Chen^a, Chang-Shi Chen^c, Wen-Tai Chiu^b

Electronic Supplementary Information (ESI)

Explanations of Movies

Movie S1

Demonstration of worm immobilization and recovery (*i.e.*, an on-off cycle). A N2 L4 stage worm is immobilized on the ALINK microchip. The experimental conditions are 20 V_{pp} at 350 kHz coupled with a 30 mW 640 nm laser. The worm is rapidly immobilized in 10s. To shorten the recovery time, the worm is irradiated by a 50 mW 447 nm violet laser. Consequently, the worm resumes its activity immediately after the irradiation.

Movie S2

Comparison of optoelectric and laser only treatments. The adult worm treated with laser only irradiation cannot be immobilized in 5s. Conversely, the worm underwent the laser irradiation in the presence of electric fields expresses rapid immobilization in 5s. Obviously, the optoelectric effect is more efficient for worm immobilization.

Movie S3

Optical effect on worm immobilization. A comparison of a wild-type worm and a light defective mutant *lite-1* treated with optoelectric conditions is performed. The light source is replaced with a violet laser (50 mW, 447 nm) because the mutant shows null responses to short-wavelength light. As a result, the wild-type worm is hard to be immobilized, whereas the *lite-1* mutant is immobilized rapidly. The outcome suggests that optical effect is negligible since it contributes little to the worm immobilization