Supplementary Material

Self-filtering illumination source and application in fluorescence imaging

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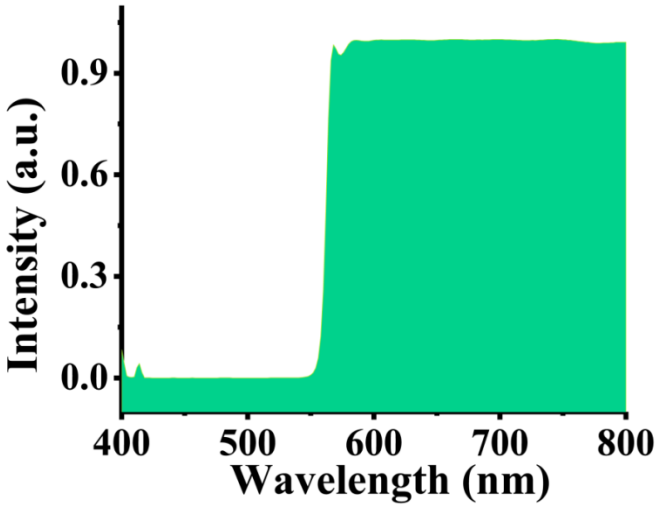

Figure S1 The transmittance spectra of the back TiO_2/SiO_2 multi-layer.

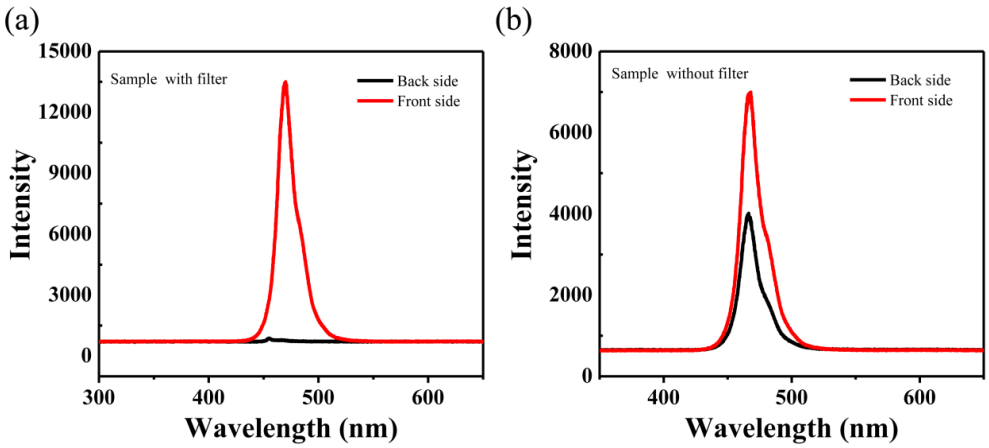

Figure S2 EL spectra of sample with or without the filter under driven current of 5 mA.

As it presented in Figure S2(a), EL of sample with filter shows peak wavelength about 470.3 nm and intensity over 13000 if we measure it from the front. While it will be decreased to 880 in intensity for if we measure it from the back. The rejection ratio is nearly 94% in this case. For the sample without filter in Figure S2(b), EL intensity is about 6800 in the front side, while it is about 4000 in the back side.

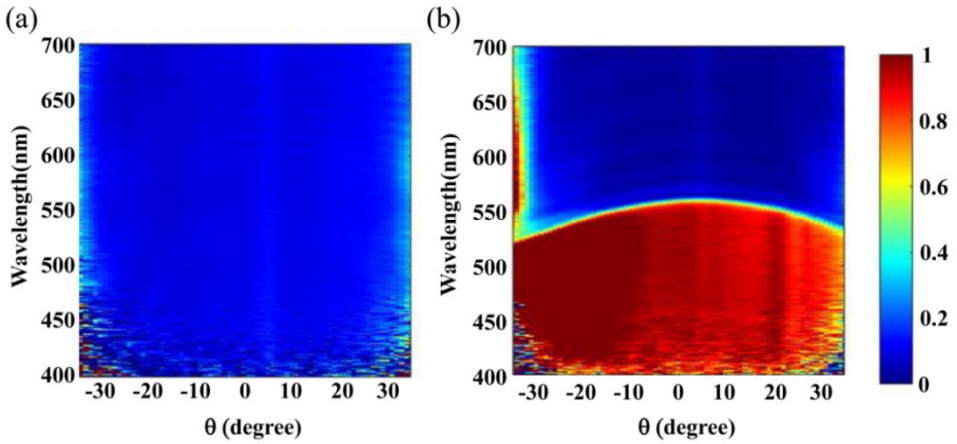

Figure S3 Measured angular-resolved reflectance spectra of the LED without (a) and with (b) filter.

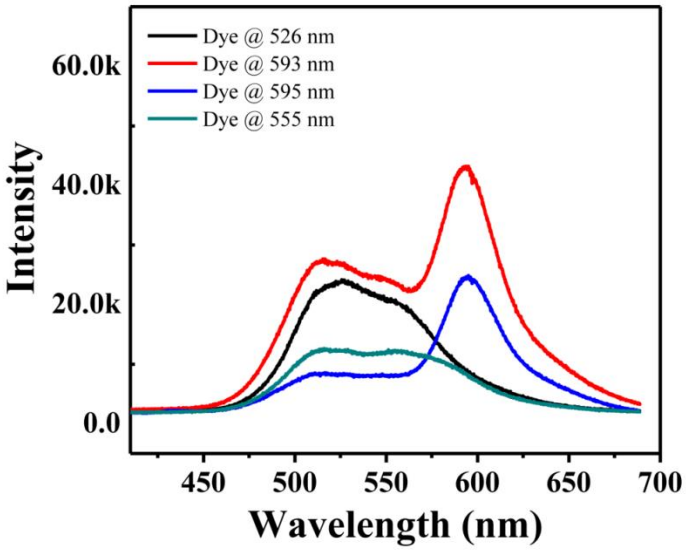

Figure S4 Fluorescent spectra of dye excited by 355 nm nanosecond laser.

During the PL measurement in Figures 3(a) and 3(b), LED with filter was used as the exciting light source and commercial fluorescent materials, $SrAl_2O_4$ (Eu, Dy), was used as the probe molecule. Since the light emission of LED is parked at 470.3 nm, and the filter's cutoff wavelength is 550 nm, the probe molecule should be emission materials with peak emission above 550 nm. PL of it was firstly measured under 355 nm laser pumping to found out suitable materials. PL measurement is carried out by a confocal micro photoluminescence (μ-PL) setup (Olympus BX35) coupled with a 355-nm laser and the excitation laser is focused onto the sample surface through a 10× objective. The PL spectra of sample is collected and resolved by a spectrometer (Princeton Instruments Acton SP2500i). As can be seen, a serious fluorescent material was gotten and the sample with central wavelength near 600 nm was chosen to conductor the further experiment.