

## Supporting Information

# Fluorescence Imaging of Latent Fingerprint on Conjugated Polymer Film with Large Fractional Free Volume

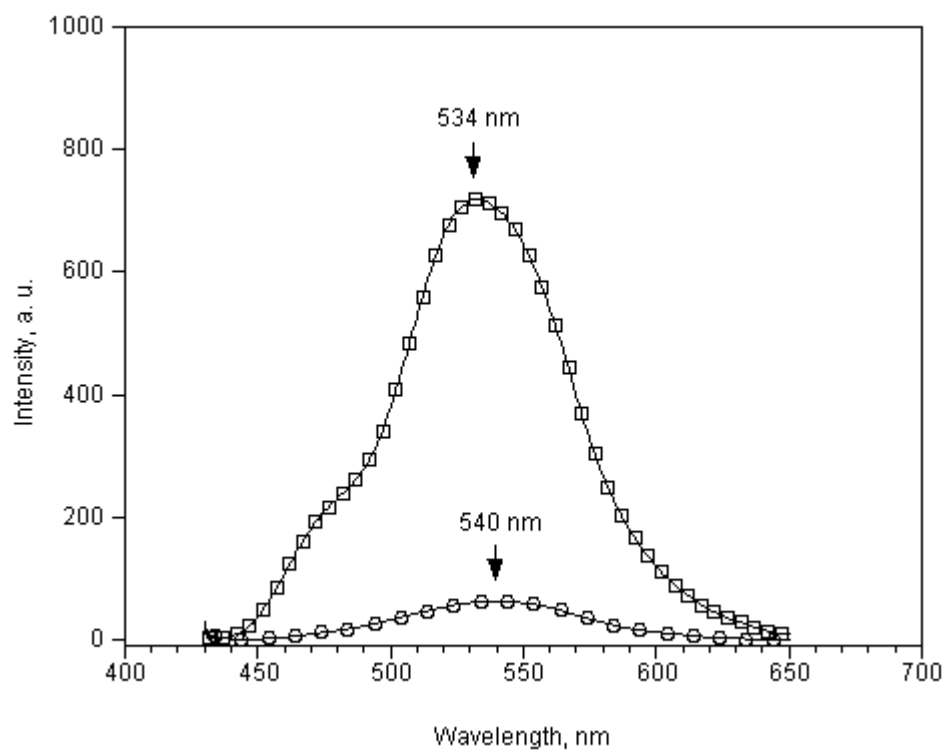
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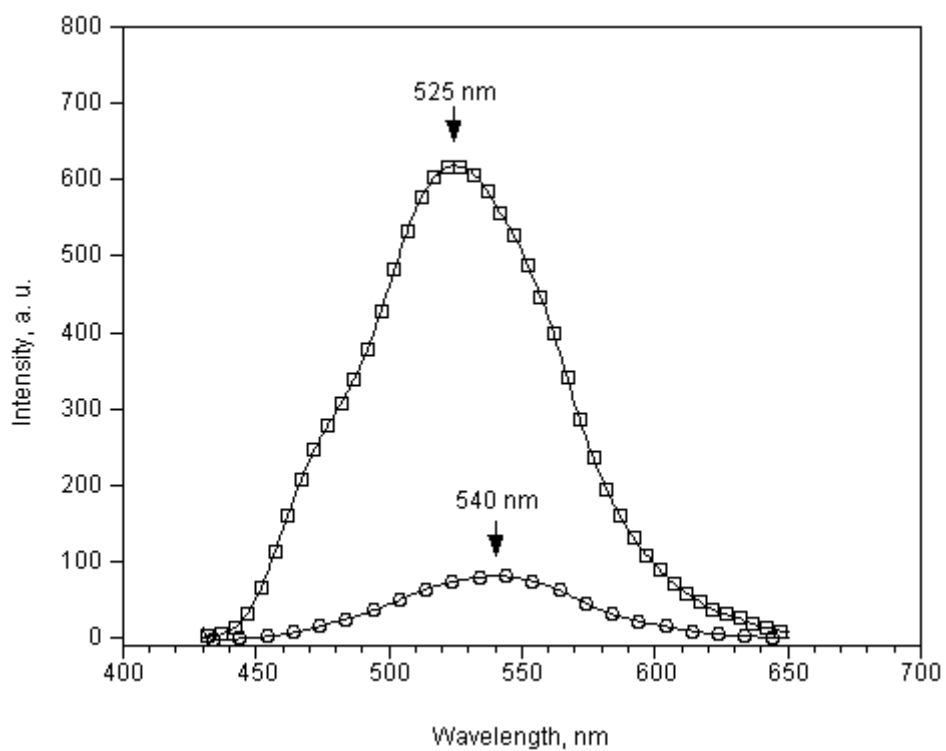
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dong, Buk-ku, Daegu 702-701, Korea*

## Experimental Section

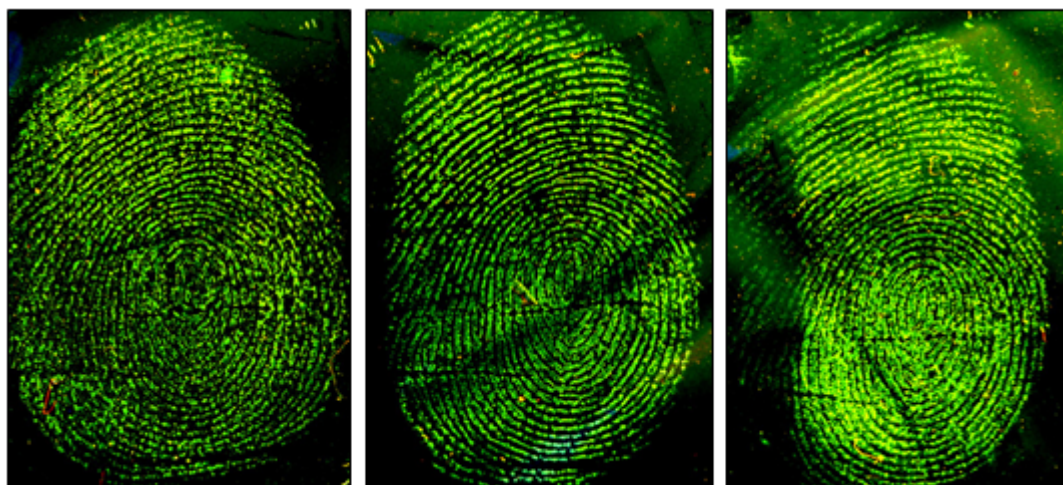
The weight-average molecular weight ( $M_w$ ) and number-average molecular weight ( $M_n$ ) of PTMSDPA were evaluated using gel permeation chromatography (Shimadzu A10 instruments (Kyoto, Japan), Polymer Laboratories (Shropshire, UK), PLgel Mixed-B with 300 mm in length as a column, and HPLC-grade tetrahydrofuran as an eluent at 40 °C), based on a calibration with polystyrene standards. The photoluminescence spectra were recorded on a JASCO ETC-273 spectrofluorometer. The fluorescence images of latent fingerprint were taken with a Samsung NV3 digital camera. The fluorescence CCD images were recorded on a Nikon Eclipse E600 fluorescence microscope equipped with a Nikon DS-Fi1 digital camera. In order to observe the dynamic change of the fluorescence image, the home-built Confocal Laser Scanning Microscopy (CLSM) was employed as the imaging apparatus. The home-built CLSM is based on the confocal detection utilizing a single pinhole in front of the detector (Hamamatsu PMT, R3896, Hamamatsu, Japan). The scanning of the beam is conducted with the fast scanning polygon mirror and a galvomometer. The water-immersing objective lens from Zeiss(C Apochromat 40X, NA 1.2) is used and the estimated lateral resolution is about 200nm. The axial resolution of the CLSM can be defined as the axial position at which the detected intensity drops as the half of the focal plane. The measured axial resolution was about 7 $\mu$ m: i.e. the CLSM is optically sectioning the image plane with the 7 $\mu$ m thickness. The imaging plan of the CLSM was placed about 5 $\mu$ m below the top surface of the film. The periodic lines in the confocal images are the artifact caused by the scanning of the laser beam over the sample.



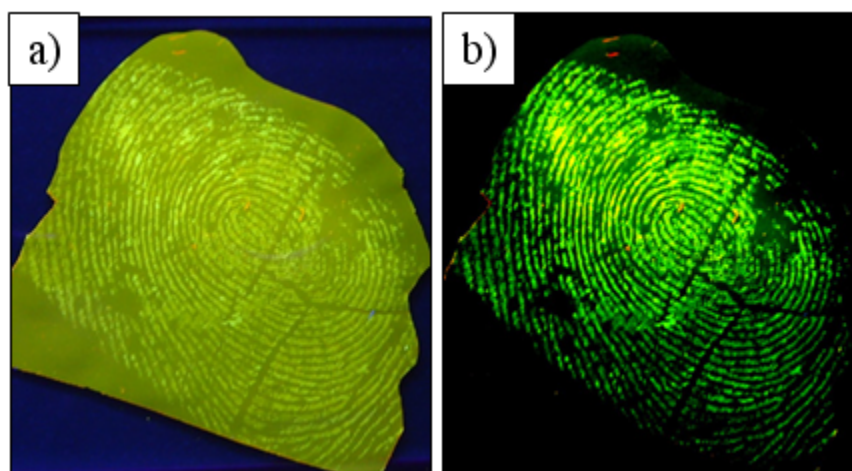
**Figure S1.** FL spectra of the PTMSDPA film before (○) and after (□) contacting to the lipid/fatty acid mixture (the film is free-standing, film thickness  $\approx 30 \mu\text{m}$ , excited at 420 nm).



**Figure S2.** FL spectra of the PTMSDPA film before (○) and after (□) contacting to the fatty acid standard (the film is free-standing, film thickness  $\approx 30 \mu\text{m}$ , excited at 4



**Figure S3** Imaging software-processed FL images of three consecutive of fingerprints (from left to right).



**Figure S4** a) Actual digital camera FL photograph and b) imaging software-processed image of the fingerprint-transferred PTMSDPA film. The latent fingerprint was thinly deposited onto the surface of slide glass after wiping the finger with Kimwipes (the film is free-standing, film thickness  $\approx 30 \mu\text{m}$ , excited at  $> 450 \text{ nm}$ ).