Supplementary Material (ESI) for Journal of Materials Chemistry


# Supporting Information

## Dye-Sensitized Bio-System Sensing Using Macroporous Semiconducting Oxides

Debraj Chandra, Makoto Bekki, Masako Nakamura, Shuji Sonezaki, Tatsuki Ohji, Kazumi Kato, and Tatsuo Kimura*

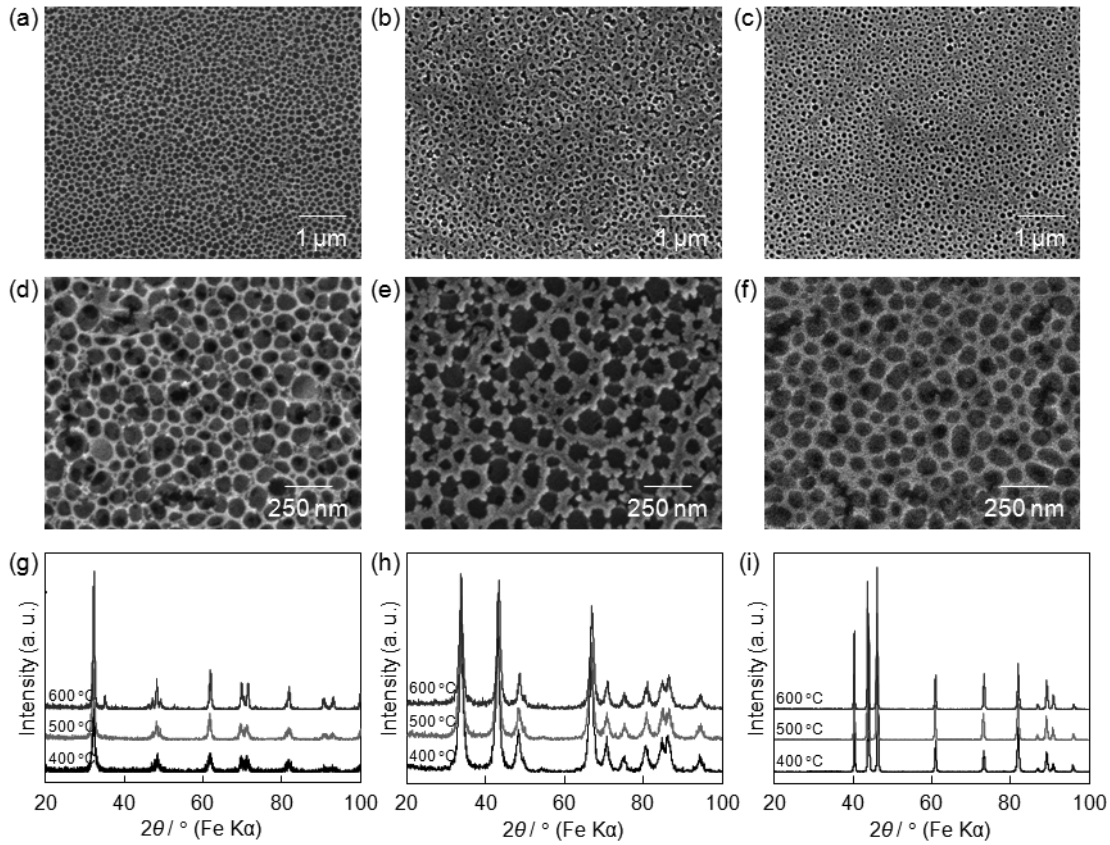


**Fig. S1** Low-magnification SEM images of (a) $TiO_2$ (400 °C), (b) $SnO_2$ (450 °C) and (c) ZnO (400 °C) with (d, e, f) those of corresponding films calcined at 600 °C, and (g, h, i) XRD patterns of those calcined at 400−600 °C.

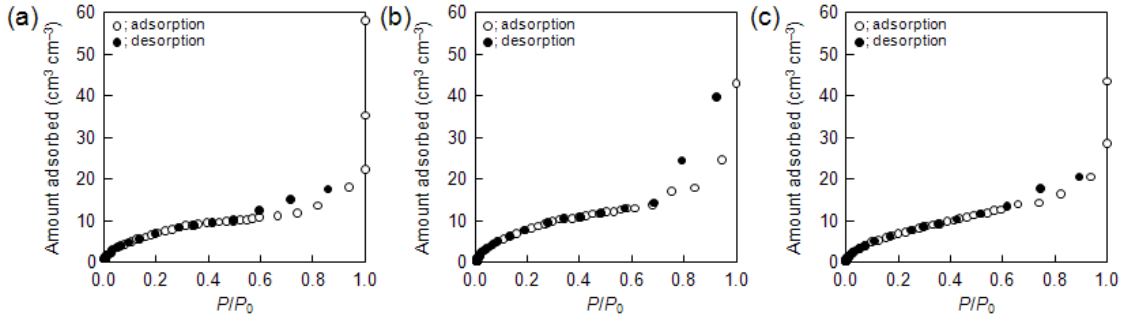


**Fig. S2** Kr adsorption-desorption isotherms at 87 K of calcined macroporus films (at 400 °C) of (a) $TiO_2$, (b) $SnO_2$ and (c) ZnO.

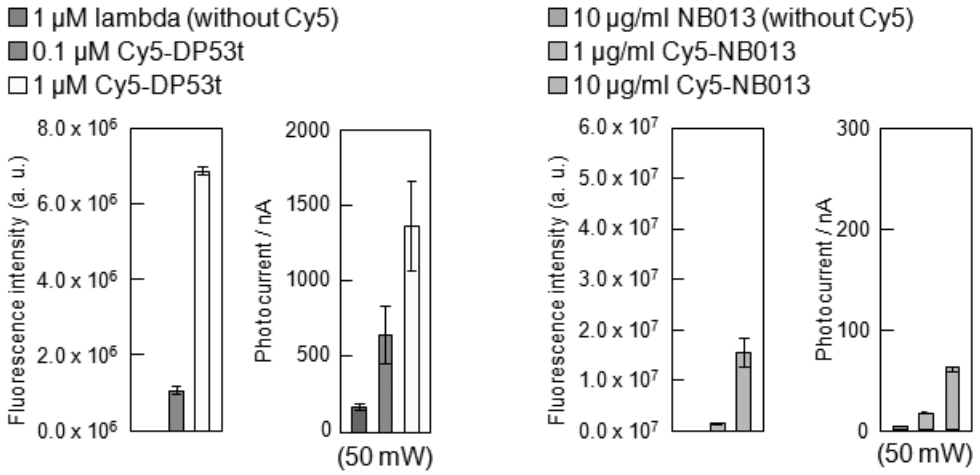


**Fig. S3** Fluorescence due to DNA (Cy5-DP53t) and antibody (Cy5-NB013) over macroporous ZnO film calcined at 400 °C and generation of photocurrent based on the DSSC system related to sensor property.

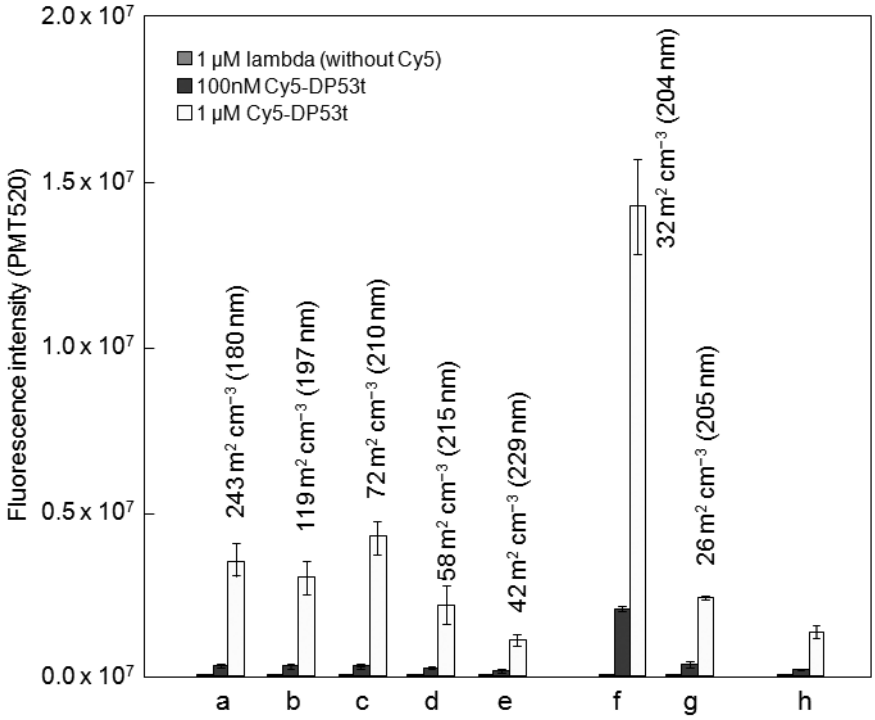


**Fig. S4** Adsorption of DNA molecule (Cy5-DP53t) over a wide range of porous films; $TiO_2$ films (calcined at 400 °C) prepared using (a) F127 alone, (b-e) F127 with 0.5, 1.0, 1.5 and 2.0 mL of 100 nm PS beads solution, those prepared using PS-*b*-PEO, followed by calcination at (f) 400 °C and (g) 250 °C, and (h) bare FTO substrate.

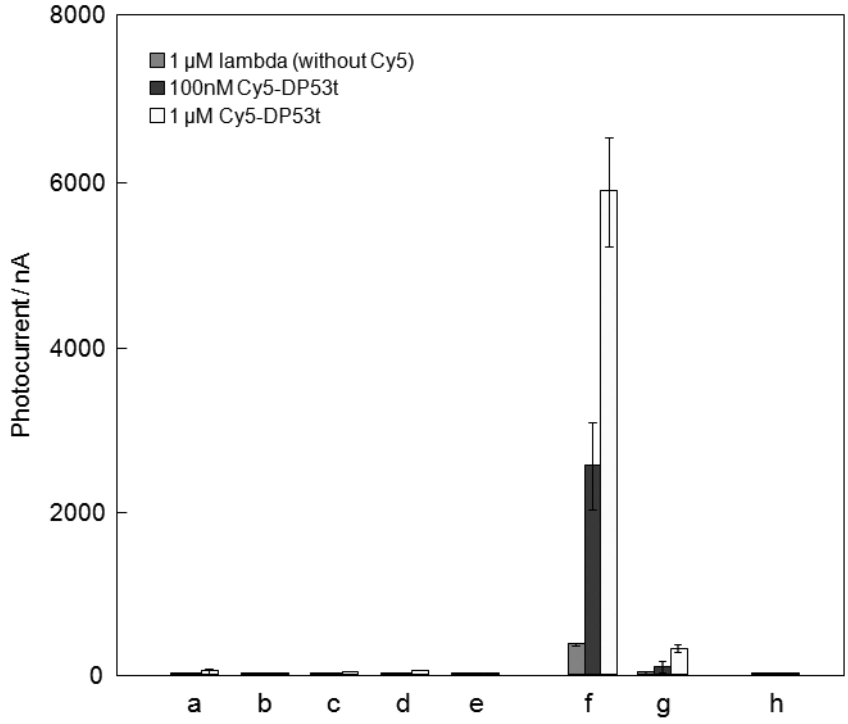


**Fig. S5** Photocurrents generated from Cy5 attached to DNA (DP53t) molecules exited by 120 mW lights through a wide range of porous films; $TiO_2$ films (calcined at 400 °C) prepared using (a) F127 alone, (b-e) F127 with 0.5, 1.0, 1.5 and 2.0 mL of 100 nm PS beads solution, those prepared using PS-*b*-PEO, followed by calcination at (f) 400 °C and (g) 250 °C, and (h) bare FTO substrate.