Supporting Information

Optoelectronic Synaptic Transistor with Efficient Dual Modulation by Light Illumination

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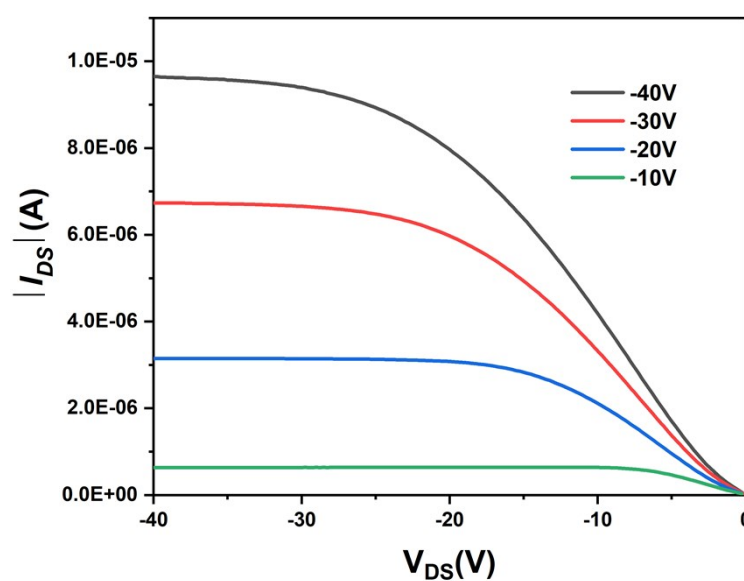E-mail: gxchen@fzu.edu.cn; hpchen@fzu.edu.cn

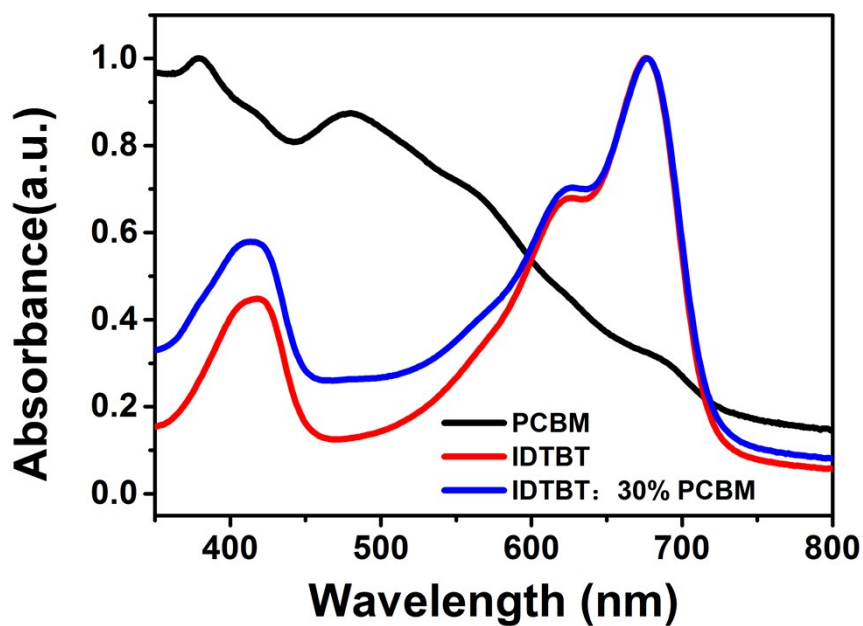**Fig. S1** Output curves of the transistor based on p-n bulk heterojunction blends.

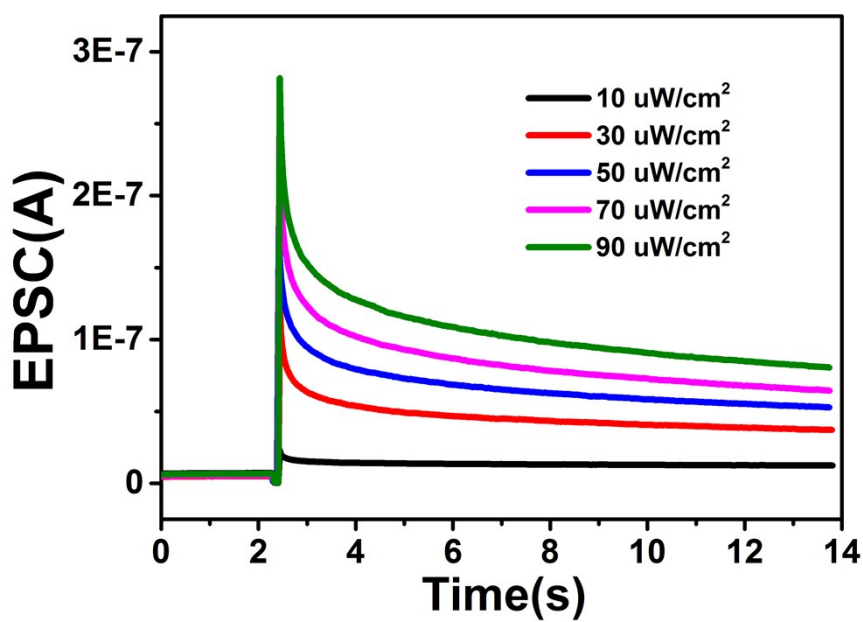**Fig. S2** Absorption spectra of pristine PCBM, pristine IDTBT, and IDTBT blending with 30% PCBM.

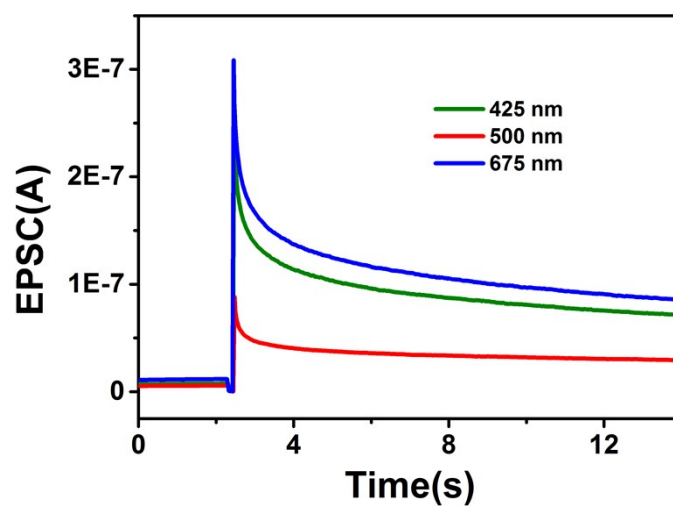**Fig. S3** EPSC generated with different light intensity and the same voltage pulse (10 V, 150 ms).

Fig. S4 EPSC generated with different light wavelength and the same voltage pulse (15 V, 150 ms).
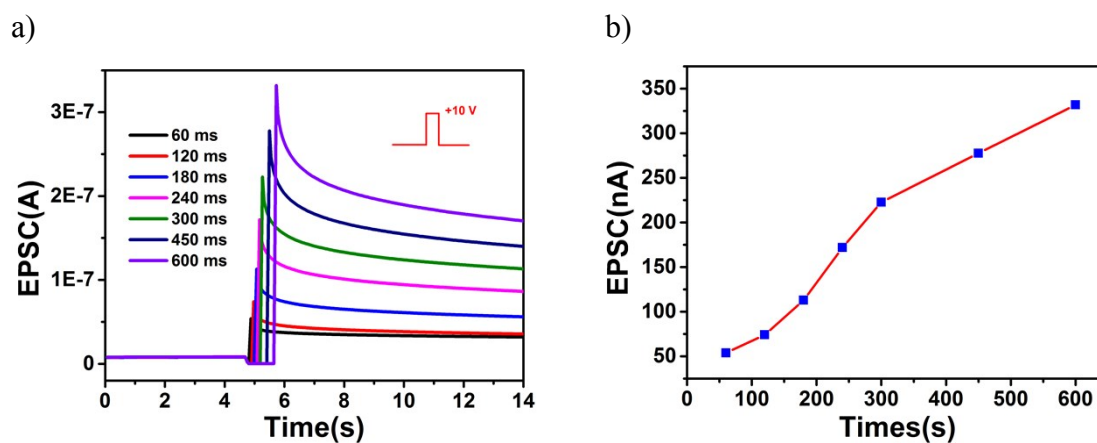
a)

b)

Fig. S5 a) EPSC triggered by gate voltages pulses (V_G=10 V) with different pulse duration times (60, 120, 180, 240, 300, 450 and 600 ms). b) Pulse duration dependent of EPSC change.
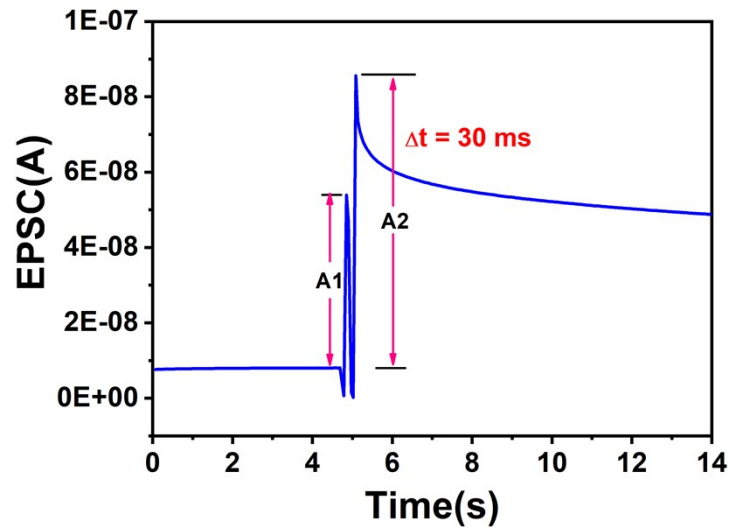
Fig. S6 The EPSC triggered by pair of positive input spikes (10 V) with a time interval 30 ms.
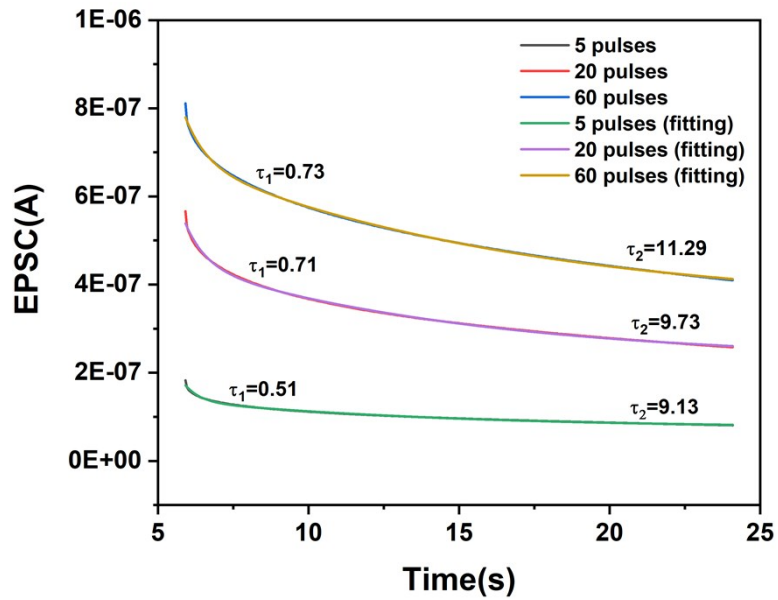

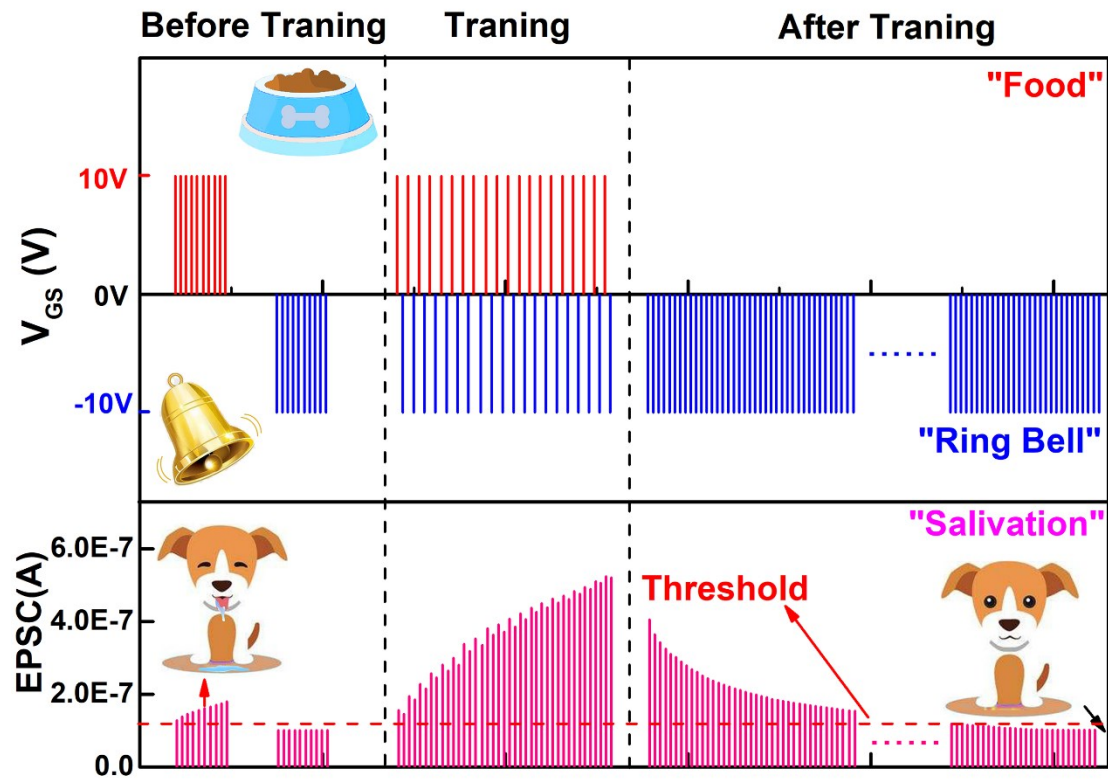**Fig. S7** EPSC curves triggered by different pulses fitted by double-exponential function.

Fig. S8 Schematic diagram of the concept of Pavlov's dog experiment for associative memory.
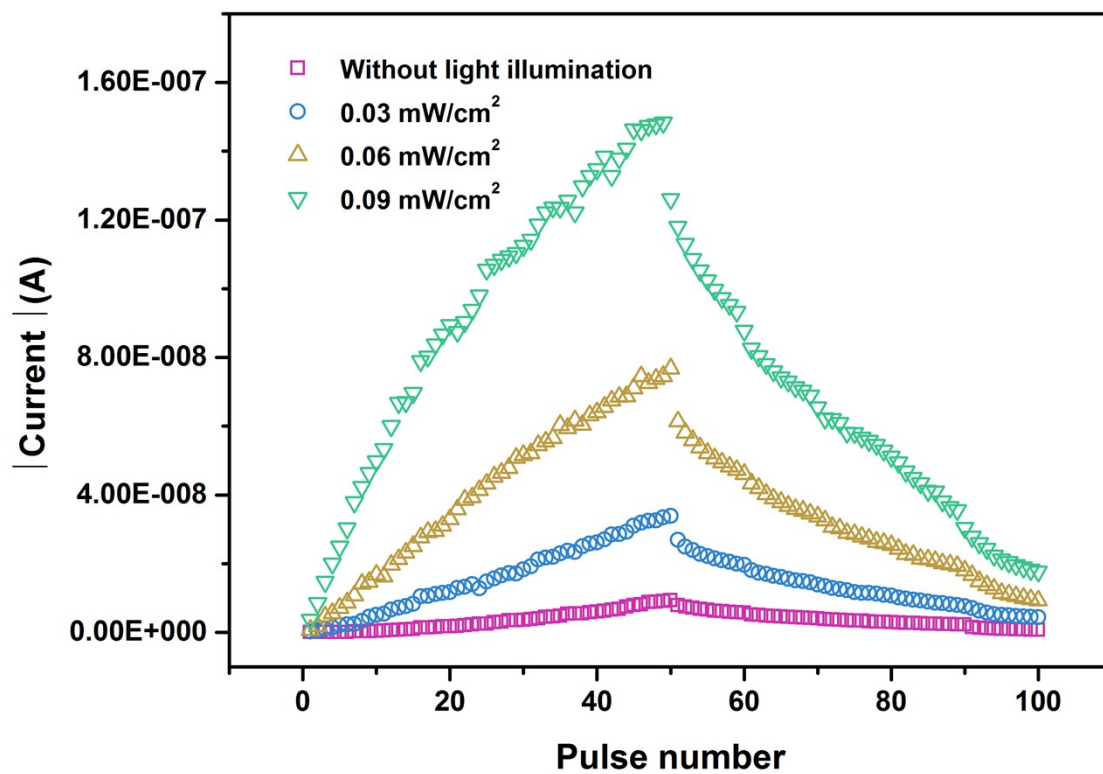
Fig. S9 Plots of the PSC as a function of the number of electrical pulses while consecutively applying a series of positive pulses and negative pulse in the presence of light illumination with different light intensity and absence of light illumination.