- Electronic Supplementary Material (ESI) -

Semiconducting Polymer Dots as Broadband Saturable Absorbers for Q-switched Fiber Lasers

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Supplementary Figures

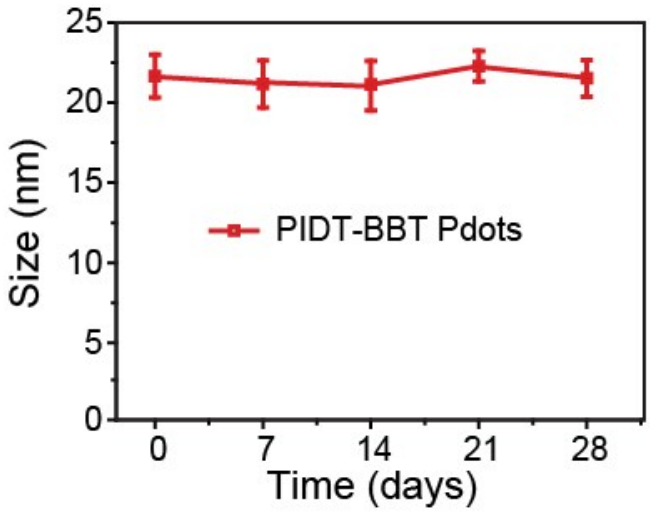

Fig.S1 The hydrodynamic diameters of PIDT-BBT Pdots as a function of storage time.

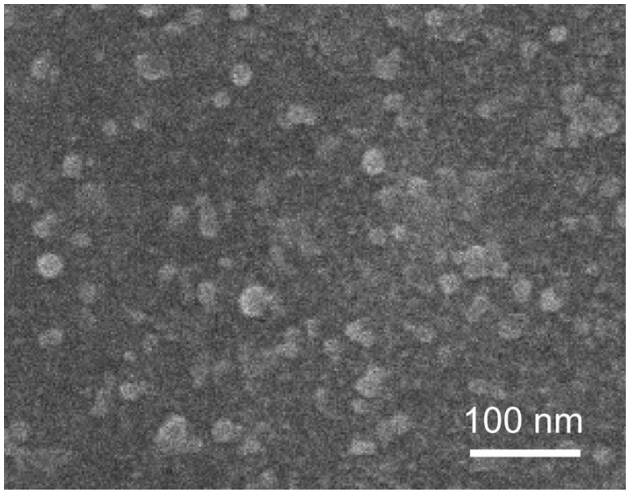

Fig. S2 The SEM image of the Pdots.

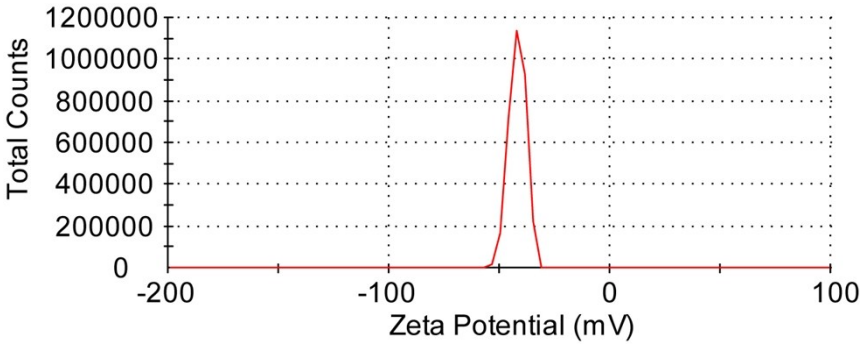

Fig. S3 Zeta-potential of the Pdots.

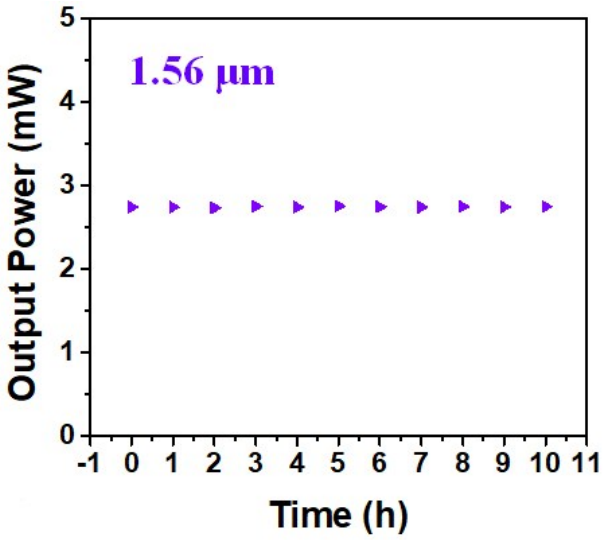

Fig. S4. Output power of the Q-switched lasers at 1.56 μm for the pump power of 118 mW at 1 h interval.

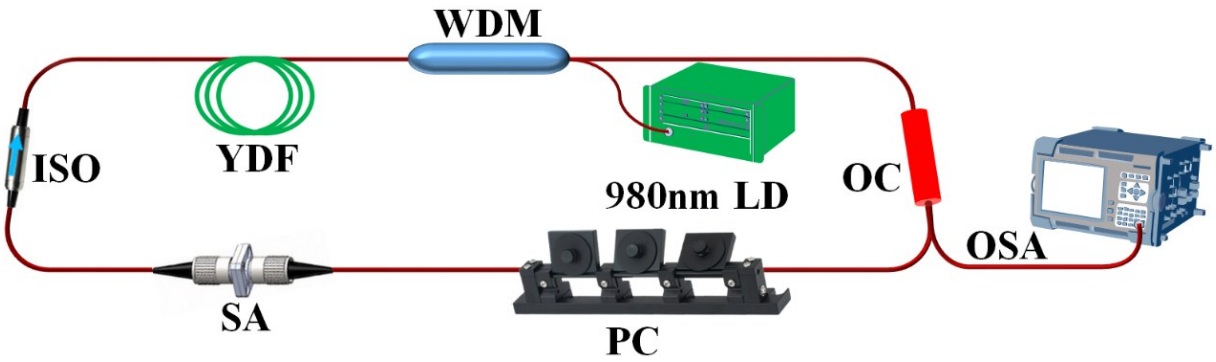

Fig. S5 Experimental setup of the ytterbium-doped fiber laser ring cavity.

The pump light was a 980nm laser diode (LD), which would be launched into the cavity through a 980/1060 nm wavelength-division multiplexing (WDM) coupler. A 20cm-long ytterbium-doped fiber (YDF) was utilized as the gain medium. An isolator (ISO) was added to avoid any harmful feedbacks. A polarization controller (PC) was put in the cavity for the optimum polarization state. The 10 dB optical coupler (OC) was adopted to output 10% of the laser and the rest continued propagating in the cavity. The Pdots-SA film was integrated between the fiber connectors. The output end of the 10 dB OC was connected to an optical spectrum analyzer (OSA) to present the laser spectrum.

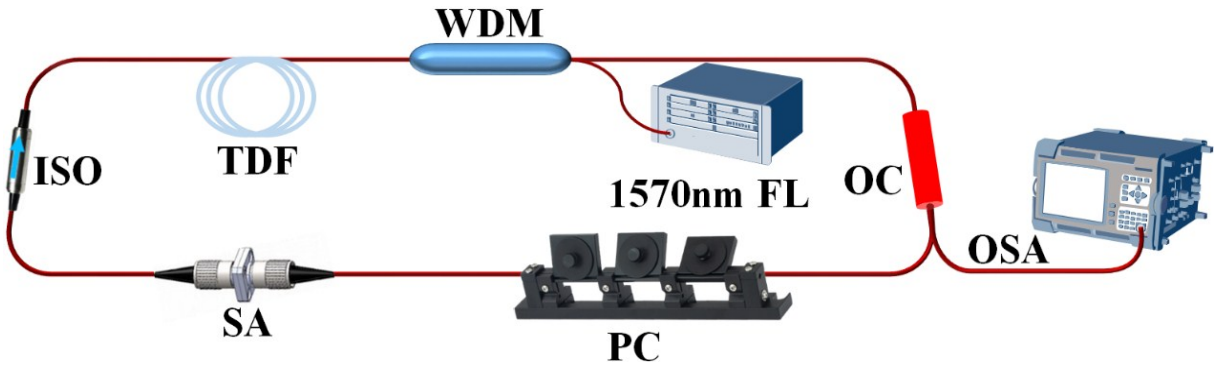

Fig. S6 Experimental setup of the thulium-doped fiber laser ring cavity.

The pump light was a 1570 nm fiber laser (FL), which would be launched into the cavity through a 1550/2000 nm WDM coupler. A 20cm-long thulium-doped fiber (TDF) was utilized as the gain medium. An ISO was added to avoid any harmful feedbacks. A PC was put in the cavity for the optimum polarization state. The 10 dB OC was adopted to output 10% of the laser and the rest continued propagating in the cavity. The Pdots-SA film was integrated between the fiber connectors. The output end of the 10 dB OC was connected to an OSA to present the laser spectrum.

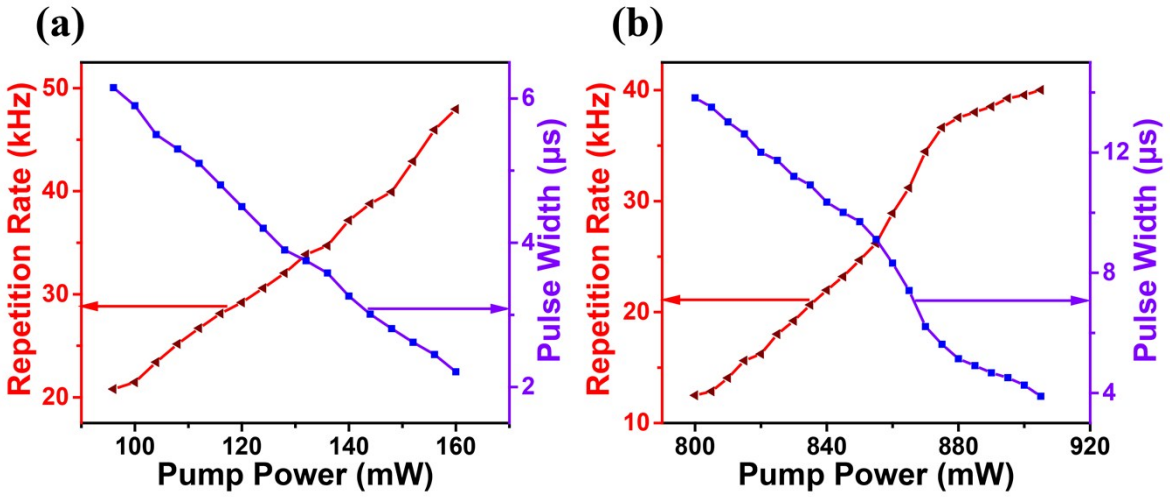

Fig. S7 (a, b) Pulse width (brown) and repetition rate (red) versus incident pump power, of Q-switched YDFL (a) and TDFL (b), respectively.

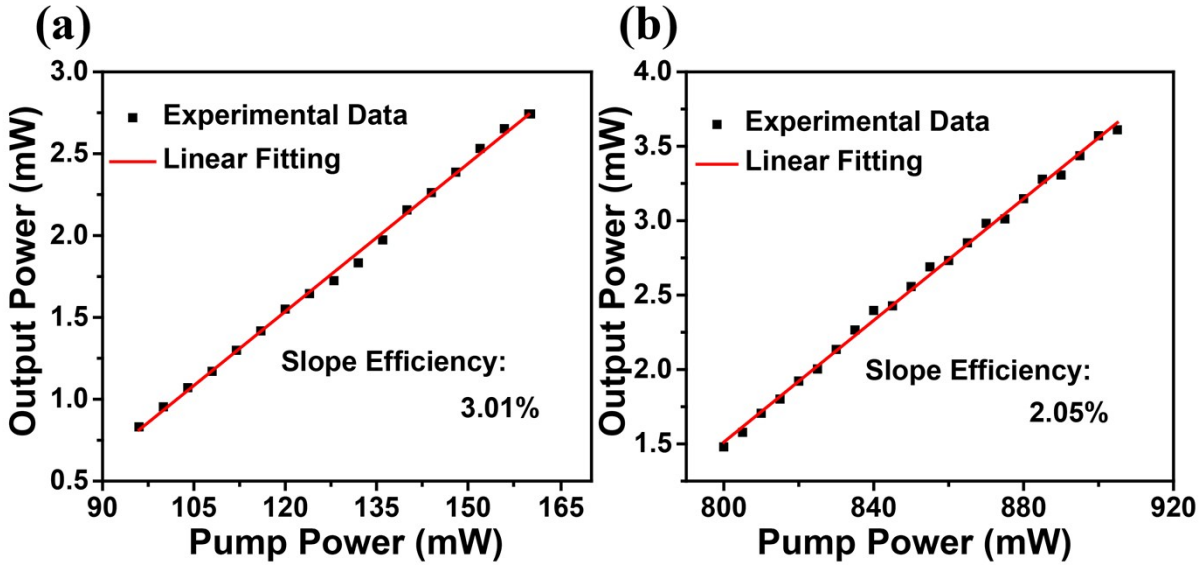

Fig. S8 (a) Output power of the Q-switched Yb-doped fiber laser as a function of the pump power. (b) Output power of the Q-switched Tm-doped fiber laser as a function of the pump power.

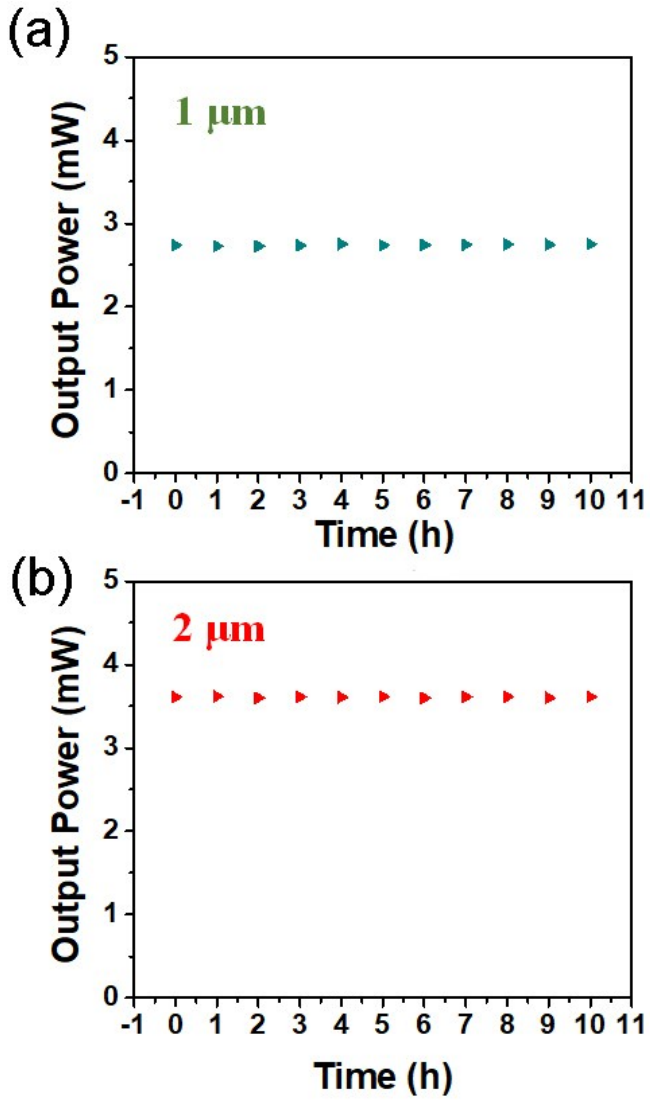

Fig. S9. Output power of the Q-switched lasers at 1μm (a) and 2 μm (b) for the pump power of 160 and 905 mW at 1 h interval, respectively.