## **Supporting Information**

All-inorganic Perovskite Quantum Dots/TiO<sub>2</sub> Inverse Opal Electrode

Platform: A Stable and Efficient Photoelectrochemical Sensing for

**Dopamine under Visible Irradiation** 

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Figure S1.Energy-dispersive X-ray (EDX) analysis of TiO<sub>2</sub>/CsPbBr<sub>1.5</sub>I<sub>1.5</sub> composite film.



Figure S2. The emission spectra of  $CsPbBr_{1.5}I_{1.5}$  QDs.



Figure S3. Transmittance spectra of the different PSB locations of TiO<sub>2</sub> IOPCs.



Figure S4. Photocurrent response as a function of excitation wavelength measured in PBS (pH 7.4)



**Figure S5**. The absorption spectra (a) and absorption variation (b) of DA after different wavelength light excited for 1 h.



**Figure S6.** SEM images of the  $TiO_2/CsPbBr_{1.5}I_{1.5}$  composite film and the corresponding cross-section view with different  $CsPbBr_{1.5}I_{1.5}$  QDs loadings, (a) 0.5 mg/mL, (b)1 mg/mL, (c) 2 mg/mL, (d)3 mg/mL.

Finite-difference time-domain simulations.



Figure S7. (a) SEM images of vertical-section view of the  $TiO_2$  IOPCs. (b) Simulated electric field intensity distribution of vertical-section view of  $TiO_2$  IOPCs under 600 nm light excitation with the PBS locations at 604 nm. (c-e) Simulated electric field intensity distribution of cross-section view of  $TiO_2$  IOPCs with different thickness from top to bottom under 600 nm light excitation with the PSB locations at 604 nm.

The calculation of electric field distribution was calculated using commercial software with a frequency domain solver based on the three-dimensional FDTD method. The FDTD method is an explicit time marching algorithm used to solve Maxwell's curl equations on a discretized spatial grid. The absorbing boundary conditions of perfectly matched layer were obtained in different directions. Further, an electric pulse was launched into the boundary to simulate the distribution of electric field. The bulk ratios of TiO<sub>2</sub> films in the mesh range (2000 nm ×2000 nm ×2000 nm) were fixed when calculating the electric field distribution. The averaged electric field enhancement factors were obtained by calculating the average value of the electric field intensity enhancement in the mesh range.



Figure S8. Photocurrent responses of the  $TiO_2/CsPbBr_{1.5}I_{1.5}/Nafion$  electrode in the PBS solution (0.1 M, pH=7.4) and in the with PBS solution containing 100  $\mu$ M DA.