Supporting Information

A Novel Photoelectrochemical Sensor for the Detection of α-Fetoprotein Based on Mesoporous TiO$_2$-CdS QDs Composite Film

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Fig. S1. The SEM of mesoporous TiO$_2$ film and CdS/TiO$_2$/ITO film

Fig. S2. Photocurrent responses of (a) CdS/TiO$_2$/ITO and (b) TiO$_2$/ITO in 0.01 M PBS suffer solution (pH=7.4) containing 0.1 M ascorbic acid solution as electron donor with a light excitation at 400 nm.
Fig. S3. Wavelengths scanning of TiO$_2$/ITO electrode in 0.01 M PBS suffer solution (pH=7.4) containing 0.1 M ascorbic acid solution as electron donor.

Fig. S4. Wavelengths scanning of CdS/TiO$_2$/ITO electrode in 0.01 M PBS suffer solution (pH=7.4) containing 0.1 M ascorbic acid solution as electron donor.
Fig. S5. Photocurrent change for CdS/TiO$_2$/ITO with different deposition time of CdS in 0.01 M PBS suffer solution (pH=7.4) containing 0.1 M ascorbic acid solution as electron donor with a light excitation at 400 nm.

Fig. S6. Photocurrent change for different concentrations of anti-AFP on CdS/TiO$_2$/ITO in 0.01 M PBS suffer solution (pH=7.4) containing 0.1 M ascorbic acid solution as electron donor with a light excitation at 400 nm.
Table S1. The recovery studies of AFP

<table>
<thead>
<tr>
<th>sample</th>
<th>original (ng/mL)</th>
<th>added (ng/mL)</th>
<th>found (ng/mL)</th>
<th>recoveries</th>
<th>average recoveries</th>
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<td>1</td>
<td>0.474</td>
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<td>1.42</td>
<td>94.6%</td>
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</tr>
<tr>
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<td>1.00</td>
<td>2.11</td>
<td>109%</td>
<td>103%</td>
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<tr>
<td>3</td>
<td>5.15</td>
<td>1.00</td>
<td>6.20</td>
<td>105%</td>
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