Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

SUPPLEMENTARY FIGURES/TABLES

Table S1: Artificial seawater (ASN III) medium

NaCl	25.0 g L^{-1}
$MgSO_4 \cdot 7H_2O$	3.5 g L^{-1}
$MgCl_2 \cdot 6H_2O$	2.0 g L^{-1}
$NaNO_3$	0.75 g L^{-1}
$K_2HPO_4 \cdot 3H_2O$	0.75 g L^{-1}
$CaCl_2 \cdot 2H_2O$	0.5 g L^{-1}
KCl	0.5 g L^{-1}
$NaCO_3$	0.02 g L^{-1}
Citric acid	3.0 mg L^{-1}
Ferric ammonium citrate	3.0 mg L^{-1}
EDTA	0.5 mg L^{-1}
Trace element solution	1 mL L^{-1}

pH adjusted to 7.4.

Trace elements

H_3BO_3	2.86 g L^{-1}
$MnCl_2 \cdot 4H_2O$	1.81 gL^{-1}
$ZnSO_4 \cdot 7H_2O$	0.222 gL^{-1}
$NaMoO_4 \cdot 2H_2O$	0.39 gL^{-1}
$CuSO_4 \cdot 5H_2O$	0.079 g L^{-1}
$Co(NO_3)_2 \cdot 6H_2O$	49.4 mg L^{-1}

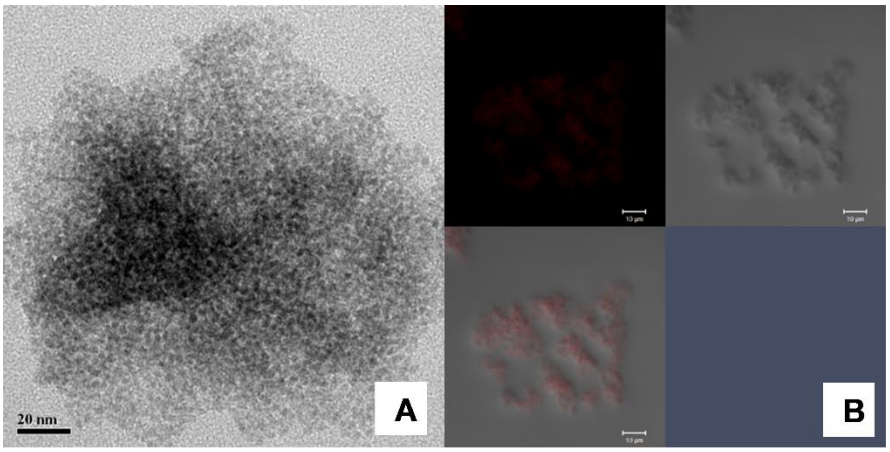

Fig. S1 (A) TEM image of the CdTe QD. (B)The presence of QD in SF/QD matrix examined under CLSM with excitation at $\lambda_{644\ nm}$ and red emission filter.

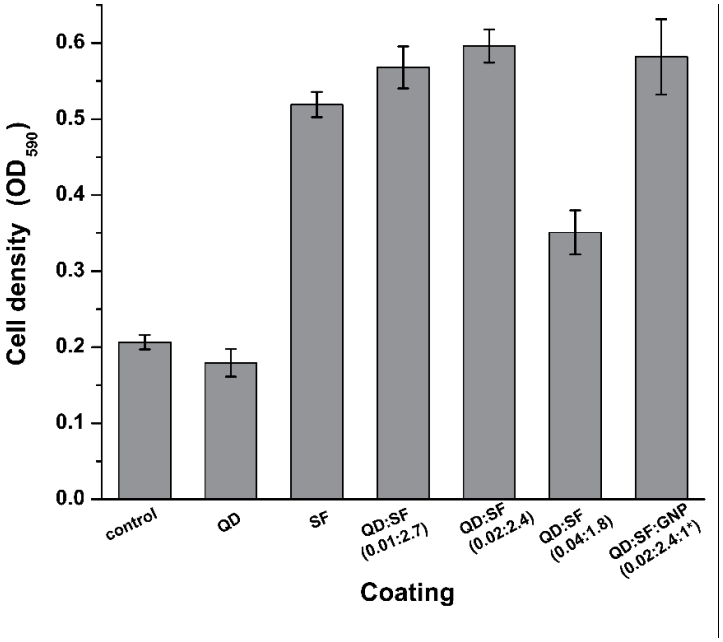

Fig. S2 Cell density assay of *Synechococcus* sp. on solid support coated with different concentrations of QD in SF film. *Concentration of GNP with respect to SF.

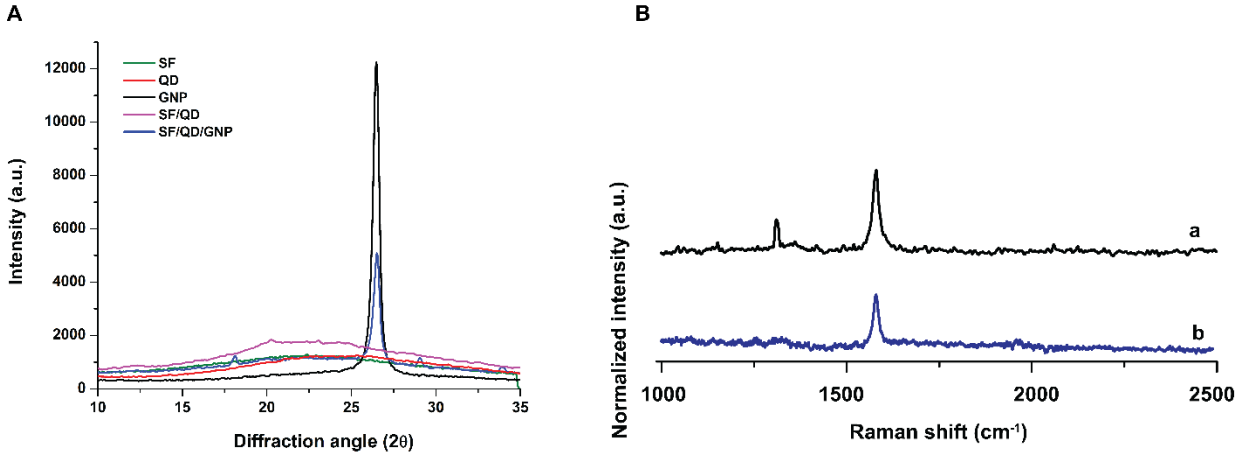

Fig. S3 (A) XRD patterns of the nanocomposite films. (B) Normalized Raman spectra of the films (a) GNP and (b) SF/QD/GNP.

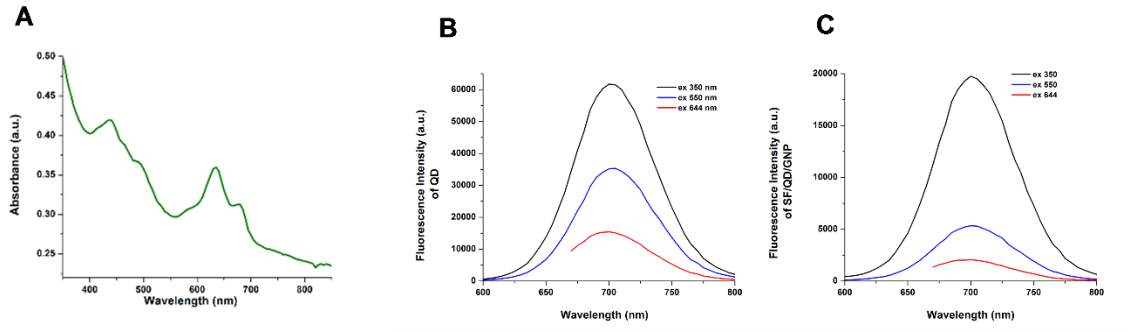

Fig. S4 (A) Absorbance spectra of *Synechococcus* sp. and fluorescence emission spectra at different excitation wavelength of (B) QD and (C) SF/QD/GNP solutions.

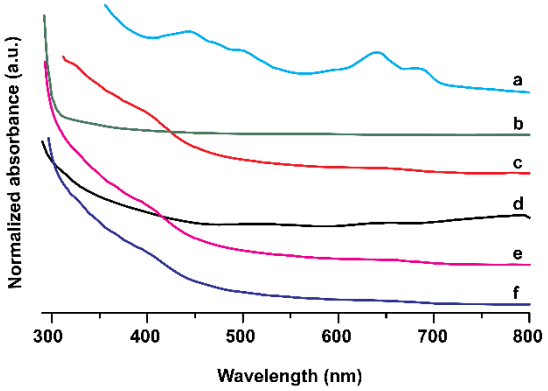

Fig. S5 Absorbance spectra of (a) *Synechococcus* sp. (b) SF (c) QD (d) GNP (e) SF/QD and (f) SF/QD/GNP.

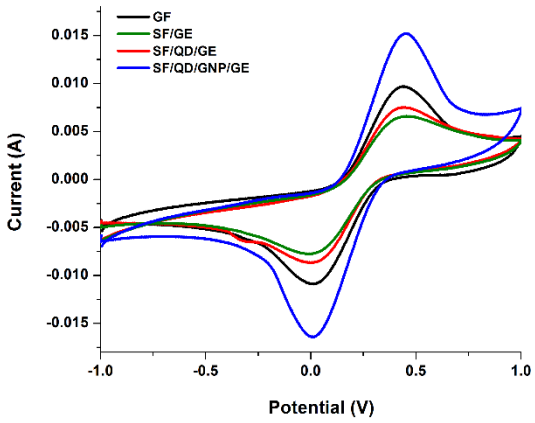

Fig. S6 CV profiles (100 mV s^{-1}) of bare and different modified anodes in 5mMK_3FeCN_6 and 0.1 M KCl solution in PBS buffer (pH 7).

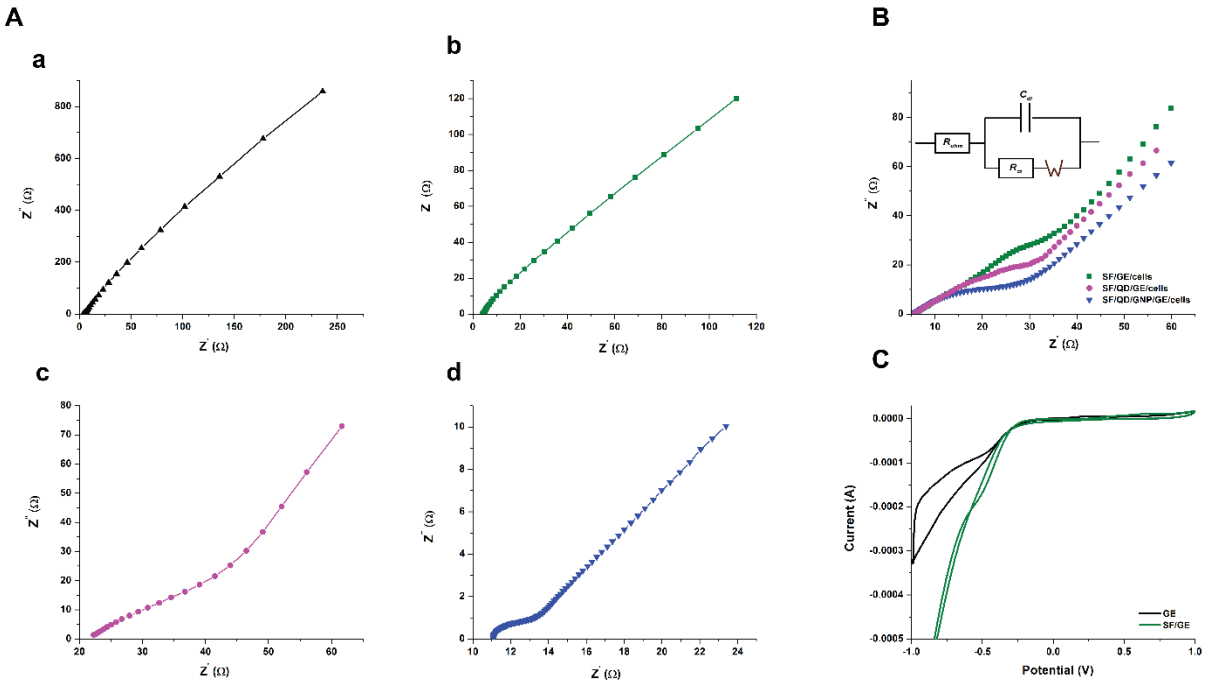

Fig. S7 (A) Nyquist plots of anodes a) blank GE and with different modifications, (b) SF/GE, (c) SF/QD/GE and (d) SF/QD/GNP/GE. (B) Impedance profile of different anodes with bacterial cells after PMFC run (inset Randles circuit). (C) CV of blank GE and SF/GE in PBS buffer (pH 7) at a scan rate of 1 mV/s.