Supplementary information

Efficiency of non-optimized cell assembly prepared and investigated in this paper are comparable with efficiencies of many other DSS-cells sensitized with natural pigments with conversion efficiency somewhere between 0,013 and 0,50 %. Performances of cells 1 and 2 are depicted in Fig S1, while performance of the most efficient device, Cell 3 is presented in Fig. 3.

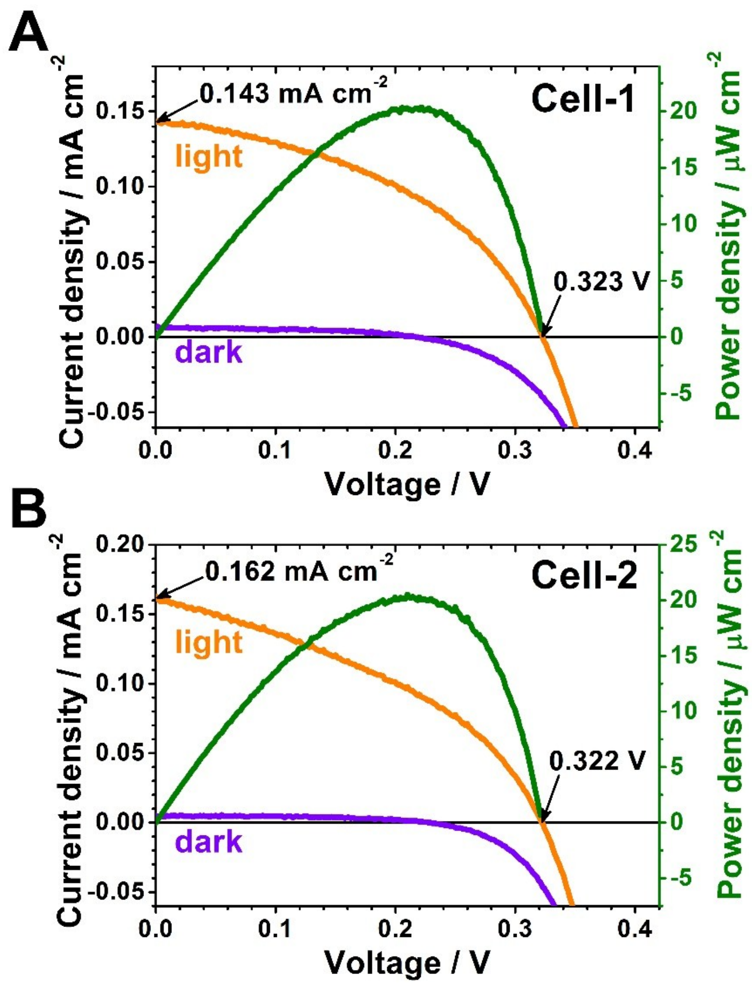

Fig. S1. J–V and power density vs. voltage curves under illumination and J–V curve in the dark for: (A) Cell-1 and (B) Cell-2.

Operating parameters of each of the three fabricated cells (short-circuit current density – J_{SC}, open-circuit voltage – V_{OC}, fill factor – FF and photo-to-current efficiency – η) that were assessed from the curves are listed in Table S1 and their mean values are given in the paper, in Table 1.

Cell	**J_{SC} / μA cm^{-2}**	**V_{OC} / V**	**FF / %**	**η / %**
1	143	0.323	43.9	0.0203
2	162	0.322	39.1	0.0204
3	227	0.327	44.1	0.0327

Table S1. Operating photovoltaic parameters for three investigated solar cells with a hypericin-sensitized TiO_2 photoanode.

Three new cells without hypericin are inspected. The mean values of currents J_{SC} for three cells with and three cells without hypericin were compared. Representative current density–voltage characteristics of the hypericin and reference blank solar cell were presented in Fig. S2. The results confirm photoactivity of hypericin, since cells with pigment showed 49% higher J_{SC}.

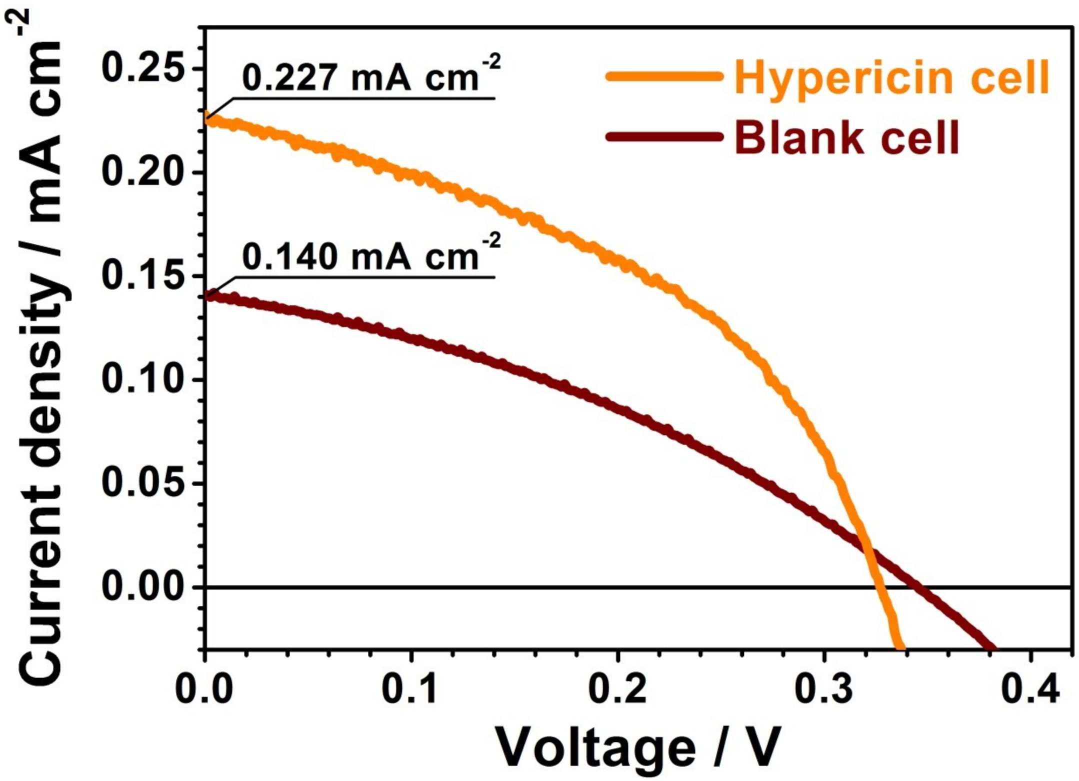

Fig. S2. Representative current density–voltage characteristics of the hypericin and reference blank solar cell under 100 mW cm^{-2} of simulated AM 1.5 illumination.

Bode magnitude and phase plots for the cells 1 and 2 are given in Fig. S3, while the same plot for the cell 3 is given in the paper.

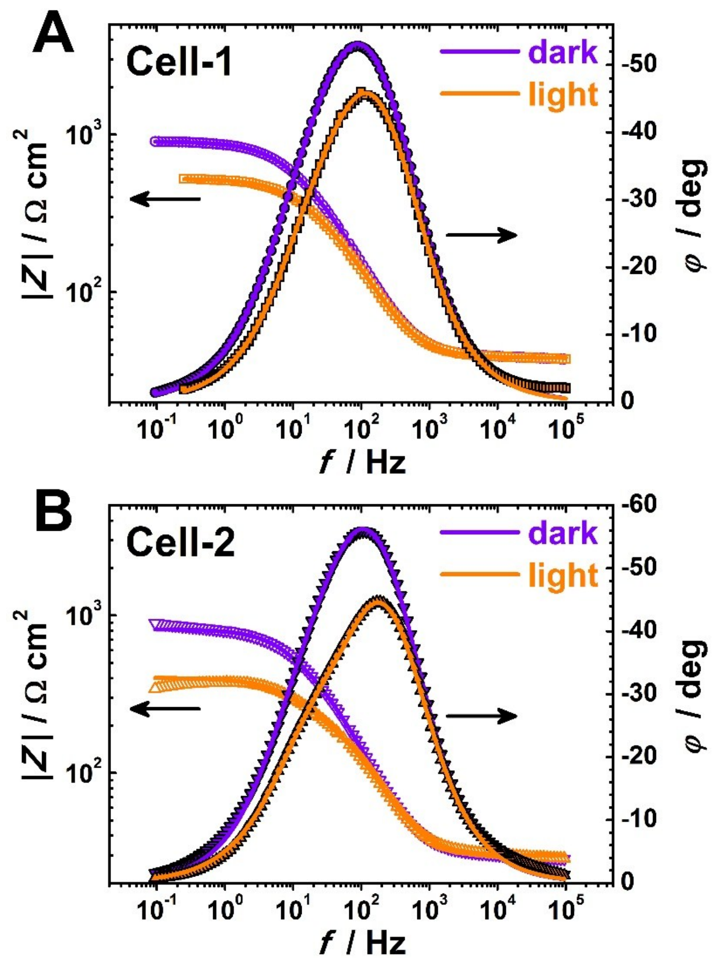

Fig. S3. Bode magnitude and phase plots recorded at 0.32 V (open circuit conditions) in the dark and under illumination for: (A) Cell-1 and (B) Cell-2.

All Nyquist curves, for cells 1-3, acquired under both experimental conditions (dark and light) are composed of two partially overlapped semicircles, which correspond to the two characteristic peaks observed at about 200 and 10 Hz in the Bode phase plots, and are presented in Fig S4.

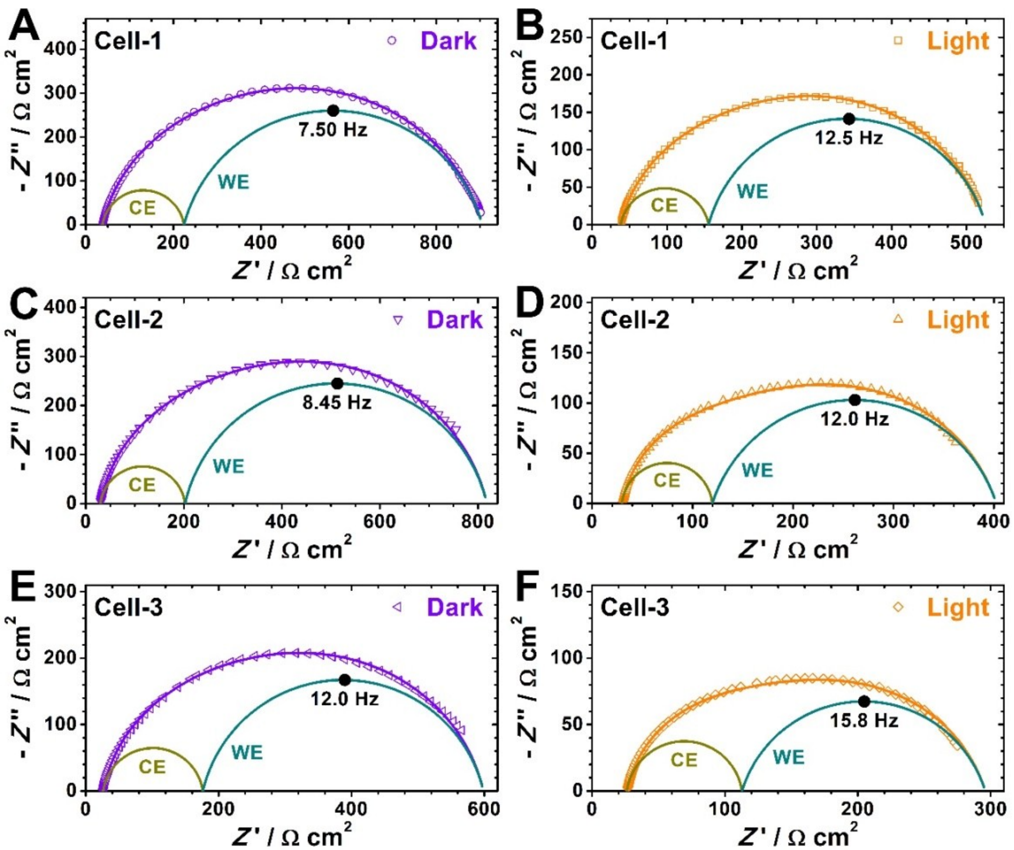

Fig. S4. Nyquist plots recorded at 0.32 V (open circuit conditions) in the dark and under illumination for: Cell-1 (A and B), Cell-2 (C and D) and Cell-3 (E and F). Individual semicircles related to charge transfer at the working (WE) and counter electrode (CE) are also included. Maxima of the WE semicircles (●) and the corresponding characteristic frequencies are marked in the figure. Experimental points are represented as symbols and simulated curves as solid lines.

In Table S2 are given circuit parameters extracted from the fitting procedure, whereas mean R_{ct} values for the three cells are included in Table 1.

Condition	R_s/Ω cm^2	R_{ct}/Ω cm^2	Y_{int}/μS s$^\alpha$ cm^{-2}	α_{int}	R_{ce}/Ω cm^2	Y_{ce}/μS s$^\alpha$ cm^{-2}	α_{ce}	f_{max}/Hz	τ_{el}/ms
Cell-1									
Light	38.1	370	70.6	0.832	118	51.9	0.879	12.5	12.7
Dark	38.1	680	57.5	0.831	186	52.1	0.890	7.50	21.2
Cell-2									
Light	29.7	283	109	0.802	90.0	31.9	0.930	12.0	13.3
Dark	29.7	616	54.8	0.856	173	42.2	0.918	8.45	18.8
Cell-3									
Light	26.1	183	131	0.809	86.7	30.7	0.908	15.8	10.1
Dark	26.2	422	60.0	0.853	150	39.2	0.906	12.0	13.3

Table S2. Circuit parameters for three investigated cells under different experimental conditions (dark and light) obtained by fitting the impedance spectra to the model shown in Fig. 4C. Note that the impedance of a constant phase element (CPE) is given as $Z_{CPE} = 1/(Y\cdot(i\omega)^\alpha)$*, where Y and α are CPE parameters.*