High-performance self-powered broadband photodetector
based on CH$_3$NH$_3$PbI$_3$ Perovskite/ZnO nanorod arrays heterostructure

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Figure S1 XRD pattern of the pristine FTO substrate.
Figure S2 The absorption spectra of ZnO nanorods and CH$_3$NH$_3$PbI$_3$ on ZnO nanorods.
Figure S3 High-angle annular dark-field (HAADF) scanning transmission electron microscopy (STEM) images and EDXS analysis. (a) Low magnification HAADF-STEM image of ZnO-nanorods. (b) Atomic-column resolved HAADF image of a ZnO nanorod of the highlighted area in Fig. S2 (a). An atomic structure model of the hexagonal phase of ZnO along [010] projection is superimposed on the HAADF image. (c) STEM-EDXS spectrum of ZnO nanorods in Fig. S2 (a), in which Pb-M and I-L lines are clearly visible.
Figure S4 Photocurrent rise and decay of the device measured at a bias of 0 V.
Figure S5 Photoelectric response curves of the original value (a) and after three months of illumination (b).