

## Low-temperature synthesis of photoconducting CdTe nanotetrapods

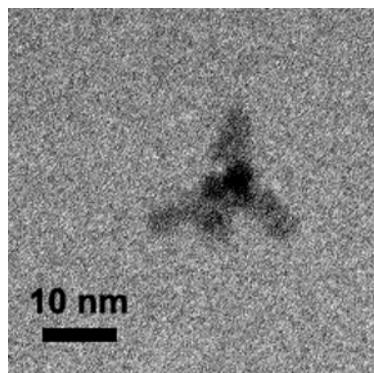
Abhilash Sugunan,<sup>a</sup> S. Hassan M. Jafri,<sup>b</sup> Jian Qin,<sup>a</sup> Tobias Blom,<sup>b</sup> Muhammet S. Toprak,<sup>a</sup> Klaus Leifer<sup>\*b</sup> and Mamoun Muhammed<sup>\*a</sup>

<sup>a</sup>*Division of Functional Materials, Royal Institute of Technology (KTH), Stockholm, 16440, Sweden. E-mail: mamoun@kth.se*

<sup>b</sup>*Division of Electron Microscopy and Nanoengineering, Ångström Laboratory, Uppsala University, Uppsala, 75121, Sweden. E-mail: Klaus.Leifer@Angstrom.uu.se*

### Supplementary Information

**Figure S1**

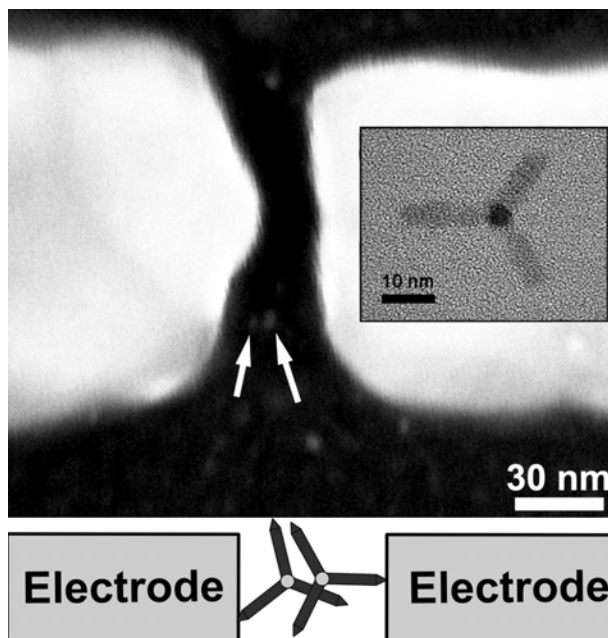


**Figure S1.** TEM micrograph of a single CdTe tetrapod synthesized by rapid injection of Cd and Te precursors into 1-octadecene at 180 °C, followed immediately by slow cooling to room temperature.

### SEM characterization of the nano-gap electrode

Although we used CdTe NTPs with 15 nm long and ~5 nm diameter arms (inset, Figure S2), and this size is within the resolving capacity of our scanning electron microscope (SEM), we could not clearly resolve images of CdTe NTP between the electrodes due to accumulation of organic residue on the electrodes which obscured the nanocrystals. Therefore we cleaned the samples using oxygen plasma. In the nano-gap electrodes containing no trapped nanoparticles, the electrode gap is free of any nanoparticle-like contrast. Here, SEM images taken after oxygen plasma cleaning showed features with ~5 nm size, which can be attributed to the tips of the

vertical arms of the CdTe NTPs seen between the 120 nm high gold nano-gap electrodes (Figure S2).



**Figure S2.** SEM image of the ‘nano-gap’ with CdTe nanotetrapods (NTP), after cleaning with oxygen plasma. The scheme below shows a possible representation of the trapped NTPs. Features with ~5 nm dimension are visible in the gap (marked with the arrow) which could be the vertical arm of tetrapods. Inset; TEM image of a single CdTe NTP.

**Table S1.** List of average resistance values ( $R$ ) obtained from I-V measurements performed under dark and illuminated conditions, for 1 V and 2.5 V. Average resistance is calculated from the resistances obtained for the range of  $\pm 0.1$  V of the chosen voltage.

	1 V		2.5 V	
	Dark $R$ ( $\Omega$ )	Light $R$ ( $\Omega$ )	Dark $R$ ( $\Omega$ )	Light $R$ ( $\Omega$ )
<b>Device 1</b>	$1.911 \times 10^{15}$	$4.542 \times 10^{13}$	$6.827 \times 10^{14}$	$3.343 \times 10^{12}$
<b>Device 2</b>	$1.838 \times 10^{15}$	$5.503 \times 10^{14}$	$3.811 \times 10^{15}$	$1.596 \times 10^{14}$
<b>Device 3</b>	$3.244 \times 10^{15}$	$2.303 \times 10^{14}$	$4.05 \times 10^{14}$	$3.159 \times 10^{13}$