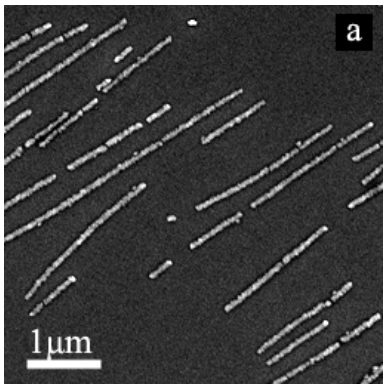
Supporting Information

Proposed cover art image:



A facile and effective PDMS-transfer method is developed to fabricate highly dense and well-aligned CdS nanowires. CdS nanowires are first selectively deposited and confined on DNA temeplate aligned on PDMS sheet, and then are transferred to the silica substrate with low occurrence of parasitic CdS nanoparticles. The width and length of nanowires can be controlled by adjusting incubation time.

Fabrication of Well-aligned and Highly Dense Cadmium Sulfide Nanowires on DNA Scaffolds by PDMS-transfer Method

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In our PDMS-transfer method, very few parasitic CdS nanoparticles are on the substrates. Figure S1 shows a histogram about the number of parasitic nanoparticles on the sbustrates. The data are obtained based on at least ten images of FESEM in every case. From figure S1, very few parasitic nanoparticles can be found on the substrates. For example, in the cases of 72 or 96hr incubation time, the number is only 0.2 and 0.5 particles per μm^2 respectively.

Our PDMS-transfer method has a relatively high yield in the surface of substrates, as shown in Figure S2.

To optimize the molar ratio of DNA to Cd^{2+}, we tried four different ratios as shown in Figure S3. From Figure S3, it could be found clearly that when the molar ratio was below 50:1, the produced CdS nanowires were not dense and thick. However, when the ratio was 200:1, the nanowires agglomerated remarkably. Therefore, we chose the ratio of 100:1 for the fabrication of nanowires in our experiment.

The EDX (Energy dispersive X-ray spectroscopy) spectrum is shown in Figure S4. The result indicates that these nanowires are composed of S and Cd elements. The appearance of P element signal is attributed to DNA embedded in these nanowires. The C and Cu peaks are caused by the carbon coating Cu grid for TEM observation.

Figure S5 shows the mean length of CdS nanowires with different incubation time. Generally speaking, the mean length of the nanowires increases with the incubation time. However, the data can be significantly different if the incubation time is long.

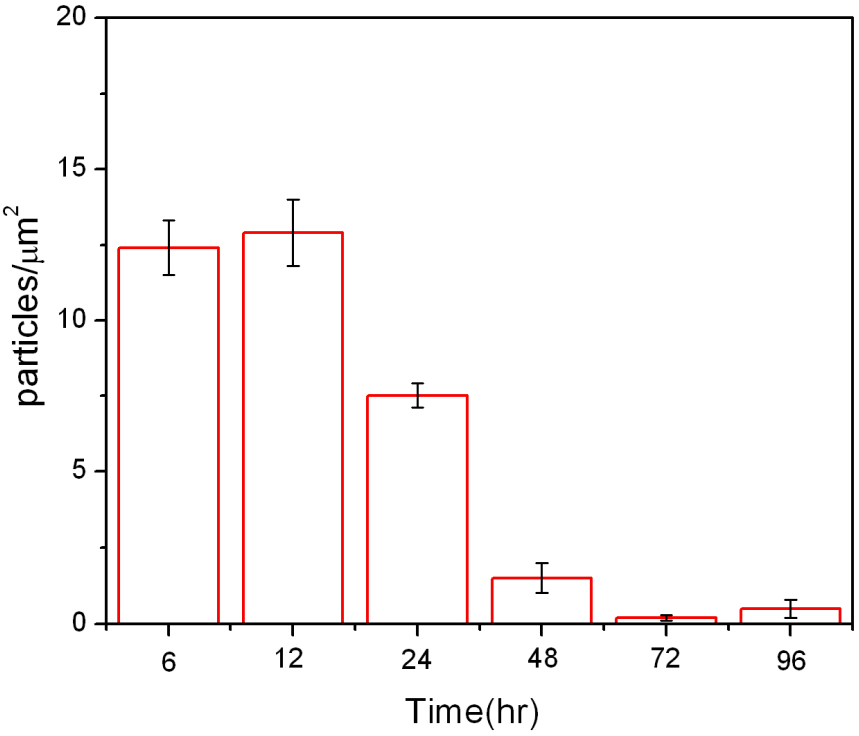

Figure S1. Mean parasitic CdS nanoparticles per μm^2 after 6, 12, 24, 48, 72, 96hr incubation .

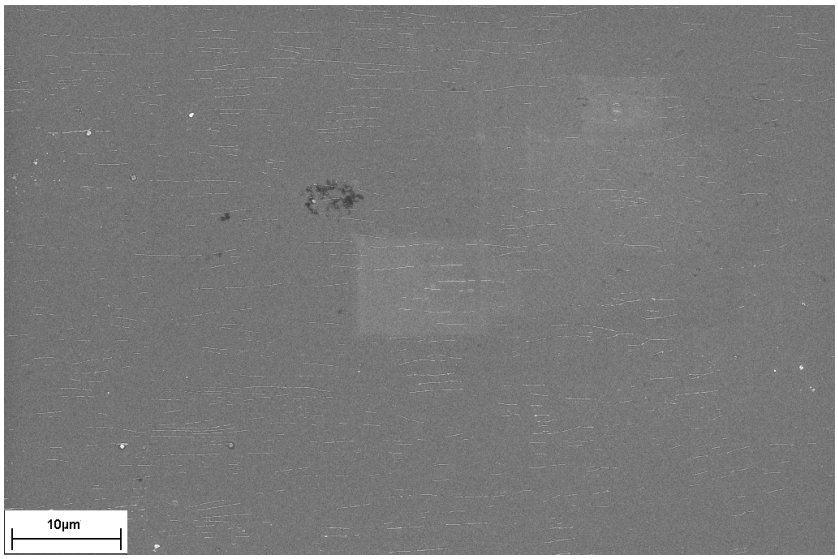

Figure S2. High yield CdS nanowires on relatively large area on silica substrates

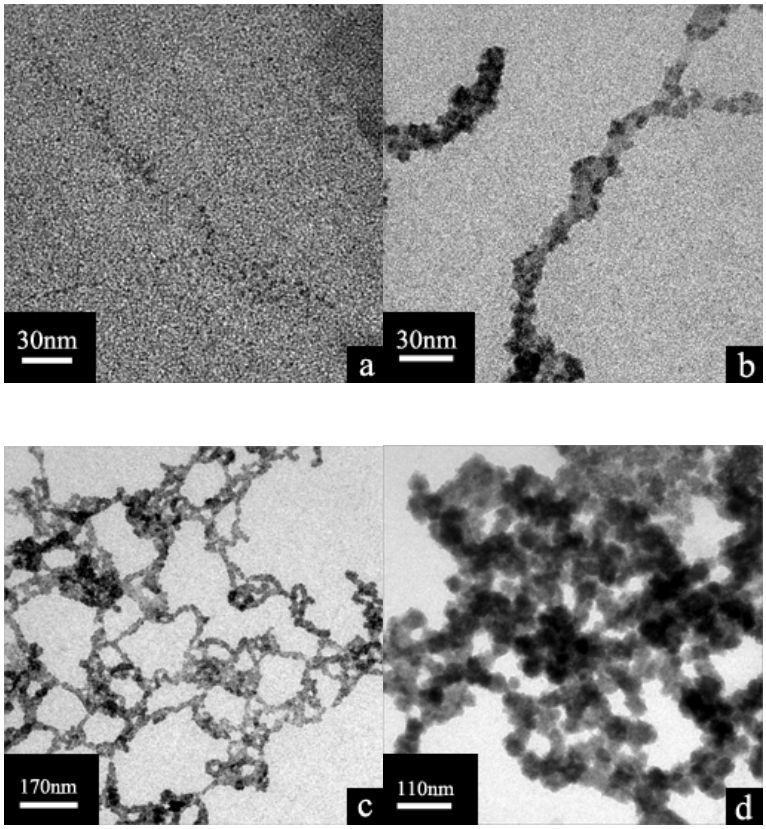

Figure S3. TEM images of CdS nanowires synthesized by solution-suspended DNA method with different molar ratios of Cd^{2+} to DNA base pairs. (a) 10:1 (b) 50:1 (c) 100:1 (d) 200:1

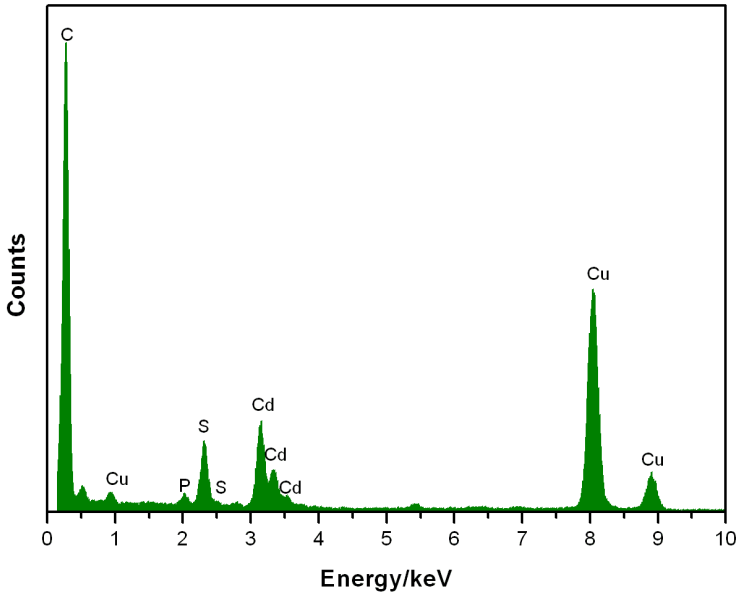

Figure S4. Energy dispersive X-ray spectrum of synthesized CdS nanowires

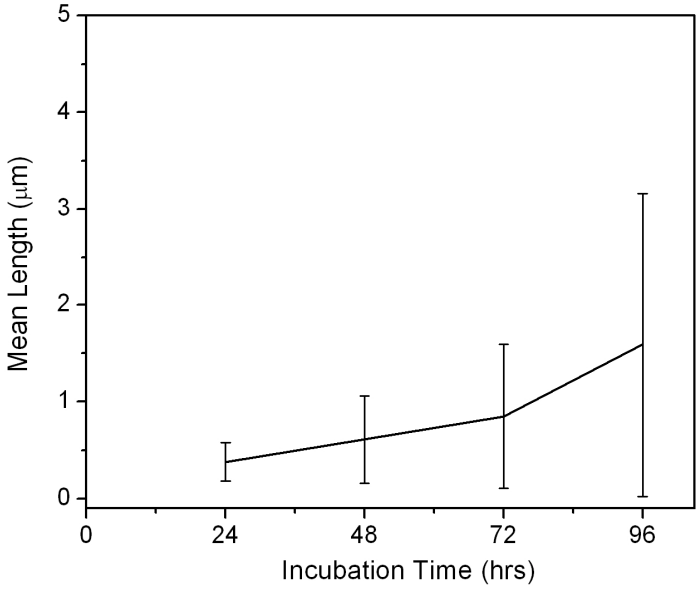

Figure S5. Mean length of CdS nanowires with different incubation time.