

## Supporting Information for

### Ligand-directed rapid formation of ultralong ZnO nanowires by oriented attachment for UV photodetectors

Jing Wang<sup>a, b</sup>, Xian Li<sup>c</sup>, Changjiu Teng<sup>c</sup>, Yi Xia<sup>a</sup>, Jianlong Xu<sup>d</sup>, Dan Xie<sup>c</sup>, Lan Xiang<sup>a□</sup>, Sridhar Komarneni<sup>b\*</sup>

<sup>a</sup> Department of Chemical Engineering, Tsinghua University, Beijing, 100084, China

<sup>b</sup> Materials Research Institute and Department of ecosystem Science and Management, Materials Research Laboratory, The Pennsylvania State University, University Park, PA 16802, USA

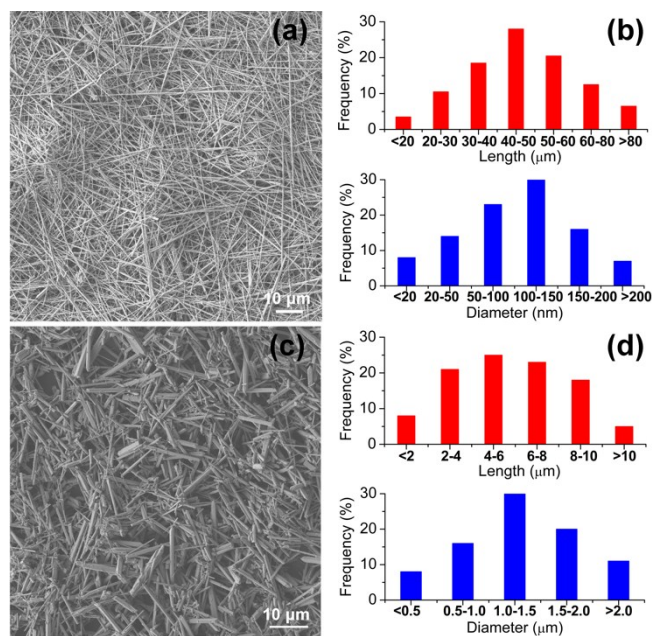
<sup>c</sup> Institute of Microelectronics, Tsinghua University, Beijing, 100084, China

<sup>d</sup> Institute of Functional Nano and Soft Materials (FUNSOM), Jiangsu Key Laboratory for Carbon-based Functional Materials and Devices, Soochow University, Suzhou, Jiangsu 215123, China

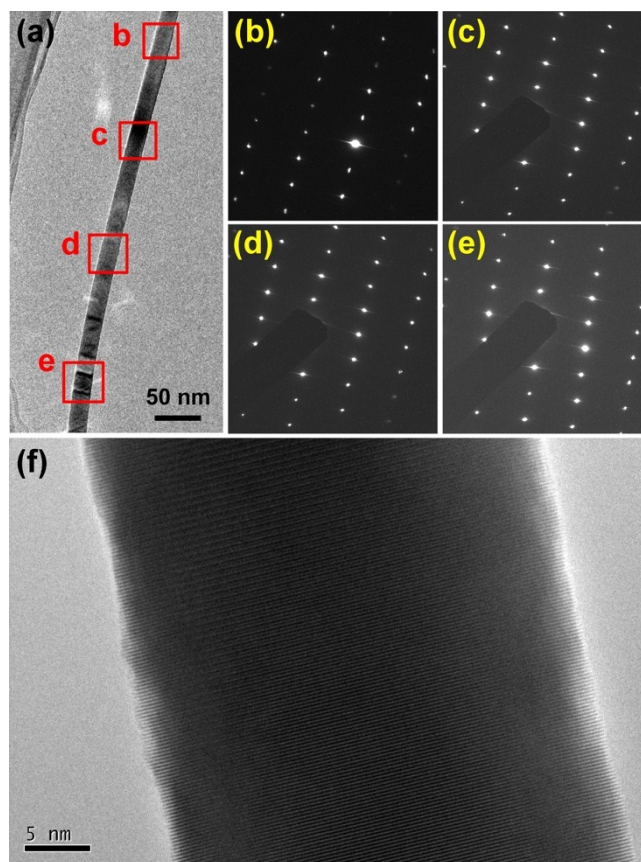
---

\* Corresponding authors.

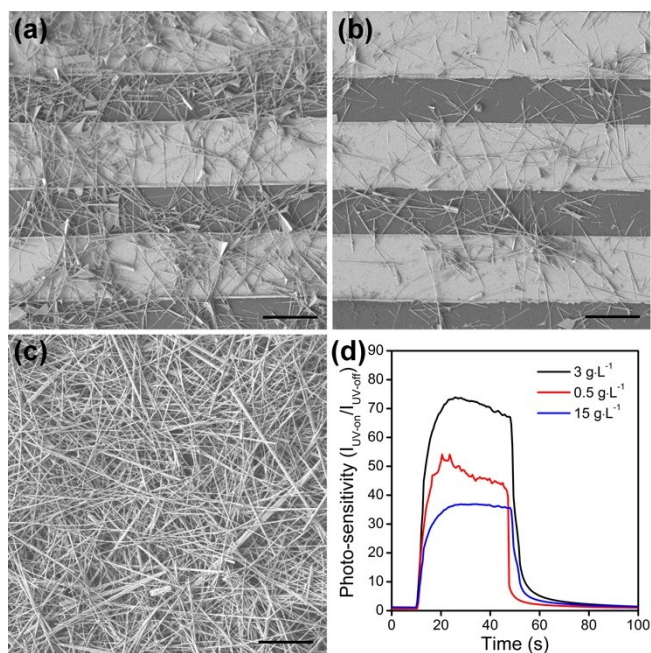
Email: [xianglan@mail.tsinghua.edu.cn](mailto:xianglan@mail.tsinghua.edu.cn) (L. Xiang); [sxk7@psu.edu](mailto:sxk7@psu.edu) (S. Komarneni)



**Figure S1.** Low-magnification SEM images and corresponding length and diameter distribution of the nanowires (a, b) and microrods (c, d). The size distribution was estimated by directly measuring about 200 particles from the SEM images.



**Figure S2.** TEM image (a) and SAED patterns performed at different locations along a single nanowire (b-e); (f) a typical HRTEM image recorded on a large area of a single nanowire.



**Figure S3.** SEM images (a-c) of the nanowire networks with varying density on the electrodes at different concentration ( $\text{g}\cdot\text{L}^{-1}$ ) of the spin-coating suspensions: (a) 3; (b) 0.5; (c) 15; scale bars: 50  $\mu\text{m}$ ; (d) photocurrent rise/decay curves of the UV photodetectors based on the the nanowire networks with different densities at a bias of 5.0 V.