## **Electronic Supplementary Information (ESI)**

Controlled Synthesis, Asymmetrical Transport Behavior and Luminescence Properties of Lanthanide Doped ZnO Mushroom-like 3D Hierarchical Structures

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**Figure S1.** (a) STEM-SEI image of an individual ZnO:  $Eu^{3+}$  mushroom. (b)~(d) EDS elemental mapping for Zn, Eu and O of the individual mushroom shown in (a), respectively.