

Supporting Information

The battery is targeted for dry implantation and to then be activated by body fluids. Thus, we have developed a sealed battery which consists of zinc foil (anode), PPy/CNT deposited cellulose membrane (cathode and separator), and stainless steel mesh (current collector). A picture of a battery of this type is shown below in Fig. S1. The stainless steel mesh was pasted onto the electrodes using highly conductive silver paste, and the battery was sealed with water permeable filter paper.

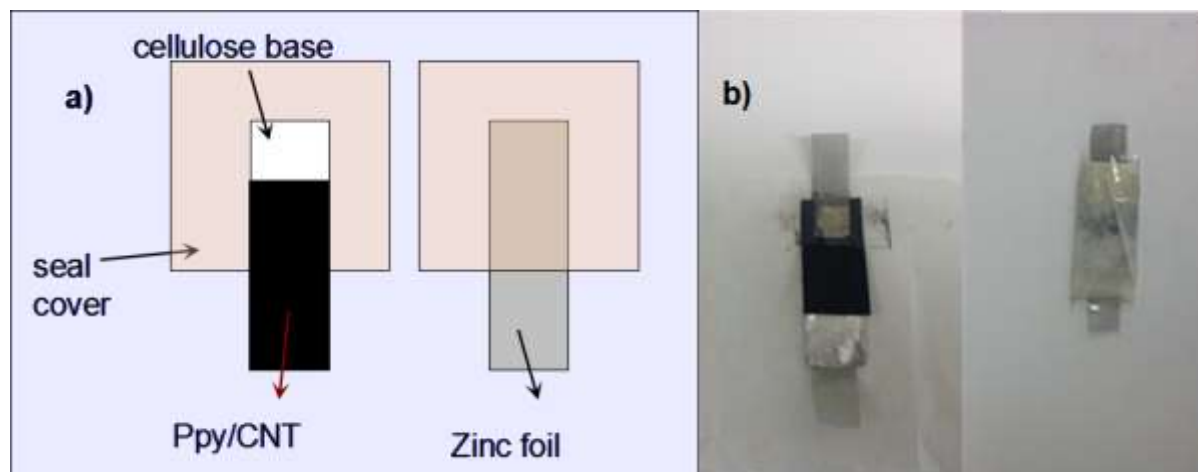


Figure S1. Schematic graph (a) of the battery design and Digital photographs of (b) a internal view of the battery (left) and a sealed battery (right). (The PPy/CNT composite used in this battery is made from 0.1 M Py + 0.4mg/ml CNT.)

Fig. S2 shows the discharge curve of this battery at the current density of 40 mA/g (calculated based on the actual weight of PPy/CNT electrode). The capacity of the sealed cell is 326 mAh/g, which is lower than that of the open cell. The specific capacity of the sealed battery is much lower than that of the open cell, mainly because the oxygen concentrations of these two cells are different. Less oxygen participated in the anode reaction ' $2\text{Zn}^{2+} + \text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^- \rightarrow 2\text{Zn}(\text{OH})_2$ ' in the sealed battery, causing the decrease in the battery capacity.

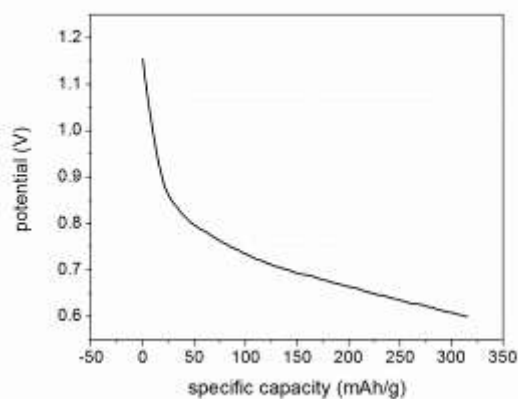


Figure S2. Discharge curve of the sealed PPy/CNT|Zn cell immersed in the revised simulated body fluid.

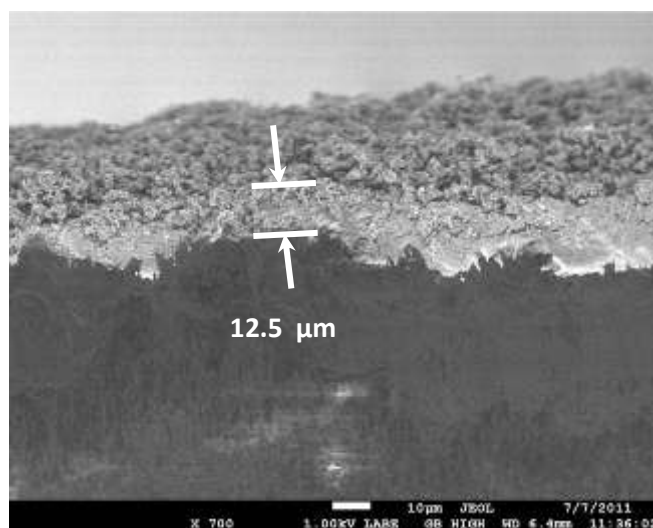


Fig. S(3) The filed emission electron microscopy image of film prepared by the composite made from 0.1M pyrrole + 0.4g mg/ml CNT.