
Printed Batteries to Power Wearable Sensors

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Global societal health challenges are increasingly reliant on wearable devices which can enable continuous monitoring of key indicators used to trigger interventions. Wireless and continuous monitoring can be achieved by self-powered sensor platforms which rely on energy storage devices such as batteries. Commercially available batteries are normally large, rigid and difficult to customize. In this talk, I will present our work on 3D printed miniaturized supercapacitors and rechargeable aqueous batteries, to power wearable sensors platforms. We use earth-abundant electrode materials and water-based electrolytes or gel electrolytes, to manufacture energy storage devices on flexible substrates.

I will discuss the materials challenges in formulating functional inks of nanomaterials and different architectural designs to optimize the electrochemical performance. I will then show how these devices can power wearable sensors from commercial Bluetooth proximity sensors to organic electrochemical transistors (OECT).