

Supplementary Information for:

Soft Electrodes Combining Hydrogel and Liquid Metal

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Electrode Fabrication

Figure S1 describes how the electrodes were fabricated for ECG testing. Three thin pieces of PDMS (Sylgard-184, Dow) were prepared. The bottom layer consists of a smooth piece of PDMS punched with a 10 mm wide hole. This hole houses the conductive hydrogel disc that interfaces the skin. The second piece consists of a molded PDMS. This layer defines a microchannel that is 15 mm long with dimensions of 400 μm wide by 400 μm tall. A 3 mm wide hole is punched at one end of this channel. These two pieces of PDMS are then oxygen plasma treated and bonded together, such that the microfluidic channel is oriented on the opposite side of the bottom PDMS piece. One final piece of smooth PDMS is then attached to the top of this PDMS device, interfacing the microchannel, through oxygen plasma treatment. This layer covers and completes the microchannel. The device is then cut with a razor blade across the microfluidic channel to open the end. EGaIn is injected with a syringe and then a copper wire is inserted to interface the EGaIn.

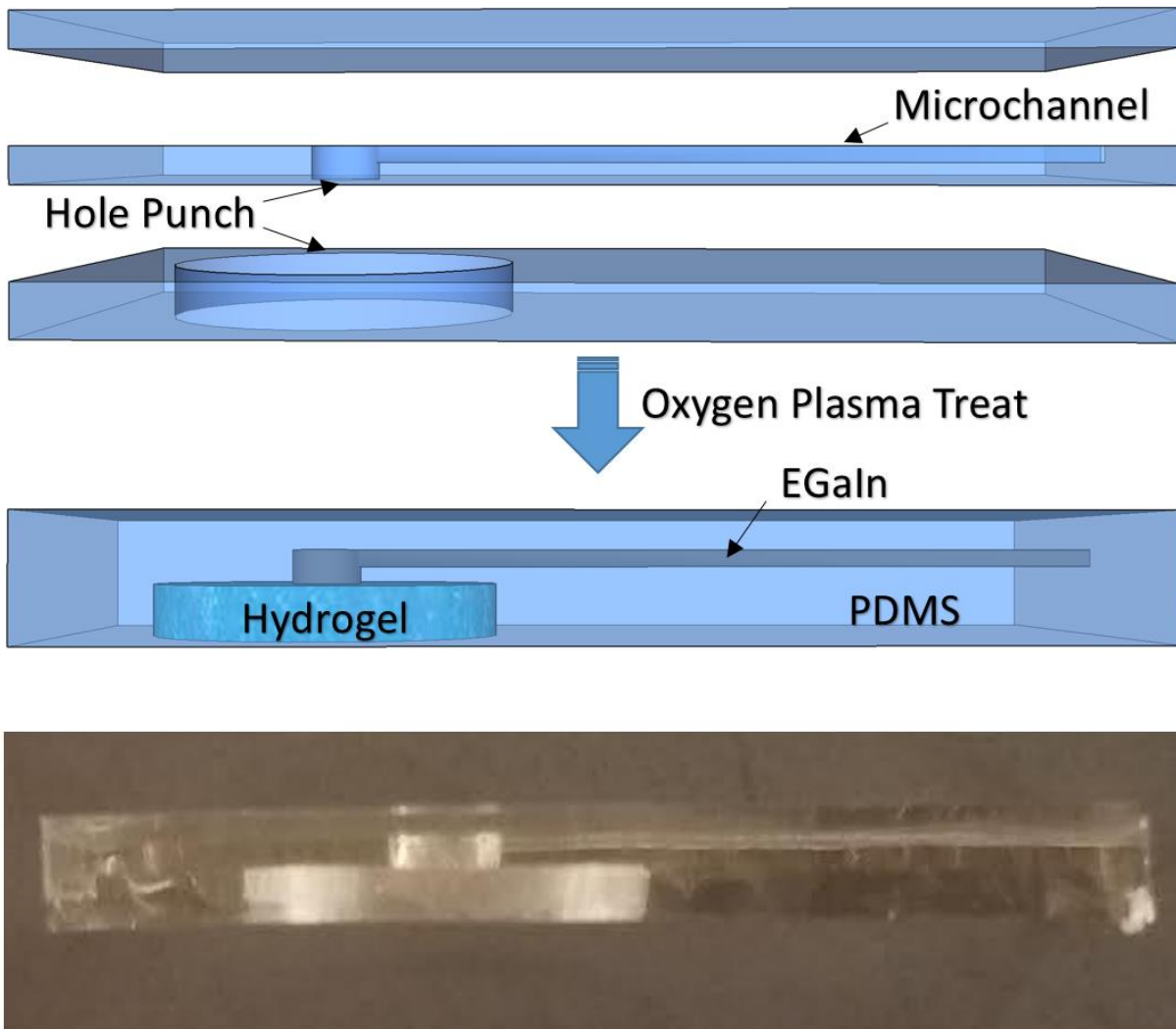
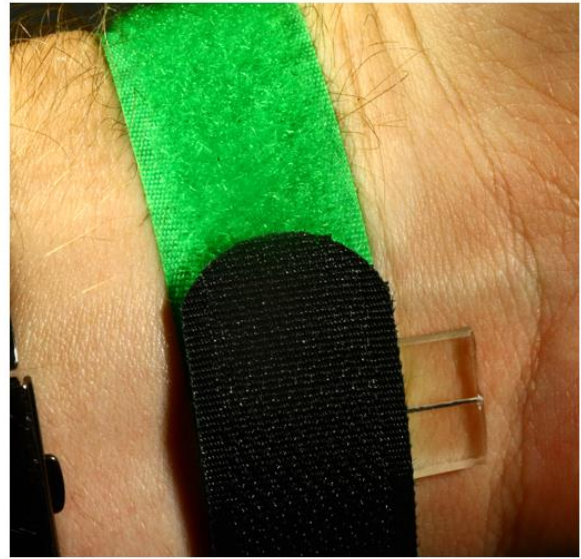
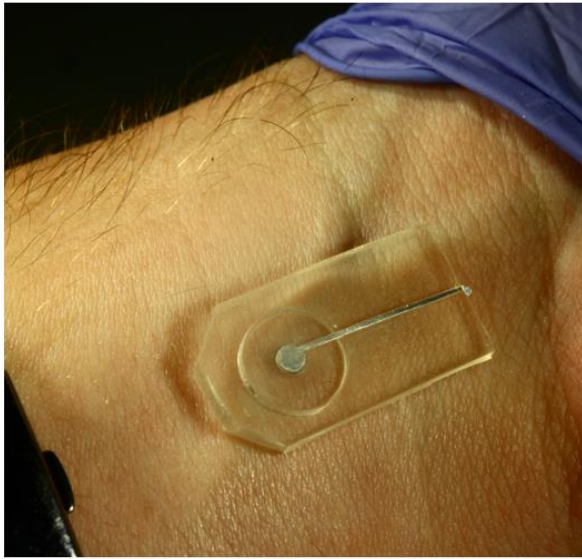


Figure S1: Schematic of the ECG electrode fabrication utilizing multiple soft lithography steps. Three sheets of PDMS are oxygen plasma treated together to create the microchannels. EGaIn is injected into the microchannel and hydrogels are inserted into the hole. A photograph of a PDMS electrode with no injected EGaIn or hydrogel can be seen on the bottom.

ECG Testing

For impedance and ECG testing, the electrodes were adhered to the skin with a Velcro strap. Copper wires were inserted into the end of the microchannel to interface the EGain, and then connected to the recording device. The electrodes were placed on the wrist. The Velcro strap was then tightened around the electrode during the period of testing.



Figures S2: Photographs showing the electrode interfacing the skin (no copper wire shown) and the Velcro band used to adhere the electrode to the skin.