Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

High-Density Nanowire Electrode on Paper for Biomedical Applications

*Pooria Mostafalu, Sameer Sonkusale**

In Table S1, resistance of electrodes with same surface area and length on different types of paper is investigated. It shows electrodes on smoother paper, like photo paper, create better contact.

Table S1. Reistance table of silver ink electrode on different types of paper.

Paper	Resistance (Ω)
Photo paper	0.3
1 Chr	0.45
3MM Chr	0.5
Plasma treated wax paper	0.4
Plasma treated parchment paper	0.4

Figure S1 Compare the impedance of silver and silver ink electrode in dry state and wet state. It shows that these two electrodes have very close resistance in the dry state and provide the same impedance in phosphate buffer solution.

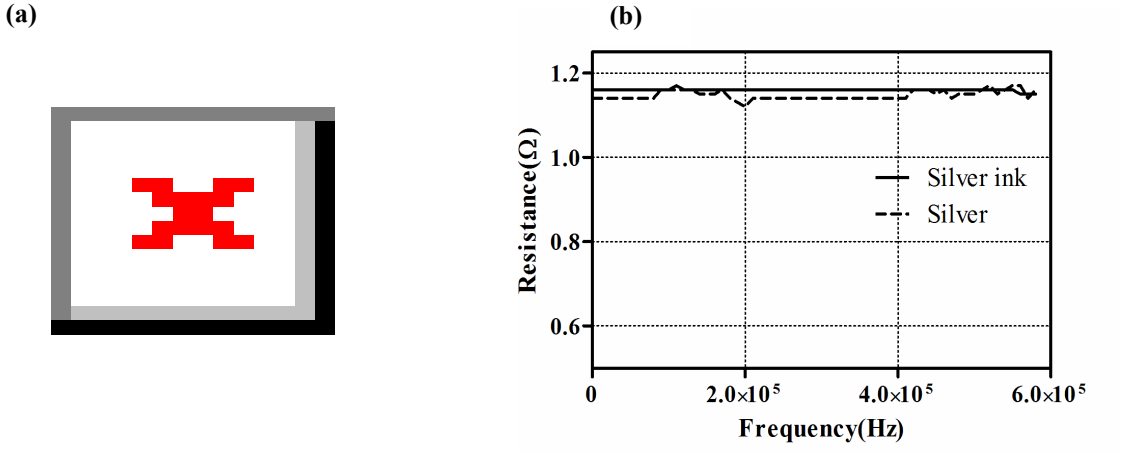

Fig. S1 Comparison of impedance in silver and silver ink. (a) In wet state. (b) In dry state.

3D-printed electrochemical cell was utilized for electrodeposition of nanowire (Figure S2a). Figure S2b shows ECG measurement methodology: two high density nanowire electrodes were attached to left and right arms and regular bare electrode was attached to right leg. Left leg also grounded using other regular electrode. The schematic of electronic read-out for recording of an ECG signal is shown in Figure S2c. Low power instrumentation amplifier A1 was used for amplification of ECG signal with gain of 10. The other stage of the amplifier was used to drive the right leg. A different filter and guard could be used to remove the noise which is not the focus of this study.

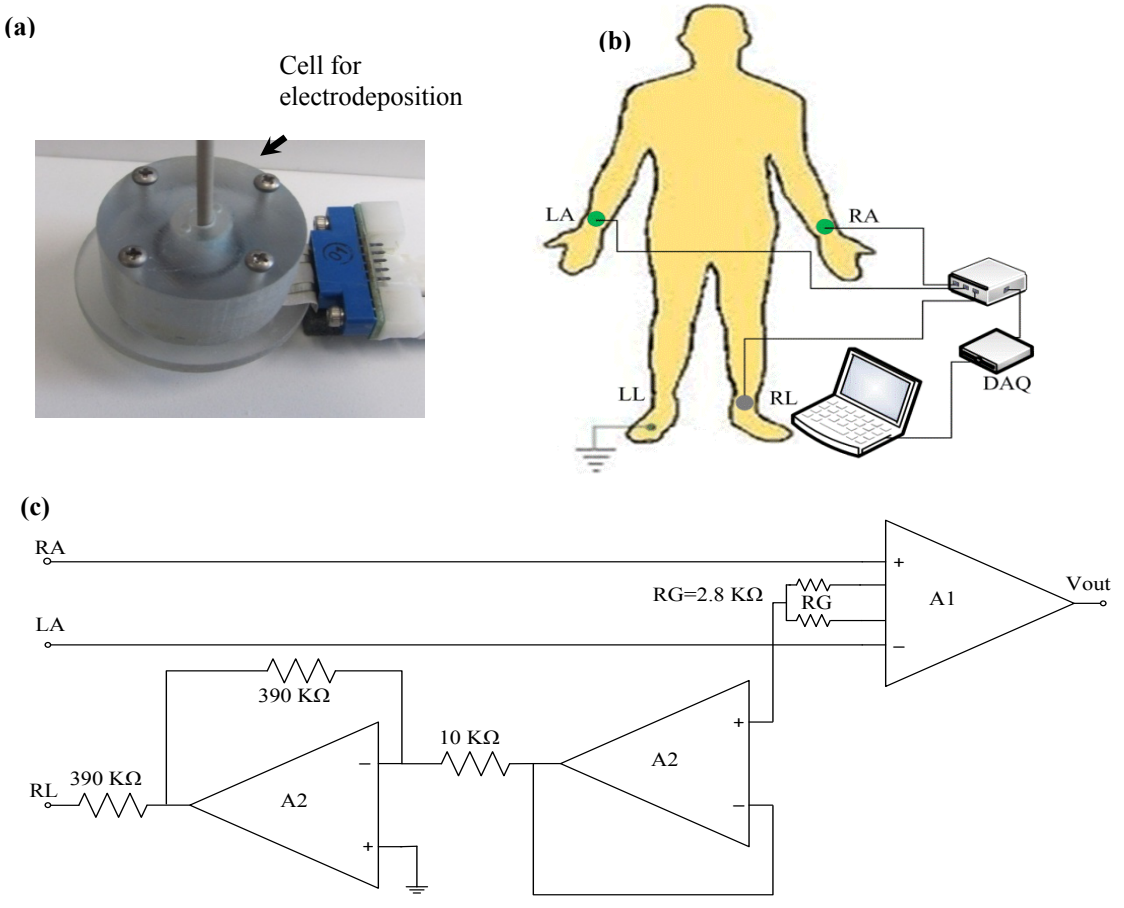

Fig. S2 (a) 3D-printed electrochemical cell used for electrodeposition. (b) ECG measurement methodology. (c) Schematic of electronic read-out for recording of ECG signal.

Figure S3 shows more result for recorded ECG signal in different time to illustrate stability of electrodes.

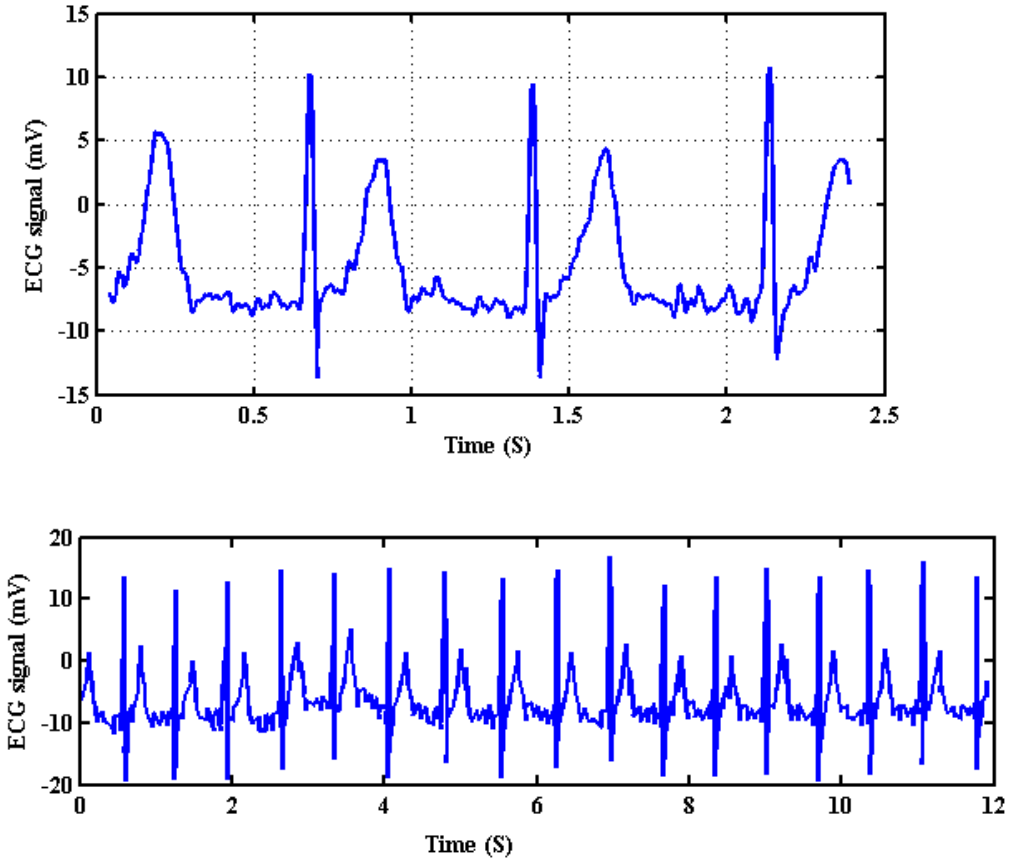

Fig. S3 Recorded ECG signal for one set of electrodes in different time.