A wireless-powered biobooster on soft contact lens

Fang Shujie.[1] *Taiki Takamatsu,*[1] *Te Xiao,*[1] *Lunjie Hu,*[1] *Lu Chen*[1], *Takeo Miyake*[1]
[1]Graduation School of Information, Production and System, Waseda University, Japan
E-mail: fangsj1008@akane.waseda.jp

Abstract:

Wearable skin electronics is a next generation product that monitor biological signals from the human to the electronic devices. Numerical technological advances have been reported for thermal, strain and chemical sensors on the skin and for neuron-stimulated soft electronics on the brain. Even we could have a lots of wearable devices on the human skin, the final question is “the power supplies from where? on the skin”. To overcome this issue, Miyake’s lab developed two types of wireless power generation devices on eye surface: one is enzymatic power generation from biofuels [1], especially glucose in tears, and the other is wireless power transfer system between an eyeglass/contact lens [2]. These wearable source voltages were around 1.2 V. This voltage is insufficient to operate devices for some applications, but water electrolysis will happen when incensing the applied voltage over 1.2 V in aqueous solution. Here we have developed a hybrid power source using biofuel cell DC power and electromagnetic wireless AC power that boosts an output voltage over 2.8 V without water electrolysis in an artificial tear solution. Furthermore we demonstrated our hybrid power source to light a blue LED on soft contact lens. In the poster, we will explain more details of the experimental results and discussion.

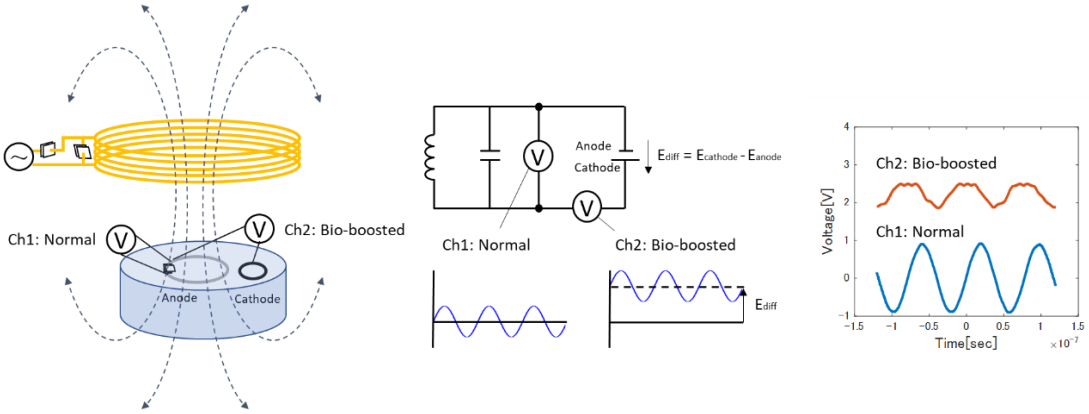

Figure 1. A hybrid power source using wireless power transfer (WPT) system (AC voltage) and biofuel cell system (DC voltage) on the contact lens.

REFERENCES

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DOI: https://doi.org/10.1016/j.bios.2019.111471
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