

## Glucose biofuel cell using enzyme-CNT microfibers

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An enzymatic biofuel cell (BFC) is a type of fuel cell that enables harvesting electrical energy from biofluids such as juices and bloods without purification by using enzymes biocatalysts. Prof. Miyake presented many types of BFCs in previous JSAT conference. Examples include a flexible, stretchable and layered power source<sup>1</sup>, a needle-type cell<sup>2</sup> for inserting raw grape and blood vein, a self-powered glucose indicator<sup>3</sup>. Here we present enzyme-CNT microfibers that generate a power from glucose. Such enzymatic power microfibers can be woven on T-shirts or patched on skins.

Our BFC was constructed using the NAD<sup>+</sup>-dependent glucose dehydrogenase (GDH)-based bioanode and the bilirubin oxidase (BOD)-based biocathode. We measured all performances with potentiostat. Our preliminary result is 230mW/cm<sup>2</sup> at 0.3V. In my presentation, I will discuss the detail about experimental results.

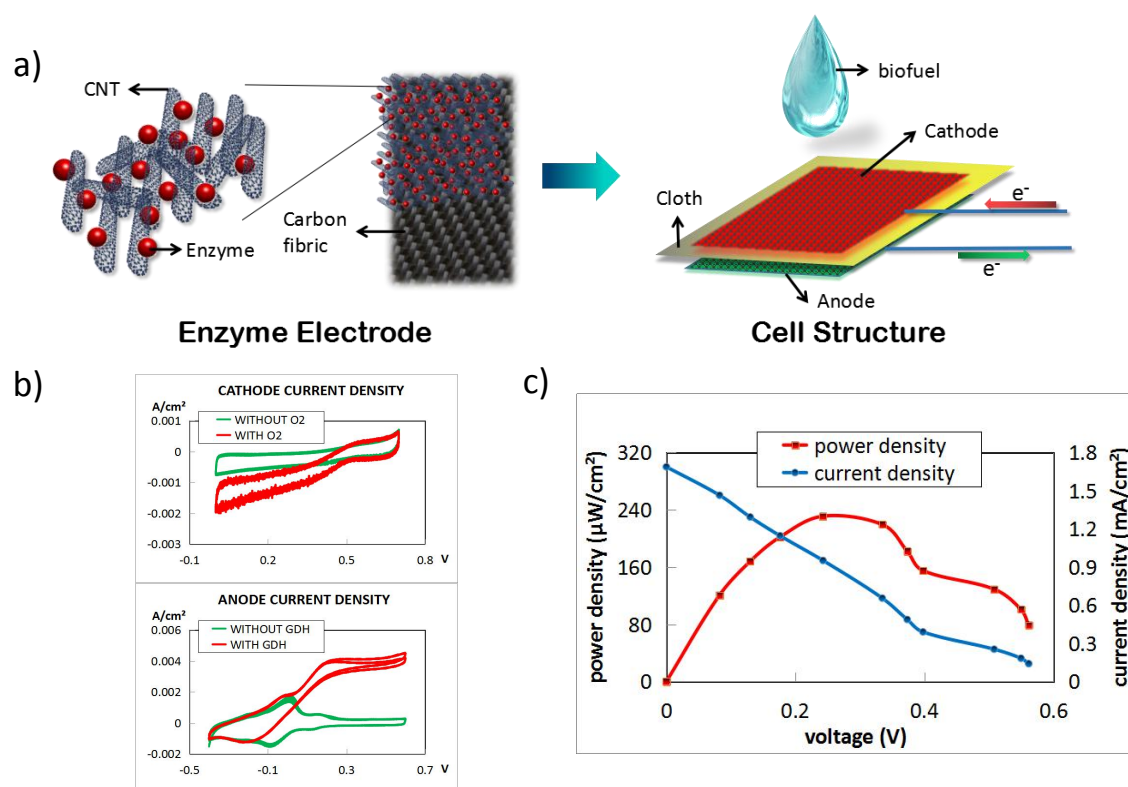


Fig.1 a) Biofuel cell using enzyme-CNT fibers. b) Current density of the biocathode and the bioanode. c) Power density of the biofuel cell.

### Reference

- [1] Miyake&Nishizawa, et.al, Biosens. Bioelectron, 74, 947-952 (2015).
- [2] Miyake&Nishizawa, et.al, Energy. Environ. Sci., 4, 5008-5012 (2011).
- [3] Miyake&Nishizawa, et.al, Adv. Energy. Mater., 3, 60-64 (2013).