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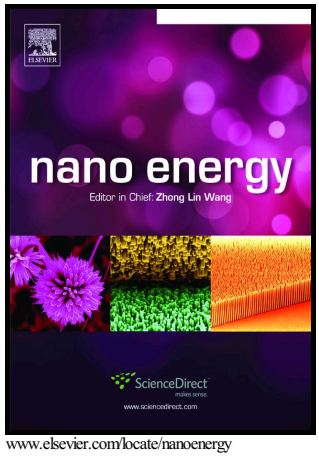


www.elsevier.com/locate/nanoenergy

PII: S2211-2855(18)30393-8
DOI: https://doi.org/10.1016/j.nanoen.2018.05.072
Reference: NANOEN2780

To appear in: *Nano Energy*

Received date: 24 March 2018
Revised date: 3 May 2018
Accepted date: 30 May 2018

Cite this article as: Tong Lin, Wenqi Ding, Liming Sun, Lei Wang, Chen-Guang Liu and Hao Song, Engineered *Shewanella oneidensis*-reduced graphene oxide biohybrid with enhanced biosynthesis and transport of flavins enabled a highest bioelectricity output in microbial fuel cells, *Nano Energy,* https://doi.org/10.1016/j.nanoen.2018.05.072

# Engineered *Shewanella oneidensis*-reduced graphene oxide biohybrid with enhanced biosynthesis and transport of flavins enabled a highest bioelectricity output in microbial fuel cells

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## Abstract

Low rate of extracellular electron transfer (EET) of exoelectrogens was a major bottleneck in restricting the performance of the microbial fuel cell (MFC) from practical applications. We used synthetic biology approaches (promoter and ribosome binding site (RBS) engineering, and cell surface engineering) to rationally design *Shewanella oneidensis* for enhanced flavins biosynthesis and transportation in a hydrophobic chassis to boost its EET rate and performance. Graphene oxide (GO) was subsequently used to construct an engineered *Shewanella*-reduced GO (rGO) 3D self-assembled biohybrid, which dramatically enhanced the thickness and cell numbers in the electroactive biofilm on the anode. Meanwhile, the absorption of