Electricity generation and microbial community response to substrate changes in microbial fuel cell - DTU Orbit (11/01/2019)

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The effect of substrate changes on the performance and microbial community of two-chamber microbial fuel cells (MFCs) was investigated in this study. The MFCs enriched with a single substrate (e.g., acetate, glucose, or butyrate) had different acclimatization capability to substrate changes. The MFC enriched with glucose showed rapid and higher power generation, when glucose was switched with acetate or butyrate. However, the MFC enriched with acetate needed a longer adaptation time for utilizing glucose. Microbial community was also changed when the substrate was changed. Clostridium and Bacilli of phylum Firmicutes were detected in acetate-enriched MFCs after switching to glucose. By contrast, Firmicutes completely disappeared and Geobacter-like species were specifically enriched in glucose-enriched MFCs after feeding acetate to the reactor. This study further suggests that the type of substrate fed to MFC is a very important parameter for reactor performance and microbial community, and significantly affects power generation in MFCs.

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