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Screening of novel microbial catalyst in Bioelectrochemical systems (BES)

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Microbial Electrosynthesis (MES) is an artificial type of photosynthesis for microbial conversion of carbon dioxide (CO₂) to organic chemical commodities when it utilizes the electricity from the solar cell. Some of acetogens, obligate anaerobic bacteria able to accept electrons from the cathode and produce chemicals. Until now, limited numbers of microorganisms have been defined for the cathodic reduction of CO₂ in MES system. The electron transfer rate from the cathode to the best electro autotroph *S. ovata* 2662, are still significantly lower than what is observed in bio-anodic processes with other electro-trophic bacteria. Hence, we are screening other pure cultures for better MES activities. With the objective of finding new cathodic biocatalysts, pre-selections of acetogens were done based on their performance in syngas fermentation technology. In our study, novel electro-trophic bacteria have been identified with the production rate of 368.8 mM per day per m² for 14 days, which is almost three-fold higher than the best reported result in the literature obtained with a pure culture of a different strain of *Sporomusa ovata*.

Keywords: - Microbial electrosynthesis, CO₂ reduction, *Sporomusa ovata*