

Expression of Recombinant Cellobiose Dehydrogenase from *Phanerochate chrysosporium* and its Application to Biofuel Cell

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The cellobiose dehydrogenase (CDH) is considered as capable element of carbohydrates detector in biofuel cell application based on its versatile biorecognition. Recently, CDH has been studied as an important candidate for anode biocatalyst for enzymatic fuel cells based on its positive performance of electron transmitter. In this study, a gene encoding *cdh* from *Phanerochate chrysosporium* has been cloned into pPICZαB and expressed in the methylotrophic yeast *Pichia stipitis*, under the control of the AOX1 methanol inducible promoter. The recombinant CDH (rPcCDH) was purified using a metal ion affinity chromatography column under non-denaturing conditions for further application on modified electrode. The biofuel cell was established with purified rPcCDH and laccase on anode and cathode, respectively. The performance of this biofuel cell evaluated that cell's open circuit voltage was 0.435 V and the maximum power density was $310 \pm 5.2 \mu\text{W}/\text{cm}^2$ at 0.247 V in an air-saturated sodium acetate buffer with pH 4.5 at 37 °C containing 10 mM lactose.