

## Comparison of graphite oxide and heme mediator for lactose biosensor using cellobiose dehydrogenase

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Cellobiose dehydrogenases (CDH) structure consists of two distinct domains, dehydrogenase domain and cytochrome domain, which contains catalytically active flavin adenine dinucleotide (FAD) and heme b, respectively. Based on the enzyme structure, CDH has been reported in electrochemical applications such as enzymatic biofuel cells and biosensors.

In this study, heterologous expression of the *cdh* from *Phanerochaete chrysosporium* KCCM 60256 in *Pichia pastoris* X-33 was achieved for efficient production of a recombinant enzyme (PcCDH). To establish a lactose biosensor system, graphite oxide and heme were selected for mediator composition. The biosensor showed efficient electron transfer and exhibited an extraordinary high current density in a 100 mM lactose solution at pH 4.5. The biosensor detection represented high sensitivity in a large linear range from 1 to 150 mM of lactose solution. The successful demonstration of this study suggests the potential development of lactose biosensor based on the application of PcCDH.