

Hydrogen Production from Lignocellulosic Biomass by *Clostridium thermocellum*조지혜^{1,2,*}, PinChing Maness¹¹National Renewable Energy Laboratory;²한국환경정책평가연구원

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Clostridium thermocellum is a thermophilic and cellulolytic anaerobe. It metabolizes cellulose to cellobiose and cellodextrin, which are then taken up by the cells and undergo glycolysis yielding H₂, CO₂, formate, lactate, acetate, and ethanol as mixed co-products. Hydrogen metabolism in *C. thermocellum* is catalyzed by hydrogenase enzymes, which can be classified as FeFe- or NiFe-type based on the metal content in its active site. Analysis of the sequenced genome of *C. thermocellum* reveal the presence of up to four hydrogenases, three of which belonging to the FeFe-type, one the NiFe-type. The bacterium is remarkably versatile in employing various enzymes, some of which are potentially novel, for hydrogen metabolism. Little is known as to their underlying physiological functions and their contribution in fermentative H₂ production. More in-depth knowledge and biochemical information of the hydrogenases in *C. thermocellum* will help engineer the microbe for improved H₂ production.