극한미생물을 이용한 C1물질활용 바이오수소 생산 (One-carbon based biohydrogen production using a hyperthermophilic archaeon)

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Thermococcus onnurineus NA1 was isolated from a deep-sea hydrothermal vent. It was shown that T. onnurineus NA1 is capable of producing H2 under anaerobic growth conditions supplemented with CO, formate, or starch (Kim, Lee and Kim et al. 2010). The polyphasic approach by employing transcriptomic, proteomic and metabolomic tools allowed us to understand how the strain regulates the metabolism upon the presence of one carbon substrates coupled with H2 production (Lim et al. 2014). Currently, we are trying to enhance H2 productivity by the combination of genetic and process engineering tools, and H2 production rate of the engineered strains was significantly enhanced on CO or by-product gas of steel-mill process (Rittman and Lee et al 2015). Recently, H2 production from CO has been demonstrated at the pilot scale bioreactor. The result and future prospect would be discussed.