

Bioenergetics of *Eubacterium limosum* and reaction conditions for the high concentration of organic acids production

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Acetogens, use CO as a carbon and energy source to synthesize acetic acid through the Wood-Ljungdahl Pathway. Additionally, acetogens produce butyric acid, butanol, butanediol as well as other high reducing substances. The acetic acid is considered to be the most beneficial reducing substance due to amount of energy conversion. Variation in the fermentation conditions such as increased acetic acid concentration, or pH reduction decrease acetic acid productivity and trigger the production of high reducing substances. Besides being more valuable, separation of high carbon products require high separation cost. Therefore, the strains and target products to be used in the C1 bio-refinery process should be accurately set. *Eubacterium limosum* (Elm) is an acetogen that has an excellent CO utilization ability and organic acid productivity. ELM has secured a toolbox for genome information and recombinant microorganisms are developed. In this study, we analyzed the bioenergetics for the production of high titer acetic acid by using Elm strain and proposes the improvement in the strain, the fermentation environment and the reaction conditions which can increase the productivity.