Finding Alternative 3-hydroxy Propionic Acid Pathways Using *Generalized Enzyme Function* Method

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At 2004, U.S. Department Of Energy reported twelve high-value added building blocks which can be yield from biomass and converted to various desirable chemicals subsequently. The building blocks are filtered by several screening steps and then twelve top value added chemicals are selected. Among them, we tried to find out the alternative synthetic route of 3-hydroxy propionic acid, which is existing only the pathway under the patent currently, using our computational framework which adopts *Generalized Enzyme Function* method. Finally we displayed the *Gibbs Free Energy* with *Group Contribution* method. The propanoate metabolism is considered as an original pathway and several alternatives are found; for example, Acetyl-CoA to the 3-HPA through enzyme reactions such as 4.1.1.9, 1.2.1.18, and 1.1.1.59.

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