

Novel pathway design for the production of high value-added chemicals

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There have been many efforts in developing systematic platforms to predict novel metabolic pathways for the efficient production of industrially desirable chemicals. In this trend, we developed a systematic framework that generates metabolic pathways along with their candidate enzymes through a prioritization process in order to identify feasible novel pathways for the target chemicals. The systematic framework consists of two parts, route generation and prioritization process. The novel synthetic pathways for the three chemicals, isobutanol, 3-hydroxypropionate (3HP) and butyryl-CoA, were predicted using our system to evaluate the capacity and reliability of the framework. [This systematic framework should be an additional resource useful for the practice of synthetic biology and metabolic engineering. [This work was supported by the Technology Development Program to Solve Climate Changes (systems metabolic engineering for biorefineries) from the Ministry of Education, Science and Technology (MEST) through the National Research Foundation of Korea (NRF-2012-C1AAA001-2012M1A2A2026556)]