Systems Metabolic Engineering of *Escherichia coli* for the Production of 1,4-diaminobutane

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1,4-Diaminobutane, also known as putrescine, is an important nitrogen-containing platform chemical. In particular, current production of putrescine on industrial scale relies mainly on chemical synthesis. Here we show a sustainable bio-based process for putrescine production using metabolically engineered strain of *Escherichia coli*. We first inactivated the putrescine degradation and utilization pathways. Next, ornithine decarboxylase which converts ornithine to putrescine and ornithine biosynthetic genes were overexpressed. RpoS was also deleted. The final engineered strain produced 1.68 g L^{-1} of putrescine. Furthermore, high cell density cultivation enabled production of 24.2 g L^{-1} of putrescine within 32 hour. The strategy reported here should be useful for the bio-based production of putrescine from renewable resources. [This work was supported by the Korean Systems Biology Research Project (20090065571) of the Ministry of Education, Science and Technology (MEST) through the National Research Foundation of Korea (NRF). Further supports by the World Class University Program (R32-2008-000-10142-0) of the MEST, LG Chem Chair Professorship, IBM SUR program, and Microsoft are appreciated].