# Enhanced lycopene production of *Escherichia coli* using gene amplification

Han Min Woo[1], Hyung Seok Choi[1], and Sang Yup Lee[1,*]

[1]Metabolic and Biomolecular Engineering National Laboratory, Department of Chemical and Biomolecular, Korea Advanced Institute of Science and Technology

TEL: +82-42-869-5970, FAX: +82-42-869-8800

Lycopene which is a reddish pigment produced by vegetable and fruits such as tomatoes and pink grapefruit has received a lot of attention from many researchers in recent years, and widely used as an antioxidant, anti-cancer agent, and cosmetic ingredient. Combinatorial engineering for direct synthesis of desired products and systems biology to interfere metabolic design from complete genome of *Escherichia coli* have been emerged to enhance lycopene production. All carotenoid are synthesized from a common metabolic precursor IPP[1)] ($^3$-Isopentenyl pyrophosphate), and one of the key points for lycopene production is for proper supply of precursors[2)] at branch points. In this study gene amplifications are evaluated and calculatedby constrained-based flux balance to investigate flux distribution on metabolic network with heterologous lycopene producing genes on bievel profile. As a result of metabolic redesign, metabolic engineered strain produced more lycopene contents. This work was financially supported by National Research Laboratory Program (2000-N-NL-01-C-237) of the Ministry of Science and Technology,and LG chemicals Chair Professorship. Hardware for computational analysis was supported by the IBM-SUR program.

## References

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