Metabolic Engineering Strategies and Applications Employing Information from Genomics, Transcriptomics, Proteomics and Fluxomics

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Metabolic engineering plays an essential role in modern biotechnology as it allows various bioprocesses to be competitive with existing chemical processes. Metabolic engineering can be defined as the purposeful modification of metabolic pathways to achieve a number of biotechnolgically relevant desired goals. Recent advances in genomics, transcriptomics, proteomics, metabolomics and even fluxomics are allowing us to examine the metabolic pathways and networks at systems level. Here I present the results taken in our group to achieve a number of biotechnological objectives by metabolic engineering based on systems biotechnological approaches. Systems biotechnology, the term coined by Systems biology, can be defined as (by following the definition of biotechnology by the OECD) "The application of science and technology at systems level to living organisms as well as parts, products and models thereof, for the production of knowledge, goods and services". In practice, all the information and data available (and/or generated in house) from traditional and modern biological sciences, including genomics, transcriptomics, proteomics, metabolomics, fluxomics and etc., are all integrated at systems level for the development of bioprocesses as well as parts thereof. In this lecture, systems biotechnological approaches taken to enhance the production of recombinant proteins and primary metabolites will be presented. [This lecture is public presentation of the 5 year research carried out by the recipient of the First Young Scientist's Award from the President of Korea and the KAST.]

References

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