

Proteomic Approaches for Industrial Applications

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Genome-wide analysis of microbial proteome and molecular regulation processes has become a considerable area of Proteomics. These studies have been made possible by several advances, including completion of the microbial genome sequencing, striking appearances of powerful bioinformatics tools, and high-throughput proteomics, and maturation of Metabolomics. Despite these advances, relatively little effort has been expended in the bacterial engineering arena to develop and use integrated research platforms in a systems biology approach to enhance our understanding of industrial processes. This review discusses progress made in exploiting microbial proteomics with an integrated genome-wide research platform to gain new knowledge about how the industrial application of microbe group. Several *Streptomyces* produce many kinds of secondary metabolites. Results of these systemic researches have provided many new avenues for basic genome structures to metabolic engineering of the polyketide synthesis. One goal in summarizing this line of study is to bring exciting new findings to the attention of the industrial applications. In addition, we hope this research will stimulate investigators to consider using analogous approaches for analysis of the molecular combinatorial biosynthesis of other microbes. Beyond application of industrial bio-productions by various kinds of industrial microbes, genome-wide metabolic reconstruction could be possible through systemic proteomics guided by bioinformatics tools

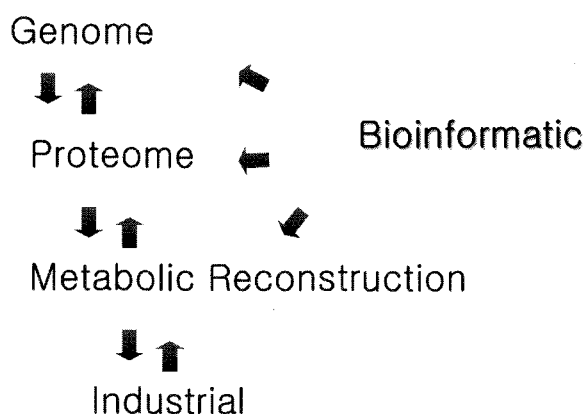


Fig. 1. New advances of integrated bioinformatics tools are the driving power of new technology to industrial applications. Genome wide metabolic reconstruction can be guided by these progresses.

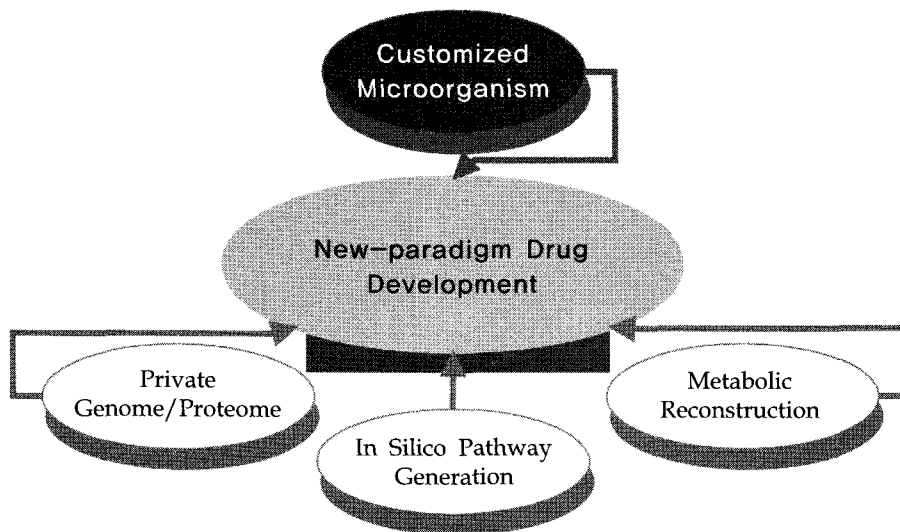


Fig. 2. A schematic diagram of systems microbiology for the polyketide development. The molecular combinatorial biosynthesis of polyketides is one of the most successful evidence of researches in systems microbiolog.