

Metabolic Control Analysis of Various Dynamic Behaviors of Biochemical Systems

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Metabolic control analysis is a useful tool to understand and predict the dynamic behaviors of biochemical systems. While the classical metabolic control coefficients are defined only for the systems with steady-state trajectories, many important dynamic behaviors do not reach the steady-state, but show the oscillatory or irregular behaviors. This study proposes the investigation scheme for metabolic control analysis of the every dynamic system regardless of the existence of steady-state, by classifying the systems into three groups: the systems with steady-state trajectories, autonomously oscillating systems and the other systems with irregular behaviors. [This work was supported by the Korea Science and Engineering Foundation (KOSEF) grant funded by the Korea government (MOST) (No. M10309020000-03B5002-00000). Further supports by LG Chem Chair Professorship, Microsoft and IBM SUR program are appreciated.]