Steady-State Kinetics of Bifunctional Enzymes. Taking into Account Kinetic Hierarchy of Fast and Slow Catalytic Cycles in a Generalized Model

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Abstract—A steady-state approximation of the generalized two-dimensional model of a bifunctional enzyme catalyzing independent proceeding of two one-pathway reactions is considered in a case of mutual influence of the active sites. Coexistence of fast and slow catalytic cycles in the reaction mechanism is analyzed. Conditions when the hierarchy of fast and slow catalytic cycles allows simplification of a two-dimensional model and its reduction to the one-dimensional cyclic schemes were determined. Kinetic equations describing these simplified schemes are presented.

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