

LARGE-TIME BEHAVIOUR OF THE REVERSIBLE ENZYME REACTION SYSTEM

Ján Eliaš¹, Jean Clairambault² and Benoît Perthame³

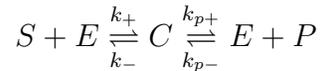
¹Jacques-Louis Lions Laboratory
University of Pierre and Marie Curie
4 place Jussieu, 75252 Paris, France
jan.elias@inria.fr

²Mamba, INRIA Paris-Rocquencourt
Domaine de Voluceau, BP 105, 78153 Rocquencourt, France
jean.clairambault@inria.fr

³Jacques-Louis Lions Laboratory
University of Pierre and Marie Curie
4 place Jussieu, 75252 Paris, France
benoit.perthame@upmc.fr

Abstract

In eukaryotic cells, responses to a variety of stimuli consist in chains of successive protein interactions where enzymes play significant roles, mostly by speeding up reactions. Enzymes are catalysts that help to convert other molecules (generally proteins) called substrates into products, but they themselves are not changed by the reaction. In the reaction scheme proposed by Michaelis and Menten in 1913 [3], the enzyme E converts the substrate S into the product P through a two step process with the intermediate complex C . However, nearly all enzymes increase the speed of the reaction in both directions (P can also combine with E to form C), following thus the scheme



for the reversible enzyme reaction. The large-time behaviour of a reaction-diffusion system for the reversible enzyme reaction is studied by means of the relative entropy convergence. Roughly speaking, instead of an investigation of the direct convergence of the concentrations to their equilibria, we show exponential decay of the respective relative entropy to zero as the time tends to infinity [1, 2].

REFERENCES

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