

The Significant and Profound Impacts of the Studies on the Rate of Diffusion-Controlled Reactions of Enzyme

Kuo-Chen Chou*

Gordon Life Science Institute, Boston, United States of America

***Corresponding author:** Kuo-Chen Chou, Gordon Life Science Institute, Boston, Massachusetts 02478, United States of America

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Abstract

In this short review paper, the significant and profound impacts of the enzyme diffusion-controlled reactions have been briefly presented with crystal clear convincingness.

Keywords: Enzyme fast reactions; Upper limit; Spatial factor; Force field factor; Active site; Substrate; Role of the main protein

Short Communication

About 47 years ago a very important paper on the rate of diffusion-controlled reactions of enzyme [1] was published. According to its deduction, the upper limit of enzyme-substrate reaction is 10^{10} /Msec, which is one order of magnitude higher than the conventional estimation by Manfred Eigen [2], who won the 1967 Nobel Prize in Chemistry for the work on measuring fast chemical reactions [2]. The upper limit has been confirmed by a series of follow-up studies [3-10]. It is indeed very significant and profound for such a breakthrough or revolution in enzyme fast reaction. Particularly, it has also been supported by the eight masterpiece papers of the then Chairman of the Nobel Prize Committee [7, 8, 11-16].

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