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Environment-induced conformational and functional changes of L-2-haloacid dehalogenasesYayue Wang^{1,2}¹Chinese Academy of Sciences, China²University of Chinese Academy of Sciences, China

Enzymes are widely used as biocatalysts in various important industrial processes because of their unique features such as substrate specificity, rate acceleration, regio-, chemo-, and stereoselectivity. Understanding the environmental effects on the structure-function relationship of enzyme is significant for evaluating the enzymatic activity during application. Up to now, L-2-Haloacid dehalogenases have been highly studied for the biochemical and structural characterization, however, no information was available regarding environmental effects on the structure-function relationship. Here, circular dichroism spectroscopy (CD) was used to investigate the correlation between changes on the conformation and the function of L-2-haloacid dehalogenase (HadL AJ1) from the *P. aeruginosa* induced by the environmental factors. Decreased α -helix and increased β -sheet contents were observed in the structure of HadL AJ1 along with activity losses caused by pH, temperature and inhibitors. Regardless of which factor above-mentioned existed, more than 65.0% of HadL AJ1 activity could be remained if its α -helix content was over 12.0%. The maintenance of α -helical structure in HadL AJ1 was indispensable to its catalysis, while β -sheet increase restricts its activity. This study revealed the variation of enzymatic activity due to environmental conditions resulting in structural changes monitored by CD, which contributed to rational modification and was instructive for predicting changes of the enzymatic activity during application.

Biography

Yayue Wang is a PhD candidate in Dalian Institute of Chemical Physics of Chinese Academy of Sciences, under the supervisor of Dr. Song Xue. Her project is about characterization of haloacid dehalogenases, focusing on its structure-function relationship.

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