

Hydrolysis of Lecithin by PLA₂ in Model Bile

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Phospholipase A₂(PLA₂) is a small, stereoselective, calcium-dependent enzyme that hydrolyzes the sn-2ester linkage of phosphatidylcholine. Several reports have suggested that the phospholipases play a role in the pathophysiology of biliary disorders. Phospholipase A₂ is the most abundant phospholipase in bile. It catalyzes the hydrolysis of phosphatidylcholine (PC) into lysolecithin and free fatty acids (FFAs), both of which have been identified in abnormal bile such as that from patients with gallbladder inflammation or anomalous pancreaticobiliary ductal junction. In present work, model bile that consists of cholesterol, bile salts and lecithin has been prepared and a UV-Vis spectroscopy method has been established to study the kinetics of lecithin hydrolysis by utilizing phenol red as an indicator. The concentration of free acid from hydrolysis of lecithin catalyzed by PLA₂ has been determined continuously by monitoring of the change of the absorbency with the time. The kinetics of lecithin hydrolysis by PLA₂ in the model bile and the various effect factors on the kinetics have been investigated. The results show that the velocity of the reaction increase with the concentration of PLA₂, and the specific activities of the PLA₂ in the medium decrease with increase of the concentration of PLA₂. The results also reveal that the velocity of the reaction is faster in the model bile than in the other mediums. Acknowledgment. This work was supported by the National Natural Science Foundation of China (No. 20173024, 20273032, 20473035 and 20573056) and the New Technique Foundation of Jiangsu Province, P. R. China (No. BG-2005041).