

The inhibitory activity of metal ions and their interaction with orlistat on pancreatic lipase

S. Adisakwattana^{1,2}, W. Tiravanit³, S. Yibchok-anun⁴

¹ The Lipid and Fat Sciences Research Center and The Halal Science Center, Chulalongkorn University, Thailand, 10330

² Department of Transfusion Medicine, Faculty of Allied Health Sciences, Chulalongkorn University, Thailand, 10330

³ Department of Chemistry, Faculty of Science, Chulalongkorn University, Thailand, 10330

⁴ Department of Pharmacology, Faculty of Veterinary Science, Chulalongkorn University, Thailand, 10330

Inhibition of pancreatic lipase is one of the therapeutic approaches for lipid absorption, by delaying digestion of lipid to absorbable monoglycerides and free fatty acids. Ten metal ions were investigated for the inhibitory activity of pancreatic lipase. Nickel and copper ions showed the high potent pancreatic lipase inhibitory activity among those of metal ions. However, they were less potent than orlistat which is well known pancreatic lipase inhibitor. Nickel and copper ions were a non-competitive inhibitor against pancreatic lipase and showed the additive and synergistic effect on pancreatic lipase inhibition when they combined to orlistat, respectively. The results indicated that metal ions could be a pancreatic lipase inhibitor for treatment of obesity and hyperlipidemia.

Key word: pancreatic lipase, metal ions, inhibition, non-competitive inhibition