

MEETING ABSTRACTS

COPPER WITH CHICKEN SERUM ALBUMIN SHOW STEREOSELECTIVE HYDROLYSIS OF CHIRAL PHOSPHORAMIDATES

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Chiral analogous compound of methamidophos insecticide are only poorly hydrolyzed by Ca²⁺-dependent phosphotriesterases in mammals tissues including the human serum. We reported the hydrolysis of O-hexyl O-2,5-dichlorophenyl phosphoramidate (HDCP) in chicken serum. The hydrolysis of the R-(+)-HDCP isomer is strongly increased in vitro in the presence of 30-250 µM copper. It is the opposite estereoselectivity of that showed by liver Ca²⁺-dependent activity. We name it as "antagonistic stereoselectivity". Diluted chicken serum (10 µL in 1 mL solution of 400 µM HDCP) or the equivalent amount of commercial chicken serum albumin (CSA 216 µg/mL) with 100 µM Cu²⁺, showed about 50% and 75% of R-(+)-HDCP hydrolysis after 60 and 120 min. In the same conditions other commercial serum metalloproteins with high affinity to Cu²⁺ (cuproproteins) as human serum ceruloplasmin or horse kidney metallothionein did not showed significant Cu²⁺-dependent hydrolysis. Moreover, other divalent cations (Zn²⁺, Fe²⁺, Ca²⁺, Mn²⁺ and Mg²⁺) did not showed this activation. The results confirm that the CSA is the protein responsible of "antagonistic stereoselectivity" that had been observed in the chicken serum. The effect of copper on the hydrolysis of HDCP by other animal albumins is shown in this work.

Keywords: Albumin; copper; hydrolysis; stereospecificity; phosphotriesterases; organophosphorus