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VIPAWADEE SOMAKATARIN : EFFECTS OF CADMIUM AND ZINC ON THE FUNCTIONS OF ISOLATED RAT LIVER MITOCHONDRIA. THESIS ADVISOR : ASSO.PROF. PRAKORN CHUDAPONGSE, Ph.D. 90 PP. ISBN 974-581-110-6

Cadmium (1 μM) and zinc (1-10 μM), alone or combined were found to depress state 3 and calcium-stimulated respiration of isolated rat liver mitochondria respiring with glutamate + malate as substrates. DTT or EDTA alleviated this inhibition. NADH and succinate oxidation by osmotic-shocked mitochondria were diminished by the heavy metals whereas oxidation of ascorbate + TMPD was slightly affected. Cadmium and zinc had little inhibitory effect on the DNP-activated mitochondrial ATPase activity. These results indicated that the heavy metals depressed mitochondrial functions by inhibiting the respiratory chain in the region ahead of cytochrome c. Statistical analysis showed no difference between the inhibition mediated by cadmium + zinc and zinc alone which suggested antagonistic action of zinc on cadmium. The mechanism of this antagonism is unclear at present but the participation of metallothionein biosynthesis appears very unlikely.