

## C375369 : MAJOR PHARMACOLOGY

KEY WORD : CADMIUM/ISOLATED RAT ATRIA/INOTROPIC EFFECTS/  
CHRONOTROPIC EFFECTS

SURAWUT WATANA : THE IMPROVEMENT OF NEGATIVE  
CHRONOTROPIC AND INOTROPIC EFFECTS OF ISOLATED RIGHT  
AND LEFT RAT ATRIA RECEIVING CADMIUM. THESIS ADVISOR :  
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ADVISOR : ASSO. PROF. PRAKORN CHUDAPONGSE, Ph.D., 100 pp.  
ISBN 974-581-108-4

Cadmium (40  $\mu$ M) diminished right atrial rate and left atrial force of isolated right and left rat atria by competing with calcium at calcium channel and binding with sulfhydryl group of protein. Isoproterenol, norepinephrine, epinephrine and dibutyryl c-AMP were more efficacious in reversing cadmium effect on the right atrial rate than on the left atrial force. Increasing extracellular calcium concentration produced an opposite effect compared with the four drugs above. Dithiothreitol (DTT) and cysteine improved cardiac functions in the same manner as increasing extracellular calcium concentration but the improvement was incomplete. Additional study showed that cadmium caused a large diminution of contractile force in reserpinized and tyramine - treated rat heart and DTT antagonized this effect better than the normal heart. It was also found that combinations of isoproterenol or  $\text{CaCl}_2$  with DTT in proper concentrations were effective in alleviating cardiac effects of cadmium. The additive effect of the two groups of drug produced a more complete reversal of cadmium effects.