

Project Title : Effects of ancistrotoctarine on the respiration
and ATPase activity of isolated rat liver
mitochondria

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Abstract

Ancistrotoctarine was found to possess uncoupling action on mitochondrial respiration, i.e. it induced loss of respiratory control and diminished ADP/O ratio of isolated rat liver mitochondria respiring with glutamate plus malate or succinate as substrates. This compound also activated the oligomycin- and atractyloside-sensitive mitochondrial ATPase activity. These mitochondrial effects are similar to those produced by DNP. The I_{50} values of ancistrotoctarine on respiratory stimulation and ATPase activation were 180 and 340 μg respectively. When compared with DNP, ancistrotoctarine was substantially less potent in stimulating mitochondrial respiration and ATPase activity. DTT, a sulfhydryl-protecting agent, did not significantly alter the actions of ancistrotoctarine on mitochondrial oxygen consumption and ATPase reaction. However DTNB, a sulfhydryl reagent, was found to enhance the ancistrotoctarine-stimulated ATPase but reduce the enzyme activity induced by DNP. The possible mechanisms of ancistrotoctarine actions as well as the implications of these mitochondrial effects in the pharmacological and toxicological actions of ancistrotoctarine are discussed.