Polybrominated Diphenyl Ether congener (BDE-47) affects Mitochondrial Bioenergetics.

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INTRODUCTION: Polybrominated diphenyl ethers (PBDEs) are widely used as flame retardants and have been detected in human blood, adipose tissue, breast milk and animal wildlife due to their chemical, physical, bio-accumulative properties and their high resistance in the environment. Many studies have reported liver toxicity related to exposure to PBDEs. As toxic effects are generally associated with mitochondrial dysfunction, in the present study, we investigated the toxicity of BDE-47 in isolated rat liver mitochondria. MATERIAL AND METHODS: Mitochondria were isolated by differential centrifugation and the amount of protein used was determined by the Biuret method. BDE-47 congener was evaluated in concentrations ranging from 0.1 to 50 µM. Mitochondrial membrane potential, calcium release and mitochondrial swelling were evaluated. RESULTS AND DISCUSSION: The BDE-47 (25 and 50 µM) interferes with oxidative phosphorylation and caused dissipation of mitochondrial membrane potential, leading to an electrochemical disequilibrium. The BDE-47 also affected calcium homeostasis causing calcium efflux and inducing mitochondrial swelling. CONCLUSION: BDE-47 impairs rat liver mitochondria and can lead to a cell death.

keyword: mitochondria, PBDE, BDE-47
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