

Multiple Metabolite-Multiple Target (MMMT) Hypothesis of Chemical Cytotoxicity

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Toxicology is the study of the adverse effects of chemicals on living organisms, especially humans. Since the basic building block of organisms is the cell, all toxicological researches ultimately address the question, "How do chemicals injure or kill the cell?"

The purpose of this paper is to present a new theory of chemical cytotoxicity, called the multiple metabolite-multiple target (MMMT) hypothesis (Ji, 1989), that has been developed during the past several years based primarily on the experimental data on acetaminophen hepatotoxicity (for a recent review see Ji, 1987) and on the cellular communication theory which forms an integral part on the new theory of biology referred to as "biocybernetics" proposed recently (Ji, 1991a). This new toxicological theory appears to provide a more realistic theoretical framework for understanding the fundamental mechanisms of chemical-induced cell injuries than the currently dominant alternative theory, the covalent binding hypothesis, formulated almost twenty years ago (Mitchell et al., 1973a; Jollow et al., 1973; Potter et al., 1973; Mitchell et al., 1973b; Potter et al., 1974; Jollow et al., 1974).