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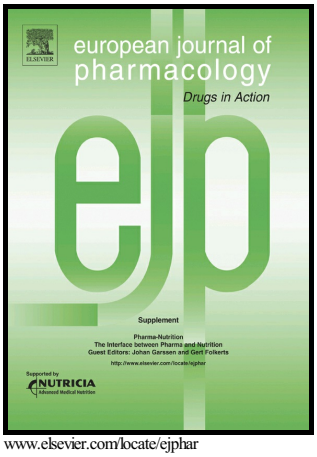

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Title: The Role of Mitochondria in Methamphetamine-induced inhibitory effects on osteogenesis of Mesenchymal Stem Cells

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Abstract

Methamphetamine (METH) abuse causes significant physical, psychological, and social concerns. Therefore, in this study, we investigated its effects on osteogenic differentiation of mesenchymal stem cells (MSCs). We found that METH dose-dependently affected MSCs viability. Upon osteogenic induction, the 3 and 30 μmol/l METH dosages without deleterious effects on MSCs viability resulted in the down-regulation of osteoblastic marker genes (Alp, Bglap, and Runx2), suppression of the protein expression of RUNX2, and decreased ALP activity and mineralization ability. Mitochondria are essential during osteogenesis of MSCs. Our analysis on mitochondrial function revealed that METH decreased ATP production, suppressed the oxygen consumption rate, and depolarized the mitochondrial membrane potential, but it had no significant effects on the protein expression of the five complexes on