

Thesis Title	The Effect of Pseudoephedrine, a Potential	
Drug	of Addiction, on the Expression of c-Fos	
	Protein in Rat Brain	
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Abstract

Pseudoephedrine is a diastereomer of ephedrine. It is currently prescribed for cold remedies as nasal decongestants and bronchodilators. Previous results have shown that pseudoephedrine increases dopamine levels in mesolimbic and nigrostriatal pathways. It is well known that drug of abuse such as amphetamine and cocaine have similar effects and that they additionally induce immediate early genes (IEG_s) expression in these specific pathways. In this work it was investigated whether pseudoephedrine could induce effects on IEG expression similar to those induced by amphetamine. The levels of IEG expression induced by pseudoephedrine was evaluated by measurement of c-Fos protein in the nucleus accumbens and striatum, terminal areas of mesolimbic and nigrostriatal pathways respectively. By using polyclonal antibodies against c-Fos protein in both Western blot assay and in confocal immunocytochemistry, pseudoephedrine-induced c-Fos expression in nucleus accumbens and striatum of male Sprague Dawley rats was demonstrated. The dependence on pseudoephedrine pattern of c-Fos expression was transient and dose-

dependent manner. Maximal c-Fos activation was observed at 90-120 minutes following 40 mg/kg BW pseudoephedrine (i.p.). The pseudoephedrine-induced elevation of c-Fos was inhibited by preinjection of 0.5 mg/kg BW SCH 23390, a specific D₁ dopamine receptor antagonist. This finding is consistent with the hypothesis that, like amphetamine and cocaine, pseudoephedrine exerts its action via elevation of dopamine levels in nucleus accumbens and striatum. Chronic exposure to pseudoephedrine reduced the c-Fos response to acute pseudoephedrine treatment suggesting that tolerance to pseudopamine could develop in potential abusers.

Further behavioural and biochemical studies are necessary to investigate whether pseudoephedrine, at the doses that it induces c-Fos, could also have psychostimulant activity.