



## Benzodiazepine/GABA<sub>A</sub> receptors are involved in magnesium-induced anxiolytic-like behavior in mice

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### Abstract:

Behavioral studies have suggested an involvement of the glutamate pathway in the mechanism of action of anxiolytic drugs, including the NMDA receptor complex. It was shown that magnesium, an NMDA receptor inhibitor, exhibited anxiolytic-like activity in the elevated plus-maze test in mice. The purpose of the present study was to examine interaction between magnesium and benzodiazepine/GABA<sub>A</sub> receptors in producing anxiolytic-like activity. We examined behavior of mice treated with magnesium and benzodiazepine/GABA<sub>A</sub> receptor ligands, in the elevated plus maze. The anxiolytic-like effect of magnesium (20 mg/kg) was antagonized by flumazenil (10 mg/kg) (benzodiazepine receptor antagonist) while combined treatment with the non-effective doses of magnesium (10 mg/kg) and benzodiazepines (diazepam (0.5 mg/kg) or chlordiazepoxide (2 mg/kg)) produced synergistic interaction (increased time in open arms and number of open arm entries) in this test. The obtained data indicate that benzodiazepine receptors are involved in the anxiolytic-like effects of magnesium.

### Key words:

magnesium, flumazenil, chlordiazepoxide, diazepam, anxiety, elevated plus-maze, mice

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