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Research paper

The involvement of NMDA receptor/NO/cGMP pathway in the antidepressant like effects of baclofen in mouse force swimming test

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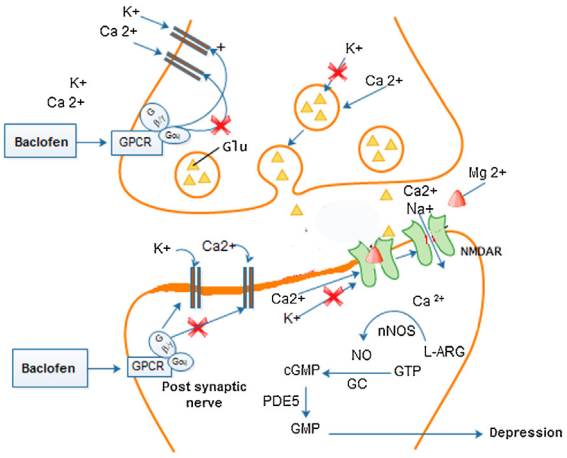
HIGHLIGHTS

- Baclofen has an anti-depressant like effect in forced swimming test.
- This effect increased by inhibition of nitric oxide production.
- This effect increased by NMDA receptor antagonist.
- This effect decreased by PDE5 inhibition.
- The antidepressant-like action of baclofen mediated by NMDA receptors and NO-GMP pathway in forced swimming test

GRAPHICAL ABSTRACT



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ABSTRACT

In the current study, the involvement of *N*-methyl-D-aspartate receptor (NMDAR) and nitric oxide (NO)/cyclic guanosine monophosphate (cGMP) system in the antidepressant-like effects of baclofen was evaluated by using animal model in forced swimming test. Followed by an open field test for the evaluation of locomotor activity, the immobility time for mice in force swimming test was recorded. Only the last four min was analyzed. Administration of Baclofen (0.5 and 1 mg/kg, i.p.) reduced the immobility interval in the FST. Prior administration of L-arginine (750 mg/kg, i.p.,) a nitric oxide synthase substrate or sildenafil (5 mg/kg, i.p.) a phosphodiesterase 5 into mice suppressed the antidepressant-like activity of baclofen (1 mg/kg, i.p.).Co-treatment of 7-nitroindazole (50 mg/kg, i.p.,) an inhibitor of neuronal nitric oxide synthase, L-NAME (10 mg/kg, i.p.,) a non-specific inhibitor of nitric oxide synthase or MK-801 (0.05 mg/kg, i.p.) an NMDA receptor antagonist with subeffective dose of baclofen (0.1 mg/kg, i.p.), reduced the immobility time in the FST as compared to the drugs when used alone. Co-administrated of lower doses of MK-801 (0.01 mg/kg) or L-NAME (1 mg/kg) failed to effect immobility time however,

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