# Dopamine D1 receptor involvement in the antidepressant-like effect of allopregnanolone in the forced swimming test

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Women are more susceptible than men to major depression and may develop mood disturbances related to their reproductive cycle. Among the factors which may account for such gender difference, neurosteroids seem to play a major role. Evidence has been produced showing the involvement of neurosteroids, and in particular of allopregnanolone, both in the mechanism of action of antidepressants and in depressive-like behaviour in animal models. Previous studies performed in male subjects have shown that dopamine D1 receptor stimulation results in an antidepressant-like effect and is critical for the expression of the effect of antidepressant drugs in the forced swimming model of depression. In the present study we examined, in Sprague-Dawley female rats, the effect of the dopamine D1 receptor antagonist SCH 23390 (0.01 and 0.025 mg/kg) on the antidepressant-like effect of allopregnanolone (2 mg/kg) in the forced swimming test. Since in preliminary experiments we failed to show in this strain of rats any difference in this test related to the phase of oestrous cycle both in basal conditions and after allopregnanolone administration, the subjects were tested regardless of their oestrus cycle phase. Allopregnanolone resulted in an increased swimming behaviour, interpreted as an antidepressant-like effect, which was prevented by SCH 233390. These results suggest an involvement of dopamine D1 receptors in the mechanism of action of allopregnanolone, and are consistent with the observation that allopregnanolone increases dopamine release in the nucleus accumbens, an event which is critical in the mechanism of antidepressant effect in this test.