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Short communication

Involvement of NMDA receptors in the antidepressant-like action of adenosine

Manuella P. Kaster[1,3], Daniele G. Machado[1], Adair R.S. Santos[2], Ana Lúcia S. Rodrigues[1]

[1]Departamento de Bioquímica, [2]Laboratório de Neurobiologia da Dor e da Inflamação, Departamento de Ciências Fisiológicas, Centro de Ciências Biológicas, Universidade Federal de Santa Catarina, Florianópolis, SC 88040-900, Brazil

[3]Laboratório de Neurociências Clínicas, Centro de Ciências da Vida e da Saúde, Universidade Católica de Pelotas, Pelotas, RS, 96010-280, Brazil

Correspondence: Manuella P. Kaster, e-mail: manu.kaster@gmail.com

Abstract:
Background and Method: In this work, the contribution of NMDA receptors to the antidepressant-like effect of adenosine in the forced swimming test (FST) was investigated.
Results: The pretreatment of mice with NMDA or D-serine was able to prevent the anti-immobility effect of either adenosine or MK-801 in the FST. In addition, the administration of a sub-effective dose of adenosine produced a synergistic effect with sub-effective doses of MK-801, ketamine and zinc chloride. Moreover, the immobility time of the mice treated with active doses of adenosine or N^6-cyclohexyladenosine (CHA) plus MK-801 was not significantly different from that obtained with adenosine, CHA and MK-801 alone; by contrast, the combination between active doses of adenosine and CHA plus an active dose of the tricyclic antidepressant imipramine produced a greater effect in the FST than the administration of either drug alone.
Conclusion: Together, the results suggest that the effect of adenosine in the FST is likely dependent on the inhibition of NMDA receptors mediated by the activation of adenosine A_1 receptors.

Key words:
adenosine, forced swimming test, NMDA receptors, adenosine A_1 receptors