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Abstract

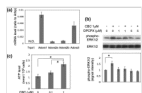
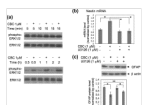
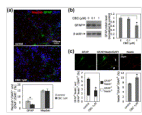
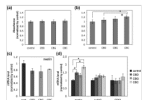
Keywords

1. Introduction
2. Experimental procedures
3. Results
4. Discussion

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References

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Rapid communication

The effect of cannabichromene on adult neural stem/progenitor cells

Noriko Shinjyo, Vincenzo Di Marzo

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Abstract

Apart from the psychotropic compound Δ^9 -tetrahydrocannabinol (THC), evidence suggests that other non-psychotropic phytocannabinoids are also of potential clinical use. This study aimed at elucidating the effect of major non-THC phytocannabinoids on the fate of adult neural stem progenitor cells (NSPCs), which are an essential component of brain function in health as well as in pathology. We tested three compounds: cannabidiol, cannabigerol, and cannabichromene (CBC), and found that CBC has a positive effect on the viability of mouse NSPCs during differentiation in vitro. The expression of NSPC and astrocyte markers nestin and Glial fibrillary acidic protein (GFAP), respectively, was up- and down-regulated, respectively. CBC stimulated ERK1/2 phosphorylation; however, this effect had a slower onset in comparison to typical MAPK stimulation. A MEK inhibitor, U0126, antagonized the up-regulation of nestin but not the down-regulation of GFAP. Based on a previous report, we studied the potential involvement of the adenosine A1 receptor in the effect of CBC on these cells and found that the selective adenosine A1 receptor antagonist, DPCPX, counteracted both ERK1/2 phosphorylation and up-regulation of nestin by CBC, indicating that also adenosine is involved in these effects of CBC, but possibly not in CBC inhibitory effect on GFAP expression. Next, we measured ATP levels as an equilibrium marker of adenosine and found higher ATP levels during differentiation of NSPCs in the presence of CBC. Taken together, our results suggest that CBC raises the viability of NSPCs while inhibiting their differentiation into astroglia, possibly through up-regulation of ATP and adenosine signalling.

Keywords

Cannabinoids; Stem cells; Adult; ATP; Adenosine

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