BMC Pharmacology

Meeting abstract

P2 receptor-mediated modulation of noradrenaline release by electrical field stimulation and ischemic conditions in superfused rat hippocampus slices

Cecília Csölle, Attila Heinrich and Beáta Sperlágh*

Address: Laboratory of Molecular Pharmacology, Institute of Experimental Medicine, Hungarian Academy of Sciences, Budapest, Hungary

Email: Beáta Sperlágh* - sperlagh@koki.hu

* Corresponding author

from 13th Scientific Symposium of the Austrian Pharmacological Society (APHAR). Joint Meeting with the Austrian Society of Toxicology (ASTOX) and the Hungarian Society for Experimental and Clinical Pharmacology (MFT)
Vienna, Austria. 22–24 November 2007

Published: 14 November 2007

BMC Pharmacology 2007, **7**(Suppl 2):A35 doi:10.1186/1471-2210-7-S2-A35

This abstract is available from: http://www.biomedcentral.com/1471-2210/7/S2/A35

In this study the regulation of the release of noradrenaline by P2 receptors was investigated in hippocampus slices preincubated with [^{3}H]NA. Electrical field stimulation (EFS; 2 Hz, 240 shock, 1 ms) enhanced the release of noradrenaline in a $[Ca]_o$-dependent manner. In contrast, the excess release in response to ischemic-like conditions (combined oxygen and glucose deprivation) was $[Ca]_o$-independent. The Na^+ channel blocker tetrodotoxin (1–3 μM) abolished both EFS-evoked and in vitro ischemia-evoked release of tritium. The P2 receptor agonists ATP, ADP and 2-MeSADP concentration-dependently decreased the tritium overflow with the potency order of ADP > 2-MeSADP > ATP. The inhibition by ATP (300 μM) was prevented by the P2 receptor antagonist PPADS (30 μM), by the $P2Y_1$ receptor antagonist MRS2179 (10 μM) and by the $P2Y_{12/13}$ receptor antagonist 2-MeSAMP (10 μM). Under ischemic-like conditions the $P2X_1$ receptor antagonist PPNDS (1 μM) inhibited the outflow of [^{3}H]NA, whereas MRS2179 (10 μM) significantly increased the tritium outflow. PPADS and 2-MeSAMP did not affect ischemia-evoked [^{3}H]NA efflux. RT-PCR analysis revealed that mRNA encoding $P2Y_{12}$ and $P2Y_{13}$ receptor subunits were expressed in the brainstem including locus coeruleus. The pharmacological profile of the underlying receptor subtype resembles the $P2Y_1$ and $P2Y_{13}$ receptor phenotype, and the endogenous activation of $P2X_1$ and $P2Y_1$ receptors contribute to the modulation of noradrenaline efflux upon ischemic-like conditions.