Prostaglandin E_2 increases expression of mRNA for cyclooxygenase-2 and microsomal prostaglandin E synthase-1 in microglia.

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Prostaglandin E_2 (PGE_2) plays an important role in modulating microglial function. In the present study, we have found that PGE_2 increases expression of mRNA for cyclooxygenase-2 (COX-2) and microsomal prostaglandin E synthase-1 (mPGES-1), which are involved in PGE_2 synthase in cultured rat microglia.

COX-2 and mPGES-1 mRNA levels were increased by PGE_2 at 10^{-6} M for 3 h in microglia. The increase of these mRNA levels was inhibited by PF-04418948 (EP_2 antagonist), but not by ONO-8713 (EP_1 antagonist), ONO-AE3 -240 (EP_3 antagonist), or ONO-AE3-208 (EP_4 antagonist) at 10^{-6} M. In addition, ONO-AE1-259-01 (EP_2 agonist), also increased COX-2 and mPGES-1 mRNA levels in a dose dependent manner, and these mRNA levels were not affected by ONO-DI-004 (EP_1 agonist), ONO-AE-248 (EP_3 agonist), or ONO-AE1-329 (EP_4 agonist) at 10^{-6} M. Moreover, PGE_2 at 10^{-6} M for 3 h decreased expression of mRNA for microsomal prostaglandin E synthase-2, and did not affect expression of mRNA levels for cyclooxygenase-1 or cytosolic prostaglandin E synthase, which are also involved in PGE_2 synthase.

Therefore, activation of EP_2 receptor results in the increase of COX-2 and mPGES-1 mRNA levels in microglia.