Expression Patterns of Kinin-B2, Muscarinic Acetylcholine and Purinergic P2X Receptors during Mouse Encephalic Development

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A previous study of our laboratory has demonstrated the crucial role of kinin-B2 receptors in neuronal differentiation using P19 embryonic carcinoma cells as *in vitro* model (Martins et al. J. Biol. Chem. 280:19576, 2005). This was observed because the gene and protein expression of kinin-B2 expression increased together with bradykinin secretion into the culture medium after induction of neuronal differentiation. Moreover, selective B2 receptor inhibition with HOE-140 compromised terminal differentiation of the P19 cells to neurons, decreasing the expression and functionality of the muscarinic acetylcholine receptors and indicating a probable cross-talking among these receptors during the neuronal differentiation process. Furthermore, work of our group has shown the participation and the differential expression of several types of metabotropic (muscarinic, kinin-B2 and purinergic P2Y) and ionotropic (nicotinic and purinergic P2X) receptors in neuronal differentiation *in vitro* (Resende *et al*. 2008 a,b Exp. Cell Research 314:1429, 2008a; Int J Dev Neurosci. 26:763, 2008b). We now study the mouse encephalic development as a complementary model in order to verify whether the results obtained for in vitro differentiation reflect processes encountered during neuronal development. We have used in situ hybridization and RT-PCR techniques for studying gene expression during mouse brain development. We report the differential expression of M2-M3 muscarinic, P2X2-P2X6 purinergic and kinin-B2 receptors in critical periods of the developing embryo and in the adult mouse. The in situ hybridization experiments provide us with a spatial and temporal picture of this process.