

AB059. Expression patterns of CB1R, NAPE-PLD, and FAAH in the primary visual cortex of vervet monkeys

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Background: The expression, localization, and function of the endocannabinoid system has been well characterized in recent years in the monkey retina and in the primary thalamic relay, the lateral geniculate nucleus (dLGN). Few data are available on cortical recipients' structures of the dLGN, namely the primary visual cortex (V1). The goal of this study is to characterize the expression and localization of the metabotropic cannabinoid receptor type 1 (CB1R), the synthesizing enzyme N-acyl phosphatidyl-ethanolamine phospholipase D (NAPE-PLD), and the degradation enzyme fatty acid amide hydrolase (FAAH) in the vervet monkey area V1.

Methods: Using Western blots and immunohistochemistry, we investigated the expression patterns of CB1R, NAPE-PLD, and FAAH in the vervet monkey primary visual cortex.

Results: CB1R, NAPE-PLD, and FAAH were expressed in the primary visual cortex throughout the rostro-caudal axis. CB1R showed very low levels of staining in cortical layer 4, with higher expressions in all other cortical layers, especially layer 1. NAPE-PLD and FAAH expressions were highest in layers 1, 2 and 3, and lowest in layer 4.

Conclusions: Interestingly enough, CB1R was very low in layer 4 of V1 in comparison to the other cortical layers. The visual information coming from the dLGN and entering layer 4Calpha (magnocellular cells) and 4Cbeta (parvocellular cells) may be therefore modulated by the higher expression levels of CB1R in cortical layers 2 and 3 on the way to the dorsal and ventral visual streams. This is further supported by the higher expression of NAPE-PLD and FAAH in the outer cortical layers. These data indicate that CB1R system can influence the network of activity patterns in the visual stream after the visual information has reached area V1. These novel results provide insights for understanding the role of the endocannabinoids in the modulation of cortical visual inputs, and hence, visual perception.

Keywords: Cannabinoid receptor type 1 (CB1R); N-acyl phosphatidyl-ethanolamine phospholipase D (NAPE-PLD); fatty acid amide hydrolase (FAAH); monkey; visual cortex

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