

AB007. Expression and localization of CB1R, NAPE-PLD, and FAAH in the primary visual cortex of vervet monkeys

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Background: The goal of this study is to determine the expression and localization of the cannabinoid receptor type 1 (CB1R), the synthesizing enzyme N-acyl phosphatidylethanolamine phospholipase D (NAPE-PLD), and the degradation enzyme fatty acid amide hydrolase (FAAH) in the vervet monkey area V1 to better understand the mechanisms underlying the effects of eCB system modulation on cortical visual processing.

Methods: Using Western blots and immunohistochemistry, we investigated the laminar and cellular expression patterns of CB1R, NAPE-PLD, and FAAH across the rostrocaudal

axis of the vervet monkey (*Chlorocebus sabaeus*) primary visual cortex.

Results: CB1R, NAPE-PLD, and FAAH were expressed in V1 throughout the rostrocaudal axis. CB1R showed very low staining in layer (L) 4, with higher expression in all other layers, especially L1, followed by L2 and L3. NAPE-PLD and FAAH expression patterns were similar, but not quite as low in L4. CB1R, NAPE-PLD, and FAAH were localized in vGlut2-positive cells, representing glutamatergic projection neurons, and in somatostatin (SST)-positive cells, a class of GABAergic interneurons.

Conclusions: The low level of CB1R in L4 indicates less direct endocannabinoid modulation of V1 afferents from the dLGN, but that greater modulation may occur via the higher expression of CB1R in L2 and L3 on the way to the dorsal and ventral visual streams. This is further supported by the higher expression of NAPE-PLD and FAAH in these layers. Expression in vGlut2-positive and SST-positive cells represents a role at both glutamatergic and GABAergic neurons. These data indicate that CB1R may influence the network of activity patterns in the visual streams after the visual information has reached V1, and thus may influence visual perception.

Keywords: Cannabinoid receptor type 1 (CB1R); N-acyl phosphatidylethanolamine phospholipase D (NAPE-PLD); fatty acid amide hydrolase (FAAH); monkey; V1

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