Translational Medicine @ UniSa - ISSN 2239-9747 2019, Special Issue 1(50): 50

P30. SHEDDING LIGHT ON THE ENDOCANNABINOID SYSTEM: EFFECT OF LIGHTING CONDITIONS IN THE AQUATIC ENVIRONMENT

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The aquatic habitat poses particular challenges for photoreceptive mechanisms involving the circadian clock, because light intensity and spectrum change with depth and water quality. The endocannabinoid system shows tissue-specific diurnal changes, and is involved in circadian physiological processes (e.g. sleep, body temperature, endocrine secretions, food intake, learning, memory, locomotion). We investigated the role of light spectrum on the expression of endocannabinoid system genes in zebrafish development. RT-qPCR revealed that the expression of cnr1 and pparg receptors was reduced in green light, while that of the gpr55a receptor was significantly lower in blue, green and red. Significant reduction was found in the expression of the abhd4 synthesis enzyme and ptgs2b degradation enzyme under green light. The expression of abhd6a catabolic enzyme was reduced in green and red, while that of ptgs2a was lower in blue and green. Most changes in gene expression occur under green light. These data are integrated with mass spectrometry analysis of endocannabinoids. Green light has a negative effect on zebrafish development, causing low feeding activity, poor growth, malformations, and low survival. Larvae adapt their visual system to photic environment by altering number of cones and opsin expression in the retina, which is rich in UV and blue cones in larvae, and in green- and red-sensitive opsins in juveniles. So, green light treatment could induce lower gene expression probably because of the reduced number of red and green cones in the larval retina. Here, lighting conditions clearly influence expression levels of endocannabinoid system genes during zebrafish development.