

Do34 - Regional variation in the expression of novel opsin molecules in the primate retina

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Aim: It is known that novel photopigments / photoisomerases are expressed throughout the brain and retina of mammals. However, what remains undetermined is their distribution in primate retina, our focus here. **Methods:** Macula and peripheral retinal samples were obtained from n=3 primates (*Cynomolgus macaque*) and snap frozen. From each animal, 6 samples: macula GCL, INL, ONL and peripheral GCL, INL, ONL were micro-dissected from cryosections and RNA extracted. Quantitative PCR (qPCR) was then used to establish the regional expression profile of *OPN5* (neuropsin), *RRH* (peropsin) and *OPN3* (encephalopsin). Fixed retina (n=4) was used to determine protein localisation by immunofluorescence. **Results:** Neuropsin was expressed in all 3 retinal layers by qPCR, with macula levels twice those found in the periphery. Peropsin was mainly expressed in the GCL and INL by qPCR, with reductions of ~50% and ~20% found in the ONL and peripheral INL respectively. Immunofluorescence for peropsin revealed expression in GFAP expressing astrocytes. Encephalopsin was mainly expressed in the GCL and ONL of macula and peripheral retina by qPCR, with a marked reduction (14x) in the expression of this opsin in macula ONL. Immunofluorescence for encephalopsin stained retinal ganglion cells and cone photoreceptors, with significantly reduced expression of encephalopsin in Sub-foveal cones. **Conclusions:** Here we report regional variations in the distribution of 3 novel opsin molecules in the primate retina, which imply some form of localised functional specialisation. Most interestingly, encephalopsin expression in cones and its down-regulation in sub-foveal cones suggest a functional role for this opsin in primate vision.