

Evolution and spectral tuning of vertebrate visual pigments

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Adaptations of the visual system have occurred throughout vertebrate evolution and frequently involve changes in the frequency of the different photoreceptor classes in the retina combined with changes in the spectral sensitivity of the visual pigments that they contain. These adaptations particularly affect the different cone classes. The driving forces behind these changes are generally either the quantity or quality of environmental light or the demands of a particular visual task. Examples that will be discussed will be taken from our recent studies and will include (1) the loss of cone classes and shifts in spectral sensitivity found in nocturnal, fossorial and deep-water species, and (2) the multiple occurrences of loss of UV-sensitivity in vertebrate evolution.