



Physiological characteristics of macula for forming binocular vision

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Introduction

Morphology and physiology of the macula Cones within the area unit are of 3 colors: blue spectrum, green and red. The foveolar consists from solely red and inexperienced cones. navy blue cones area unit found within the rings placed round the foveolar, with an outdoor diameter of roughly four.5 mm. The density of blue cones at intervals this ring has the very best concentration. This ring apparently plays a number one role within the physiological mechanism of aiming the attention for the very best accuracy. This morph purposeful structure of the macula permits you to faithfully "aim" for the world of house even in low-light conditions once the approaching light-weight largely consists from the foremost powerful violet-blue a part of the spectrum. Chart of optical center organization in tissue layer given can assist you to raised perceive the Organization of the incoming optical signal with the functioning of the accommodation system.

Morpho- Functional Organization of Retina

In addition, there area unit horizontal cells placed within the outer layer of the tissue layer and amacrine cells placed within the inner plexiform layer, that ensures the upkeep of the horizontal linkages among all fields of excitation of cones and rods. it's important to notice that the morphological and physiological structure of macular structure differs significantly from its distant fringe. It are often schematically diagrammatic as 2 layers' model: with 2 layers of rods within the macula from every of hemispheres of the tissue layer in every eye. it's clear that these layers aren't gift, and every of the neighboring rods is connected through its own nerve fibre with completely different completely different} however adjacent neural excitation fields from different hemispheres of the tissue layer Secondary illustration of signals from a part of the cones completely different in several in numerous} hemispheres of the brain associated "Criss-Cross" with different eye retinas is a vital morphological and physiological feature of the sensory system. this enables to use parameters overlapping naso-temporal excitation fields of blue, inexperienced and red rays (BGR- rays) not only if you need acuity, however conjointly to properly steer the binocular sight to a precise purpose. most space of overlapping excitation fields of rods within the foveola can correspond to the precise binocular steering for each eyes.

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Associate in Nursing object accentuated from visual background for a lot of elaborated analysis conjointly shows that, with the gradual removing of the analyzed half from a way, the overlaying fields area unit narrowing The excitation regions at the fringe of the tissue layer area unit reducing. And in fact, the brain can provides a management command to the extraocular muscles to rotate each eyes in such thanks to maximize the world of overlap. that's necessary to get the most command amplitude. A qualitative and sensitive signal for the functioning of the whole accommodation system may be a preliminary estimate of a relative location of the BGR-bands of excitation within the macula. After all, for the simplest vision, the extent of excitation of inexperienced and red rods happiness to superimposed coaxial "layers" within the foveola ought to be maximized.

Physiological mechanism of binocular steering

We assume that a strong excitation signal from the blue cones placed at intervals the ring round the foveola may be a borderline signal of "detection" for the start of the fiduciary mechanism for a finer eye steering. it's potential to outline the circular boundary of the fixation of blue rays within the ring-sight of the macula as a mechanism for preliminary search and steering. the search and aiming mechanism once moving the fixation object from the attention One will clearly see however the binocular special "optical aim" synchronously works, whereas placed within the tissue layer of every eye within the variety of a peripheral ring round the foveolar and having the most concentration of blue rods reacting to the foremost powerful a part of the spectrum-the blue band of excitation. Such a morph purposeful structure of the macula permits reliable "aiming" even in low light-weight conditions, once the foremost powerful violet-blue a part of the spectrum is gift within the incoming light-weight. organic process choice of the blue a part of the spectrum for reliable performing at any illumination and at any time of the day suggests that, apparently, the eyes of a person and animals were originally utterly tailored to nighttime vision.

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