This is an abstract that was submitted for the 2018 ARVO Annual Meeting, held in Honolulu, Hawaii, April 29 - May 3, 2018.

CONTROL ID: 2913781
SUBMISSION ROLE: Abstract Submission

AUTHORS

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Study Group: (none)

ABSTRACT

TITLE: Optical defocus changes signaling of ganglion cells in the mouse retina
ABSTRACT BODY:
Purpose: Myopia is a substantial public health problem, affecting 33% of individuals over the age of 12 years in the United States and more than 80% people in Hong Kong. High myopia is a predisposing factor for retinal detachment, myopic retinopathy, and glaucoma, which are leading to loss of vision and blindness. Optical defocus or image blur alters eye growth and refraction. However, optical defocus's effect on retinal signaling that accounts either for emmetropization or for refractive errors has remained elusive. The research is to determine if the defocus light stimuli or image had effect on signaling of ganglion cells in mouse retina.
Methods: ON and OFF alpha ganglion cells were recording from adult C57BL/C57BL:129 wild-type or Kcng4-YFP mice. A white or mono green organic light-emitting display (OLEDXL, Olightek, China; 800 × 600-pixel resolution, 60 Hz refresh rate) was controlled by computer and was presented different spatial frequencies light bar generated by PsychoPy onto the photoreceptor layer. The intensity of the light bar will be above 100 isomerizations (R*)/rod/s in the photopic range.
Results: Dark-adapted mouse ganglion cells were recording under different light intensity to find their thresholds and intensity-response profiles. Then defocus the image was projected on the same cell to record these ON and OFF GCs light response with different Len powers. Signal/noise ration decreased with defocus light and image in ON GCs (n=4). OFF GCs (n=5) also had decreased signal/noise ratio with defocus image. Compared with clear and focused light and image, optical defocus image induced more spikes after light off in ON GCs and more spikes in Light on in OFF GCs. Different spatial frequencies can induce different ON and OFF signal/noise ratio.
Conclusions: Optical defocus changes the signaling of ON and OFF ganglion cell in the mouse retina. The process might be the first step to induce myopia development.
(No Image Selected)

DETAILS

PRESENTATION TYPE: #1 Poster, #2 Paper
CURRENT REVIEWING CODE: 2990 myopia: structure/function relationships - AP
CURRENT SECTION: Anatomy and Pathology/Oncology
Clinical Trial Registration (Abstract): No
Other Registry Site (Abstract): (none)
Registration Number (Abstract): (none)
Date Trial was Registered (MM/DD/YYYY) (Abstract): (none)

Date Trial Began (MM/DD/YYYY) (Abstract): (none)
Grant Support (Abstract): Yes
Support Detail (Abstract): The Hong Kong Polytechnic University grant: Project of Strategic Importance (1-ZE1A); 1-ZE66; G-UACF

TRAVEL GRANTS and AWARDS APPLICATIONS

AWARDS:

AFFIRMATIONS

Affirmations: Affirmation that submission of this abstract has been approved by the Principal Investigator.
Affirmations: Affirmation of compliance with ARVO's Statement for Use of Animals.
Affirmations: Affirmation to pay Annual Meeting's full registration fee.
Affirmations: Affirmation that abstract data/conclusions have not been published; not redundant with other submissions from same investigators.
Affirmations: Affirmation to reveal essential structure, novel compound elements, or identify new gene compounds.
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