

Joint Event

16th International Conference on

Alzheimers Disease & Dementia

7th International Conference on

Neurology and Psychiatry

2nd International Conference on

Neuroscience and Neurobiology

October 19-20, 2022

Webinar



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Retinal neuromodulation: Using non-image forming retinal pathways to influence mental and physical health

Problem: As new connections and functions from the retina to various brain structures continue to be discovered, the ramifications on mental and physical health in humans is unknown. For instance, in late 2021, using nanotechnology, a new retinal cell was discovered. This campana cell spans the entire thickness of retinal tissue, yet its function has yet to be uncovered. The slow retinal pathways linked with eyesight and visual processing are well-known, but the faster, Non-Image Forming pathways (NIF) are the focus of newer research. As an often overlooked part of the central nervous system, NIF pathways likely play an important role in overall mental and physical health. Unfortunately, current eye testing is geared toward the slower image-forming (eyesight) pathways. Eyeglasses are typically prescribed to sharpen central eyesight-part of the image-forming pathways, but the effects of glasses or contact lenses on the NIF pathways are only shown through anecdotal evidence.

Background: NIF pathway connections involve motor, limbic, endocrine and autonomic interactions via the retina-collicular, retino-raphe, retino-hypothalamic pathways and the Edinger-Westphal Nucleus respectively. Since eyeglasses alter the dispersion of incoming light on the retina, they can be used to selectively influence other body functions. Stimulating retinal function will affect brain reactions and responses and gene expression, shifting neurochemistry. For instance, in dim lighting, glutamatergic neurons are firing. In bright light, the glutamate release is suppressed.

Recent research is demonstrating that retinal changes occur BEFORE cortical structures. The early retinal changes have been shown in schizophrenia, bipolar disorder, Parkinson's, Alzheimer's and Multiple Sclerosis. Retinal vasculature has been evaluated for decades to assess diabetes and hypertension, but with the invention of updated imaging techniques (such as ocular coherence tomography) the optic nerve has been more thoroughly screened. This presentation will review new retinal processing research and discuss how NIF pathways affect retinal neuromodulation.

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Biography

Deborah Zelinsky, O.D. is an optometrist who has gained world-wide recognition for her innovative work using individually customized eyeglasses to affect the frequency and direction of light dispersed on the retina. The effects can be used to influence neural pathways. Specifically, this can affect awareness of perceived external visual and auditory space as well as internal physiological processes. She is the founder of the Mind-Eye Connection, now expanded into the Mind-Eye Institute. The Institute is connecting optometry with neuroscience and evaluates patients with a variety of symptoms, ranging from autism, ADD/ADHS, dyslexia and traumatic brain injury. In addition to her work with the Mind-Eye Institute, She is a fellow in both the College of Optometrists in Vision Development and the Neuro-Optometric Rehabilitation Association, and a board member on both the Society for Brain Mapping and Therapeutics and California Brainwaves.

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