FACTS ABOUT EYE AND BRAIN

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LVPEI So that all may see
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Altered visual cortex excitatory/inhibitory ratio following transient congenital visual deprivation in humans

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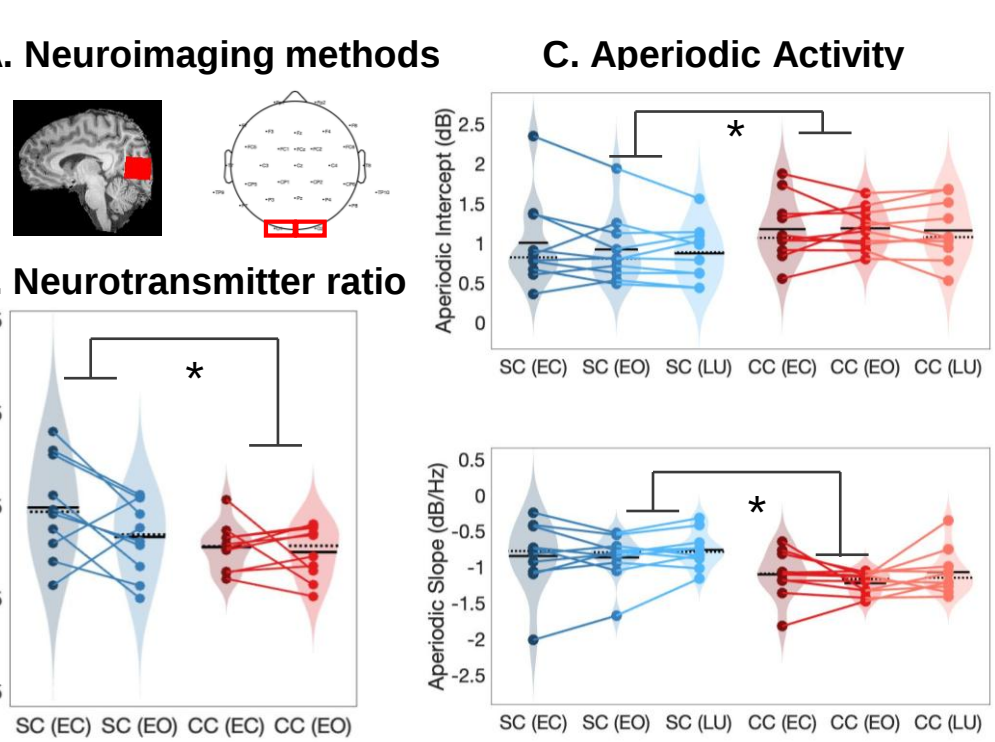

A. (Left) Magnetic resonance spectroscopy voxel and (right) electrodes for visual cortex electrophysiological measurements. B. Glutamate/Glutamine (Glx) to Gamma-aminobutyric acid (GABA+) concentration ratio obtained from visual cortex of sighted control (SC) and congenital cataract reversal (CC) individuals during rest with their eyes open (EO) and eyes closed (EC). C. Aperiodic intercept (top) and slope (bottom) obtained from the same SC and CC individuals with EO, EC and while viewing flickering stimuli (LU).

Individuals with **reversed dense bilateral congenital cataracts (CC**, n = 10) showed a reduction in the ratio~~n~~ of their visual cortex excitatory (Glx) and inhibitory (GABA+) neurotransmitter concentrations compared to typically sighted controls (SC, n = 10), as quantified by Magnetic Resonance Spectroscopy (MRS) at rest with participants' eyes open (EO) and eyes closed (EC). The same CC individuals exhibited a steeper aperiodic slope and a higher aperiodic intercept of the electroencephalogram (EEG) activity over occipital electrodes, across EO, EC and visual stimulation (LU). These **simultaneous changes in neurotransmitter (MRS) and aperiodic neurophysiological activity (EEG) measures** suggest a permanent change in visual cortex excitability which might be contributing to incomplete behavioral recovery.

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