

## 3D Electrode Carrier and its Implications on Retinal Implants

**Authors :** Diego Luján Villarreal

**Abstract :** Retinal prosthetic devices aim to repair some vision in visual impairment patients by stimulating electrically neural cells in the visual system. In this study, the 3D linear electrode carrier is presented. A simulation framework was developed by placing the 3D carrier 1 mm away from the fovea center at the highest-density cell. Cell stimulation is verified in COMSOL Multiphysics by developing a 3D computational model which includes the relevant retinal interface elements and dynamics of the voltage-gated ionic channels. Current distribution resulting from low threshold amplitudes produces a small volume equivalent to the volume confined by individual cells at the highest-density cell using small-sized electrodes. Delicate retinal tissue is protected by excessive charge density

**Keywords :** retinal prosthetic devices, visual devices, retinal implants., visual prosthetic devices

**Conference Title :** ICBE 2023 : International Conference on Biomedical Engineering

**Conference Location :** Barcelona, Spain

**Conference Dates :** May 22-23, 2023