

## Feasibility Assessment

My lab at the Buck Institute has the relevant expertise to develop the proposed solution to the 3D retinal organoid challenge. I have been working of protocols to generate various retinal neuronal cell types as well as RPE cells for over 14 years. In addition, we have developed significant expertise in biomaterial design and scaffold engineering over the last few years. This came out of work sponsored by California Institute for Regenerative Medicine (CIRM). The funding allowed us to work with Dr. Tejal Desai's lab at UCSF (Chair, Dept of BioE) on generation of patterned 3D scaffolds for the retina and this solution in an evolution from that work. If we run into any significant issues, we will add additional bioengineering and biomaterial expertise to the team.

We are also setup to carry out the various studies in the proposal. The various biomaterials are readily available from a number of sources including a number of bioprinting companies. For evaluation, TEM studies will be carried out at the Buck Institute's Imaging core. The SEM studies will be varied out at Stanford Imaging Facility with which we have a working relationship already. For 3D printing, we have purchased the Cellink Inkredible+ printer. If this turns out to be insufficient for high-throughput applications, we will work with Biobots, Inc on their customizable bioprinter. For the functional assessment of light-sensitivity, we have an *ex vivo* ERG setup developed by Ocuscience, Inc which allows light-response recordings from freshly isolated mammalian retinas. We will adapt the setup to test light-sensitivity of the 3D organoids.

Timelines:

