NAEVR/AEVR
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EDUCATION

AEVR Highlights Latest in Clinical Practice and Research for Patients in its *International Age-Related Macular Degeneration (AMD) Awareness Week 2021* Congressional Briefing

RESEARCH SAVING SIGHT, RESTORING VISION
an Initiative of the
Alliance for Eye and Vision Research

AEVR's virtual global *International AMD Awareness Week 2021* Congressional Briefing, held during *Healthy Aging Month*, highlighted the latest advances in NEI funded research—as well as that funded by private foundations and industry—which is resulting in new treatments used in clinical practice for AMD.


Amir H. Kashani, MD, PhD (Wilmer Eye Institute/Johns Hopkins University)

Amir H. Kashani, MD, PhD, an Associate Professor of Ophthalmology, discussed clinical care of AMD patients—dependent on both the stage and form of the disease. Based on NEI's *Age-Related Eye Disease Studies (AREDS/AREDS2)*, AMD is classified as Early, Intermediate, or Advanced, where all three stages can reflect the dry form of the disease (80-90 percent of incidence) and Advanced AMD also reflects the neovascular or wet form (10 percent incidence). Clinicians often diagnose the onset of AMD well before visual function is impaired using Optical Coherence Tomography (OCT) and OCT Angiography (OCTA), non-invasive imaging technologies that create three-dimensional images of the retina and can help clinicians detect near-cellular level changes in both wet and dry forms of AMD before subjects have symptoms.

Although there are several Food and Drug Administration (FDA)-approved drug treatments for the wet form of AMD, there are currently no effective treatments for dry AMD. Dr. Kashani described his work as a Principal Investigator in an embryonic stem cell-based experimental therapy funded by the California Institute for Regenerative Medicine (CIRM). He showed how a single layer of stem cell-derived Retinal Pigment Epithelium (RPE) cells—which nurture photoreceptors in the retina—is grown on a substrate and then injected into the eye to "patch" RPE degenerated in dry AMD.


Kapil Bharti, PhD (National Eye Institute)

Discussing dry AMD "patching" in even greater detail, Kapil Bharti, PhD, a Senior Investigator in the Ocular and Stem Cell Translational Research Unit, described a current first-in-human NEI clinical trial using an induced pluripotent stem cell (iPSC)-based therapy to treat dry AMD, for which he serves as Principal Investigator. The therapy takes a patient's blood cells and converts them into iPS cells, which are then programmed to become RPE cells. Those RPE cells are then injected into the eye to shore up the health of remaining photoreceptors by replacing dying RPE with a patient's own iPSC-derived RPE.

Through graphics and videos, Dr. Bharti demonstrated the process of growing the iPSC-derived RPE cells on a scaffold which are then inserted as a "patch" under the damaged retina by a specifically designed surgical tool. In initial proof-of-concept animal studies, imaging confirmed that the lab-made cells had integrated within the animal eye, while electrical responses recorded from photoreceptors "rescued" by RPE patches were closer to normal, whereas photoreceptors treated with a control empty scaffold had died.


Matt Levine (American Macular Degeneration Foundation)

After the formal presentations, Matt Levine, American Macular Degeneration Foundation's (AMDF) Director of Grants, Partnerships, and Advocacy, moderated a discussion. In introductory comments, he emphasized the importance of private foundation funding for AMD research but noted that it reflects less than ten percent of the annual amount of federal funding which is supported by the NEI.

Video of the event is on the AEVR Web site at www.eyeresearch.org.

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