Delivering on the Promise of Ophthalmic Gene Therapy for Rare Inherited Retinal Diseases

October 2024

Braydon,
RDH12 patient

Disclosures and Forward-Looking Statements

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such statements include, but are not limited to, statements concerning expectations regarding our cash runway, data from and future enrollment for our clinical trials, our pipeline of additional indications, expectations of potential growth, and our expectations regarding the acquisition of Opus Genetics. These forward-looking statements relate to us, our business prospects and our results of operations and are subject to certain risks and uncertainties posed by many factors and events that could cause our actual business, prospects and results of operations to differ materially from those anticipated by such forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those described under the heading “Risk Factors” included in our Annual Report on Form 10-K and subsequent filings with the U.S. Securities and Exchange Commission (the “SEC”). Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of this presentation. In some cases, you can identify forward-looking statements by the following words: “anticipate,” “believe,” “continue,” “could,” “estimate,” “expect,” “intend,” “may,” “ongoing,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would,” or the negative of these terms, or other comparable terminology, although not all forward-looking statements contain these words. We undertake no obligation to revise any forward-looking statements in order to reflect events or circumstances that might subsequently arise. These forward-looking statements are based upon Ocuphire’s current expectations and involve assumptions that may never materialize or may prove to be incorrect. Actual results and the timing of events could differ materially from those anticipated in such forward-looking statements as a result of various risks and uncertainties, including, without limitation: the success and timing of regulatory submissions and pre-clinical and clinical trials, including enrollment and data readouts; regulatory requirements or developments; changes to or unanticipated events in connection with clinical trial designs and regulatory pathways; delays or difficulties in the enrollment of patients in clinical trials; substantial competition and rapid technological change; our development of sales and marketing infrastructure; future revenue losses and profitability; our relatively short operating history; changes in capital resource requirements; risks related to the inability of Ocuphire to obtain sufficient additional capital to continue to advance its product candidates and its preclinical programs; domestic and worldwide legislative, regulatory, political and economic developments; employee misconduct; changes in market opportunities and acceptance; reliance on third parties; future, potential product liability and securities litigation; system failures, unplanned events, or cyber incidents; the substantial number of shares subject to potential issuance associated with our Equity Line of Credit arrangement; risks that our partnership with Viatris, or our other licensing arrangements, may not facilitate the commercialization or market acceptance of Ocuphire’s product candidates; future fluctuations in the market price of our common stock; the success and timing of commercialization of any of Ocuphire’s product candidates; obtaining and maintaining Ocuphire’s intellectual property rights; and the success of mergers and acquisitions.

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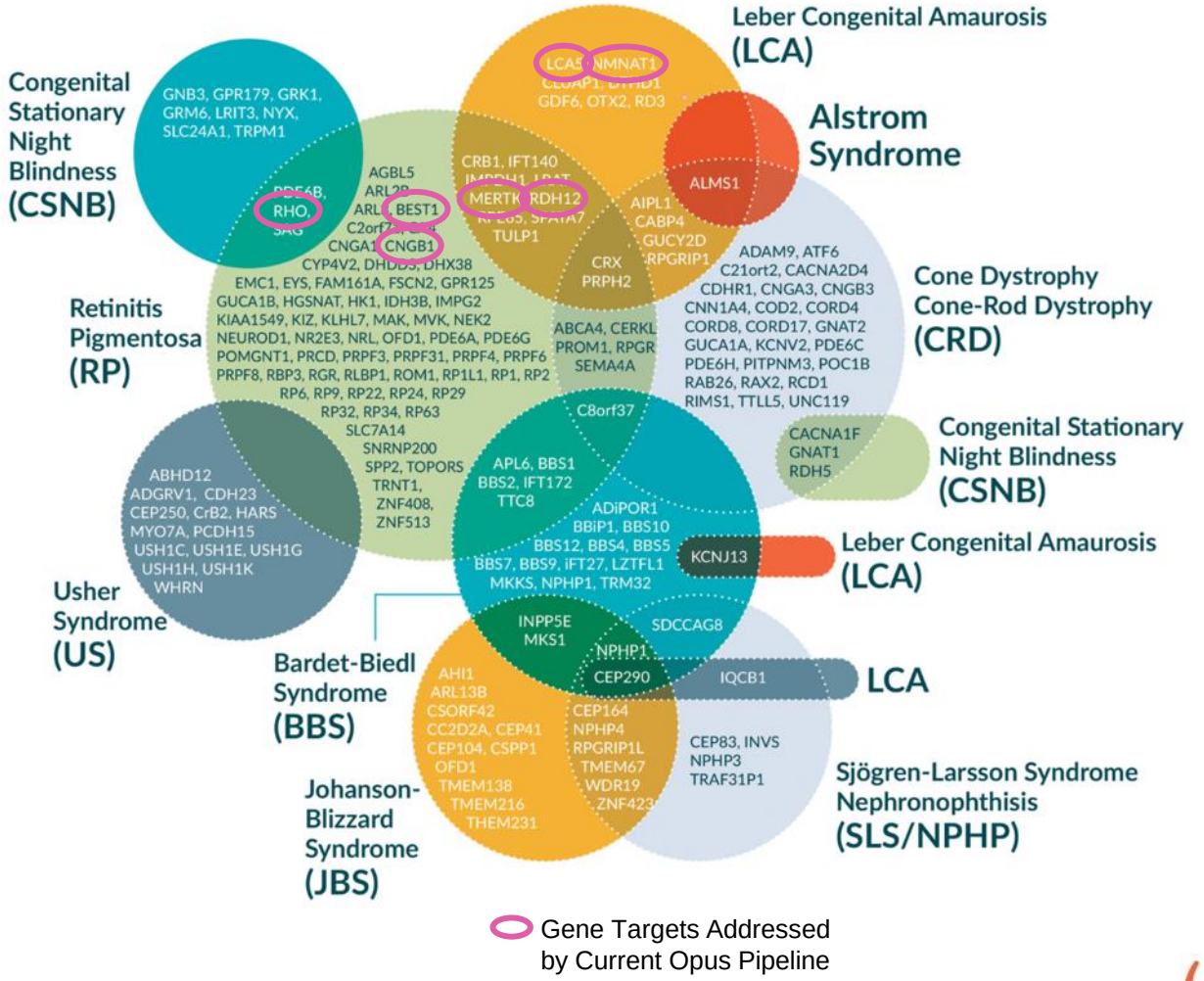
Well-Positioned to Be a Leader in Gene Therapy with the Largest Dedicated IRD Portfolio

- Over 280 genes are known to cause IRDs, which severely affect vision in more than 180,000 patients in the U.S.[1,2]
- Almost all IRDs lack treatment to halt progression and rescue vision[2]
  - Luxturna® is the only FDA-approved IRD gene therapy and targets one gene mutation[2]

Our current pipeline addresses multiple gene mutations, and our validated approach supports sustainable future growth



Luxturna® is a registered trademark of Spark Therapeutics, Inc.
AAV, adeno-associated virus; FDA, Food and Drug Administration; IRD, inherited retinal disease.

1. Retinal Information Network. RetNet data. 2024. https://retnet.org. **2.** Gong J, et al. *Clin Ophthalmol.* 2021;15:2855-2866.

Efficient IRD Pipeline with Multiple Near-Term Value Inflection Points and Expected Meaningful Cashflow from Phentolamine Franchise

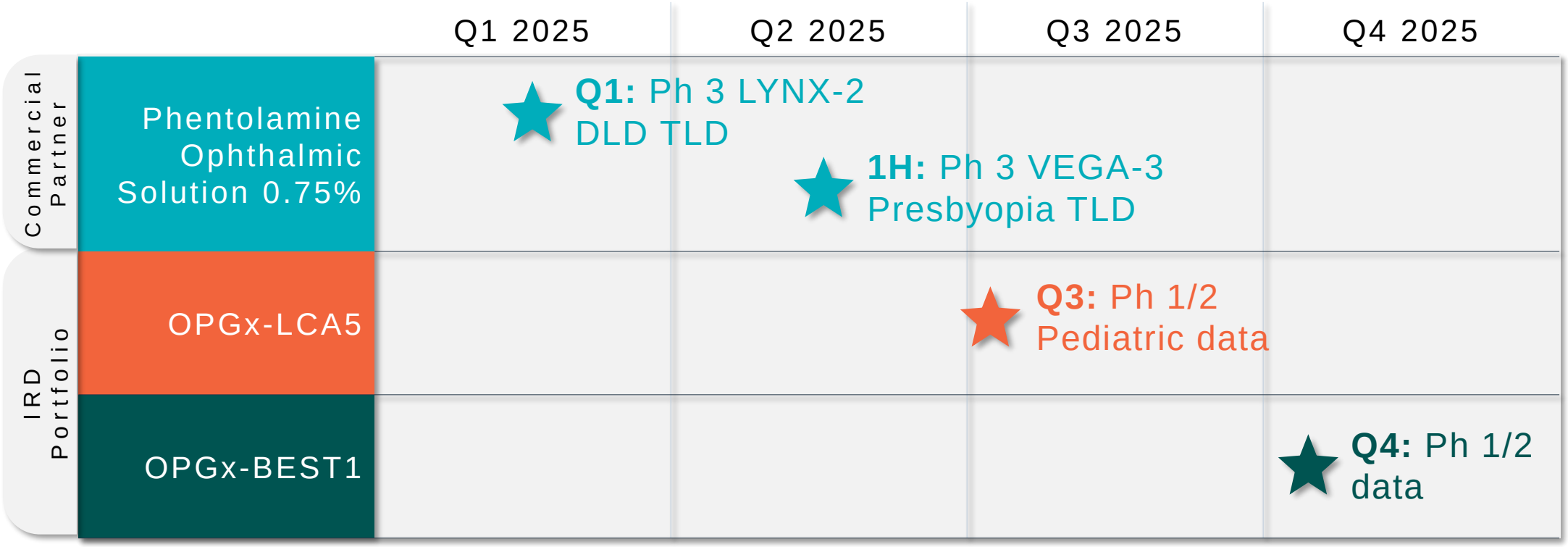
*Orphan Drug Designation and Rare Pediatric Disease Designation received from the U.S. FDA for OPGx-LCA5; All remaining candidates are eligible for Orphan Drug and Rare Pediatric Disease Designations from the FDA.

adRP, autosomal dominant retinitis pigmentosa; BEST1, bestrophin 1; CNGB1, cyclic nucleotide-gated channel β1; FDA, Food and Drug Administration; FPI, first patient in; GLP, Good Laboratory Practice; IND, Investigational New Drug; IRD, inherited retinal disease; LCA5, Leber congenital amaurosis 5; MERTK, MER proto-oncogene tyrosine kinase; NMNAT1, nicotinamide mononucleotide adenylyltransferase 1; NHP, non-human primate; RDH12, retinol dehydrogenase 12; RHO, rhodopsin; RP, retinitis pigmentosa; TLD, topline data.

1. Stone et al. *Ophthalmology.* 2017;124:1314-1331. **2.** Triangle Insights Group market research (compilation of prevalence studies), conducted August 2023.

2026 Cash Runway Extends Past Four Clinical Trial Readouts in 2025

PROJECTED TIMELINES



BEST1, bestrophin 1; DLD, dim light disturbances; IRD, inherited retinal disease; LCA5, Leber congenital amaurosis 5; TLD, topline data.

Established Technology with Clinical Proof of Concept, Efficient Development Pathway, and Significant Commercial Value

Dedicated IRD Portfolio	• AAV-based gene therapy for seven rare inherited retinal diseases • Limited competition • Support from Foundation Fighting Blindness, NIH, and FDA accelerates trial execution
Compelling OPGx-LCA5 PoC Data	• Cohort 1 of three adult patients with late-stage disease shows improvement across visual assessments in all patients, with durability through six months • First pediatric patients ready for enrollment
Well-Established Science	• AAV constructs are well-studied, with strong validation of efficacy and safety • Builds on Luxturna® technology and clinical development blueprint
Clear Development Pathway	• Expedited regulatory pathways and potential pediatric and orphan drug designations • Efficient clinical trial execution based on anticipated enrollment • OPGx-LCA5 granted Rare Pediatric Disease Designation and Orphan Drug Designation
Significant Commercial Value	• Gene therapy and rare disease therapy pricing reflects value to patients • Requires small commercial footprint and efficient R&D investment

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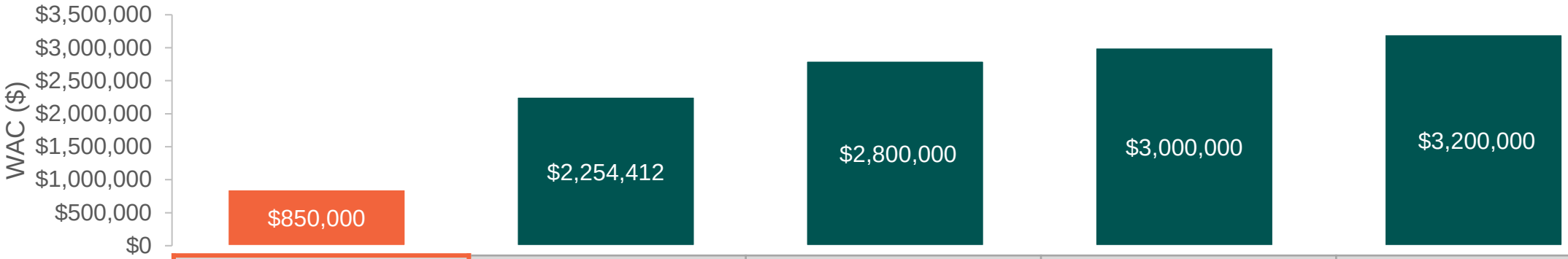
AAV, adeno-associated virus; FDA, Food and Drug Administration; IRD, inherited retinal disease; NIH, National Institutes of Health; LCA5, Leber congenital amaurosis 5; PoC, proof of concept; R&D, research and development.

Valuable Gene Therapies Create Robust Commercial Potential



Product	Luxturna®*	Zolgensma®	Zynteglo™	Skysona™	Elevidys™
Indication	Biallelic RPE65 Mutation-Associated Retinal Dystrophy	<2 years old with Spinal muscular atrophy (SMA)	β-thalassemia patients who require regular red blood cell transfusions	4-17-year-olds with Cerebral Adrenoleukodystrophy (CALD)	Ambulatory 4-5-year-olds with Duchenne Muscular Dystrophy (DMD)
Technology Type	AAV vector-based	AAV vector-based	Autologous hematopoietic stem cell-based	Autologous hematopoietic stem cell-based	AAV vector-based
Dosing Regimen	1.5 x 10^{11} vg per eye, on separate days, but no fewer than 6 days apart	1.1 × 10^{14} vg per kg of body weight, IV over 60 minutes	5.0 × 10^{6} CD34+ cells per kg of body weight, each bag via IV in <30 minutes	5.0 × 10^{6} CD34+ cells per kg of body weight minimum single dose	1.33 ×10^{14} vg per kg of body weight, IV over 1-2 hours (<10mL/kg/hr)
ROA	Subretinal	Intravenous	Intravenous	Intravenous	Intravenous
Approval Date	December 2017	May 2019	August 2022	September 2022	June 2023
Patent Expiry	June 2025	December 2029	December 2029	December 2032	N/A

Gene therapy is a **one-time treatment** for the lifetime of the patient

*WAC for dosing both eyes; half for single eye.
AAV, adeno-associated virus; IV, intravenous; RPE, retinal pigment epithelium; ROA, route of administration; WAC, wholesaler acquisition cost.
Luxturna is a registered trademark of Spark Therapeutics, Inc. Zolgensma is a registered trademark of Novartis Gene Therapies, Inc. Zynteglo is a trademark of bluebird bio, Inc. Skysona is a trademark of bluebird bio, Inc. Elevidys is a trademark of Sarepta Therapeutics, Inc.

OPGx-LCA5

Phase 1/2 Gene Therapy for LCA5

Alan,
LCA5 patient

LCA, Leber congenital amaurosis.

LCA5 is an Early-Onset, Severe Hereditary Retinal Degeneration

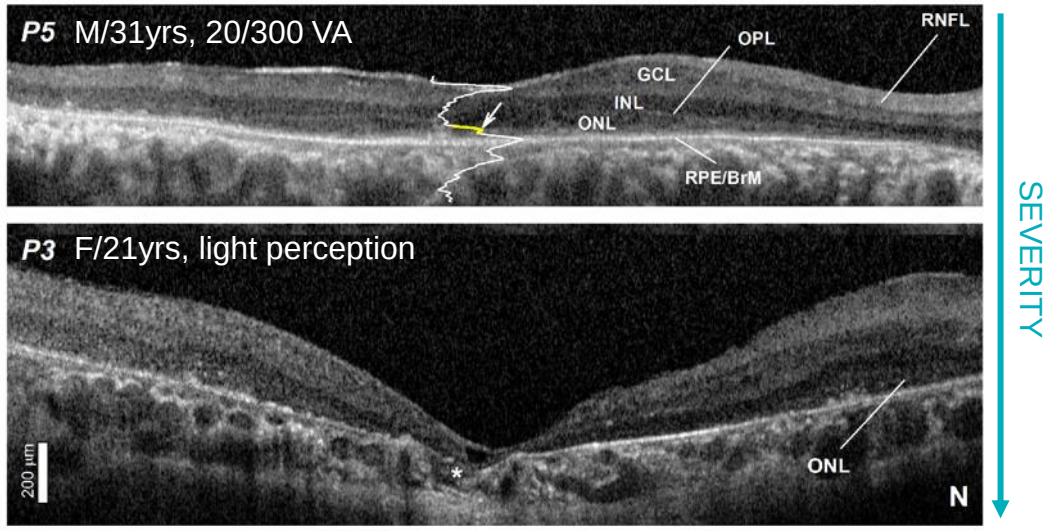
Prevalence

- ~200 patients in the U.S.[1,2]
- LCA5 represents ~2% of all LCA cases[3]

Clinical Characteristics

- Patients typically present in 1st year of life with nystagmus and vision loss[3,4]
- Early loss of rod-mediated peripheral vision results in constricted visual fields[3,4]
- Visual acuity often limited to light perception[3,4]
- Fundus photography exhibits optic nerve and pigmentary abnormalities, vascular attenuation, but also indicates preserved RPE in the pericentral retina[3]
- OCT can exhibit preserved photoreceptor inner/outer segments (*P5*) or severe displacement of retinal layers (*P3*)[3]

LCA5 patients exhibit preserved photoreceptors in the central retina in adulthood despite disease severity and early onset



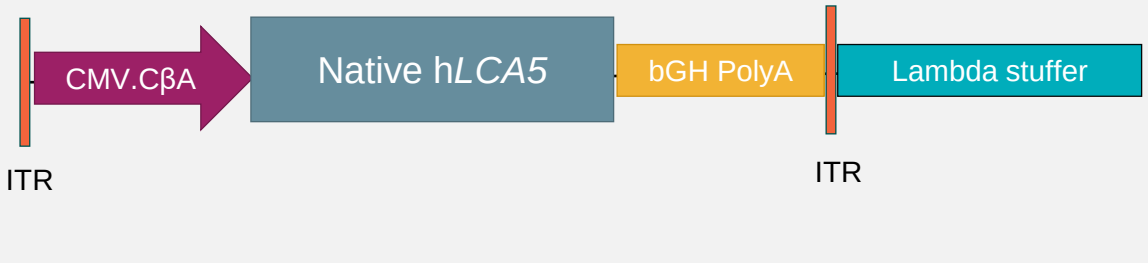
LCA5, Leber congenital amaurosis 5; OCT, optical coherence tomography; OPL, outer plexiform layer; RNFL, retinal nerve fiber layer; RPE, retinal pigment epithelium; VA, visual acuity.

1. Stone et al. *Ophthalmology.* 2017;124:1314-1331. **2.** Triangle Insights Group market research (compilation of prevalence studies), conducted August 2023. **3.** Uyhazi KE, et al. *Invest Ophthalmol Vis Sci.* 2020;61:30. **4.** Boldt K, et al. *J Clin Invest.* 2011;121(6):2169-2180.

OPGx-LCA5 Restores Structure and Function in Photoreceptors

- Lebercilin is a ciliary protein critical for protein trafficking in photoreceptor inner and outer segments[1]
- In LCA5, photoreceptor function is severely impaired due to absence of the structural protein lebercilin[1]
  - However, photoreceptors persist in LCA5 patients through the third decade of life, suggestive of a broad window for therapeutic intervention[2]
- **OPGx-LCA5 is designed to address mutations in the LCA5 gene, which encodes for the lebercilin protein**

OPGx-LCA5
(AAV8.CMV.CβA.hLCA5)



Clinically-derisked AAV8 vector with same promoter technology used in Luxturna

AAV, adeno-associated virus; ITR, inverted terminal repeat; LCA5, Leber congenital amaurosis 5.

1. Uyhazi KE, et al. *Invest Ophthalmol Vis Sci.* 2020;61:30. **2.** Song JY, et al. *Mol Ther.* 2018;26:1581-1593.

OPGx-LCA5 Improved Visual Function in Three Legally Blind Adult Patients

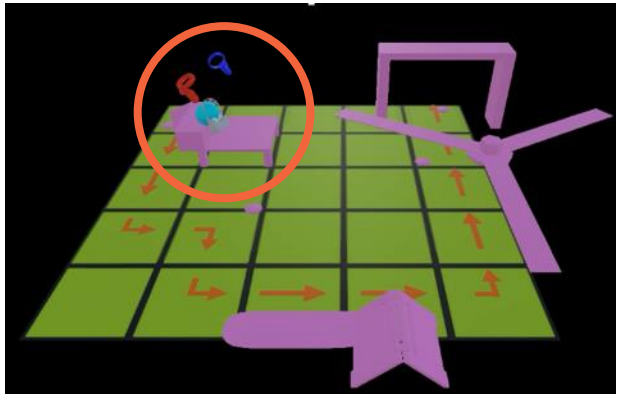
- **First-in-human, open label, dose-escalation study**
  - First three low-dose adult patients completed in 2024
- **All three patients demonstrated visual improvement at 6 months:**
  - Improvement in the FST functional test of light sensitivity
  - Significant improvement in mobility testing
  - Greater than 18-fold improvement in macular sensitivity in Patient 01-04
- **New 6-month data demonstrated:**
  - No SAEs
  - Well-tolerated
  - Clear signs of visual improvement in multiple assessments in all subjects

Phase 1/2 exhibits **compelling visual function improvement**

FST, full-field stimulus testing; LCA5, Leber congenital amaurosis 5; SAE, serious adverse event.

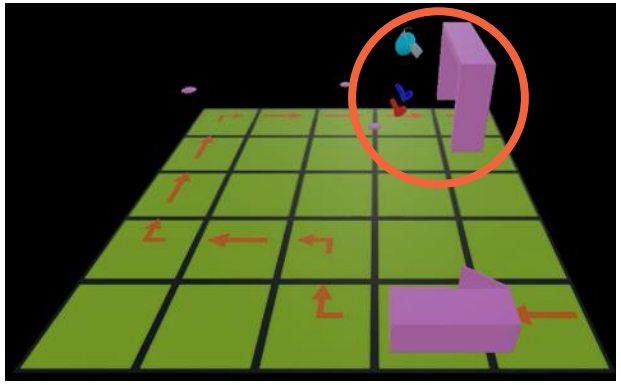
3/3 Patients Showed Improved Visual Function through 6 Months

Illustration of Virtual Reality Orientation and Mobility Test (VROMT)



BASELINE

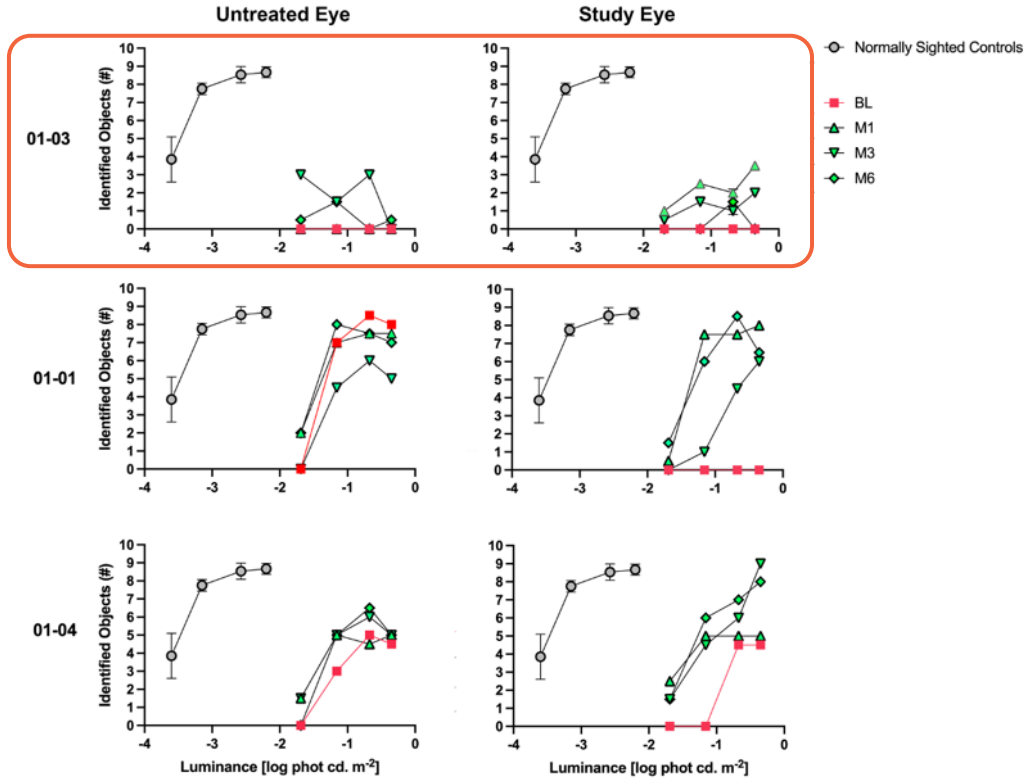
Patient was unable to complete the course or detect objects presented



1 MONTH
Post Treatment

Patient successfully completes entire course, detects objects presented, and finds exit door

All 3 Patients Demonstrated Improved Number of Objects Recognized in the Study Eye



Note: Subject 01-03 and 01-04 are cone-mediated disease and Subject 01-01 is rod-mediated disease.
*The approval of Luxturna was based on a similar type of clinical endpoint; Primary endpoint was the improvement in the multi-luminance mobility test.[1]

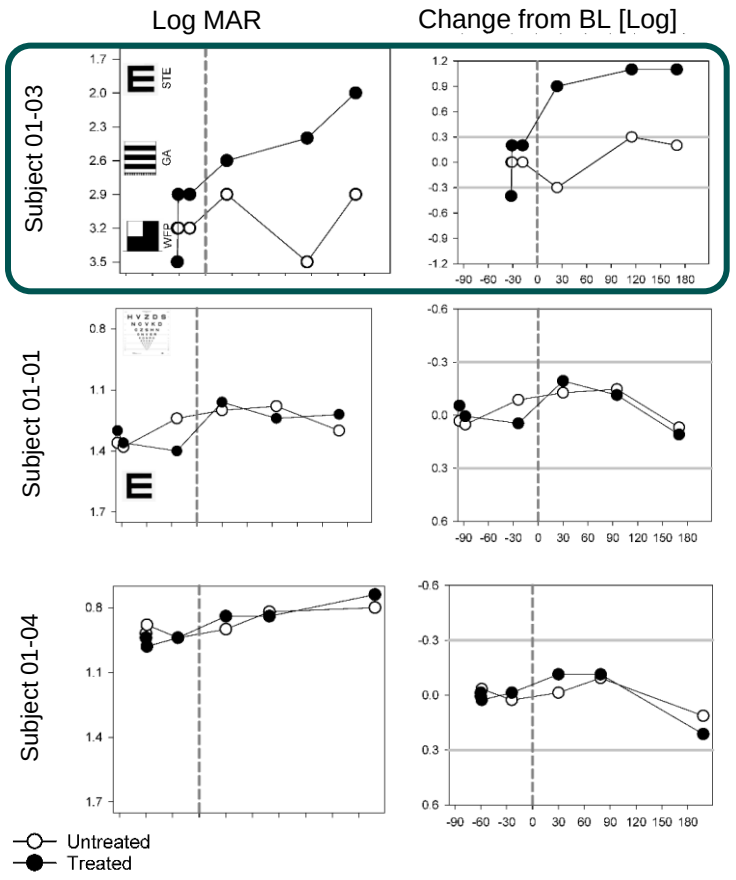
Videos colorized for presentation purposes.
BL, baseline; VR, virtual reality.

1. Luxturna Prescribing Information. Spark Therapeutics.

Broad Clinical Efficacy Across Multiple Clinical Outcome Measures

Visual Acuity

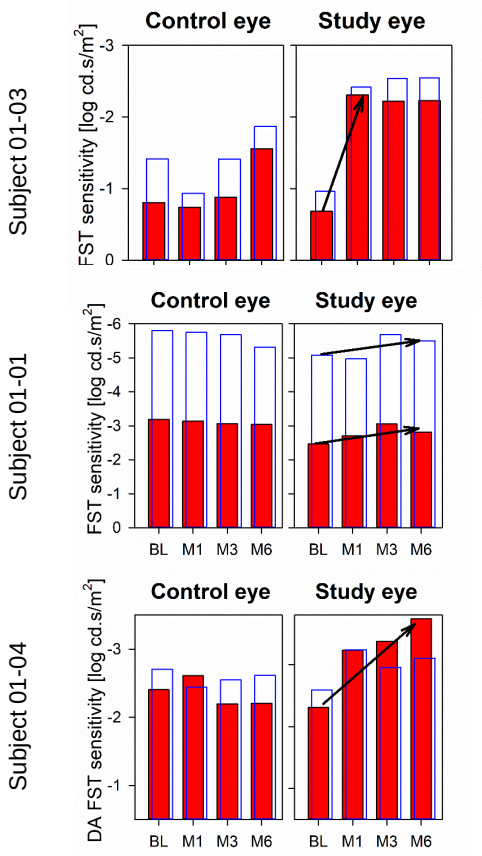
Formed vision possible for the first time in the most affected patient (01-03)



Full-Field Stimulus Testing

Significant gains in retinal sensitivity comparable to adult patients dosed with Luxturna

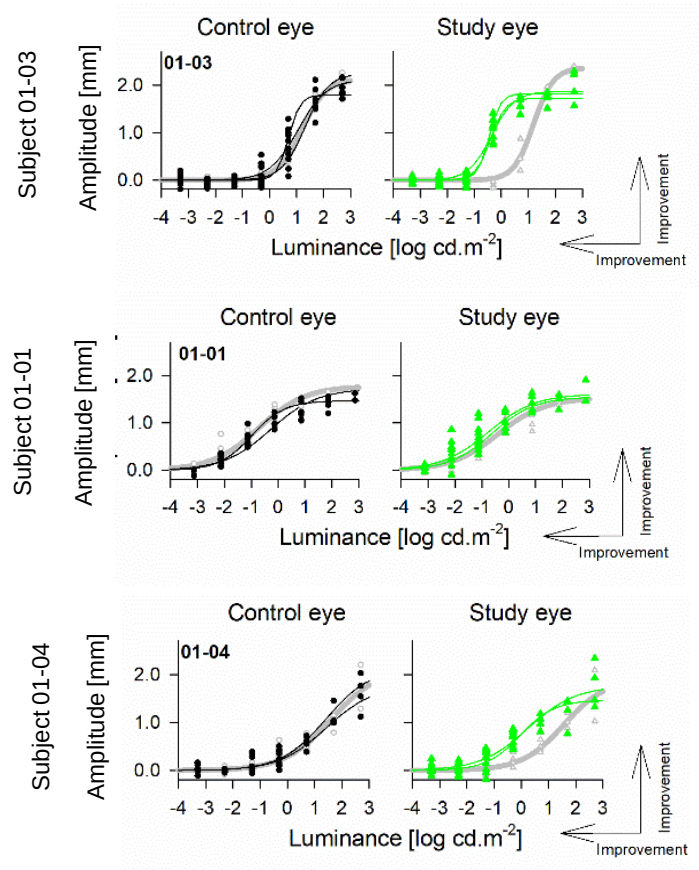
FST improvement observed for cone-mediated (red bars) and rod-mediated (blue outlined bars) vision



Pupillometry

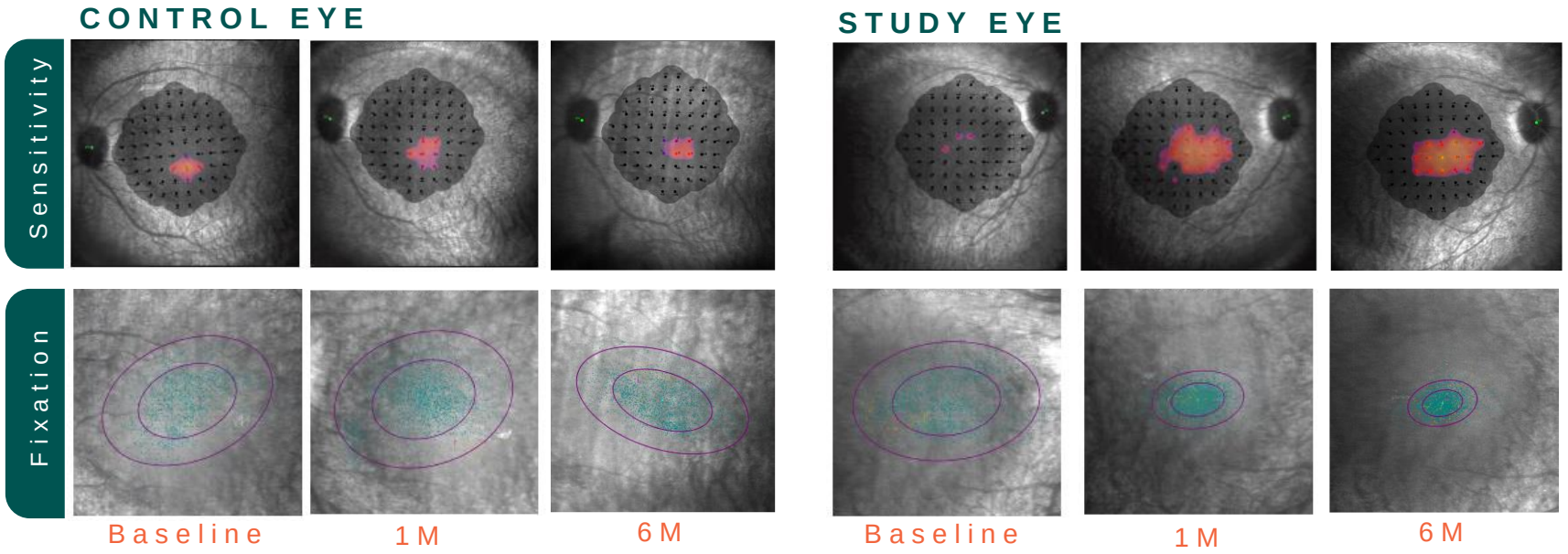
Improvement of pupillary light reflex in patients indicates restoration of eye-brain axis

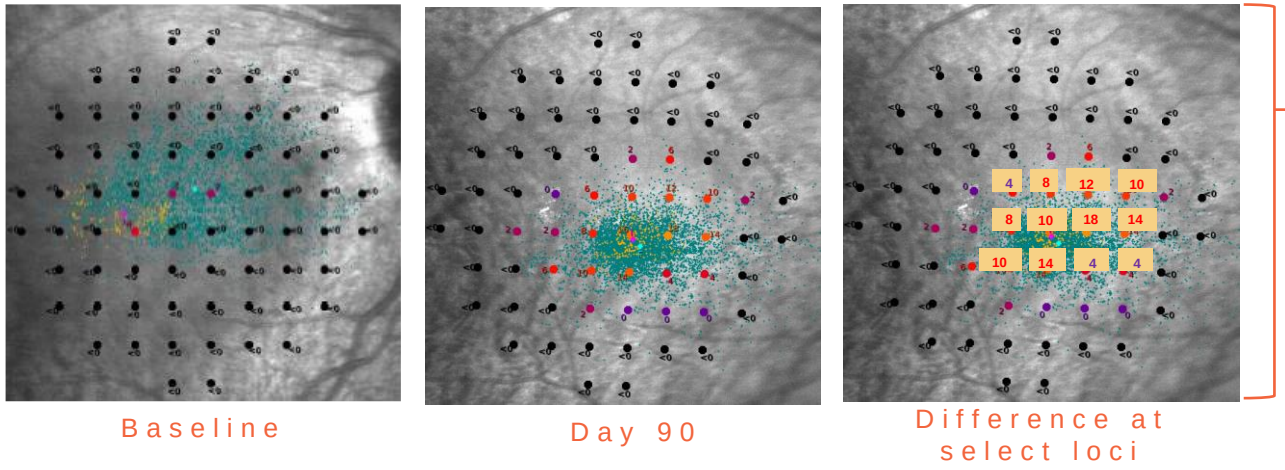
Pupil responses are larger in the study eye (green) compared to control and baseline (gray curves)



Note: Subject 01-03 and 01-04 are cone-mediated disease and Subject 01-01 is rod-mediated disease.
BL, baseline; FST, full-field stimulus testing.

Subject 01-04 had Greater than 18-fold Improvement in Macular Sensitivity





Microperimetry confirms foveal improvement

Demonstrates sensitivity gain and movement of a more stable fixation to the foveal center

Note: Microperimetry only possible in one subject; Two subjects could not fixate

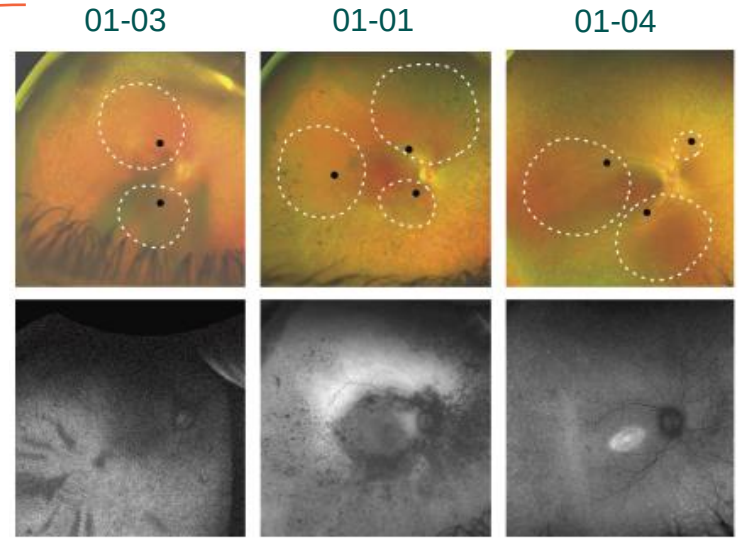
Possible FDA registrational endpoint

A 7dB difference in the same 5 prespecified loci at two or more timepoints may be a standalone registrational endpoint

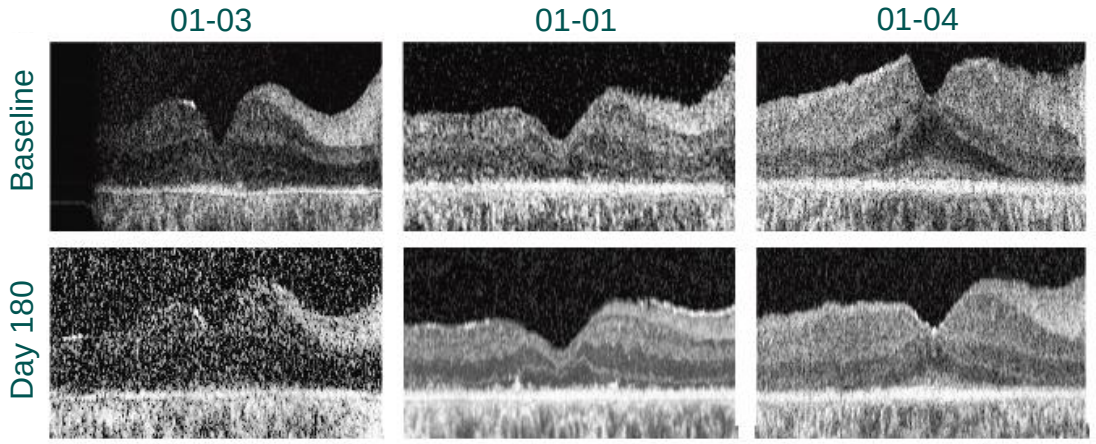
 FDA, Food and Drug Administration.

OPGx-LCA5 was Well-Tolerated with Anatomic Improvement

- No dose-limiting toxicities
- AEs were anticipated, mild, and unrelated to treatment
- All AEs resolved
- Uneventful subretinal injections
  - 300 µl volume; multiple injections extending near fovea
- Central retinal structure
  - Retina reattached
  - No major changes post-treatment



Subretinal injection sites (dashed circles)



Central retinal structure improved post-treatment

 AE, adverse event; LCA5, Leber congenital amaurosis 5.

OPGx-LCA5 Poised for Proof of Concept in Pediatric Subjects

- Ready for enrollment of pediatric patients in Q1 2025, with preliminary data expected in Q3 2025
- FDA Office of Orphan Drug Products grant awarded to support Phase 1/2 trial
- Rare Pediatric Disease Designation and Orphan Drug Designation received from the FDA, which confers **eligibility for Priority Review Voucher** upon BLA approval
- **Accelerated clinical development pathway to approval** may be appropriate if similar efficacy is demonstrated in pediatric patients

BLA, Biologics License Application; FDA, Food and Drug Administration; LCA5, Leber congenital amaurosis 5.

OPGx-BEST1

Phase 1/2-Ready Gene Therapy for BEST1-associated Disease

BEST1, bestrophin 1.

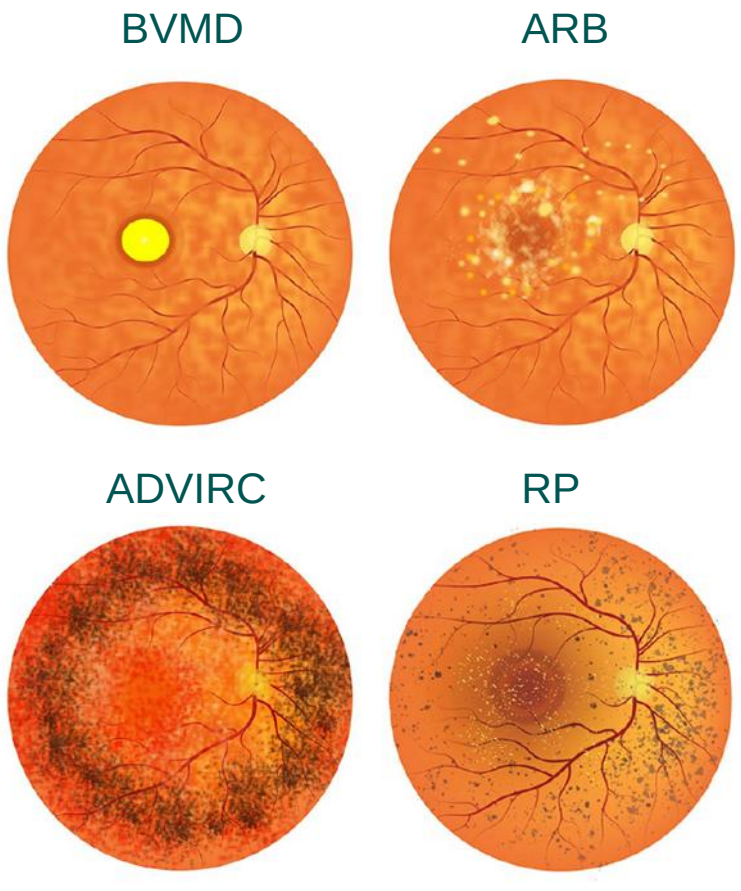
BEST1 Mutations are Associated with Retinal Degeneration

Prevalence

- ~9,000 patients the U.S.[1]
- Accounts for ~3.5% of all IRDs[2]

Clinical Characteristics

- Mutations in BEST1 have been associated with at least five clinically distinct retinal degenerative diseases[3]
- Bestrophinopathy is characterized by retinal lesions, with symptoms including dimness of vision, metamorphopsia (distorted vision), or scotoma (blind spot)[4]
- Mutations, depending on their impact on BEST1 function, may lead to serous retinal detachment, vitelliform lesions in the macular region, macular atrophy, and loss of central vision



ADVIRC, autosomal dominant vitreoretinochoroidopathy; ARB, autosomal recessive bestrophinopathy; BEST1, bestrophin 1; BVMD, Best vitelliform macular dystrophy; RP, retinitis pigmentosa.

1. Triangle Insights Group market research (compilation of prevalence studies), conducted August 2023. **2.** Amato A, et al. *Saudi J Ophthalmol.* 2023;37(4):287-295. **3.** Johnson AA, et al. *Prog Retin Eye Res.* 2017;58:45-69. **4.** Tripathy K, et al. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024.

OPGx-BEST1 Addresses High Prevalence IRDs Using Derisked Vectors

- BEST1 functions as both a calcium-activated chloride channel and a regulator of intracellular Ca2+ signaling in RPE cells
- RPE-photoreceptor interaction is affected in bestrophinopathies
  - Most bestrophinopathies exhibit a slow rate of decline and central photoreceptors usually remain viable for decades, providing a wide therapeutic window
- **OPGx-BEST1 restores retinal ion homeostasis in bestrophinopathies, ameliorating retinal structural and functional deficits**

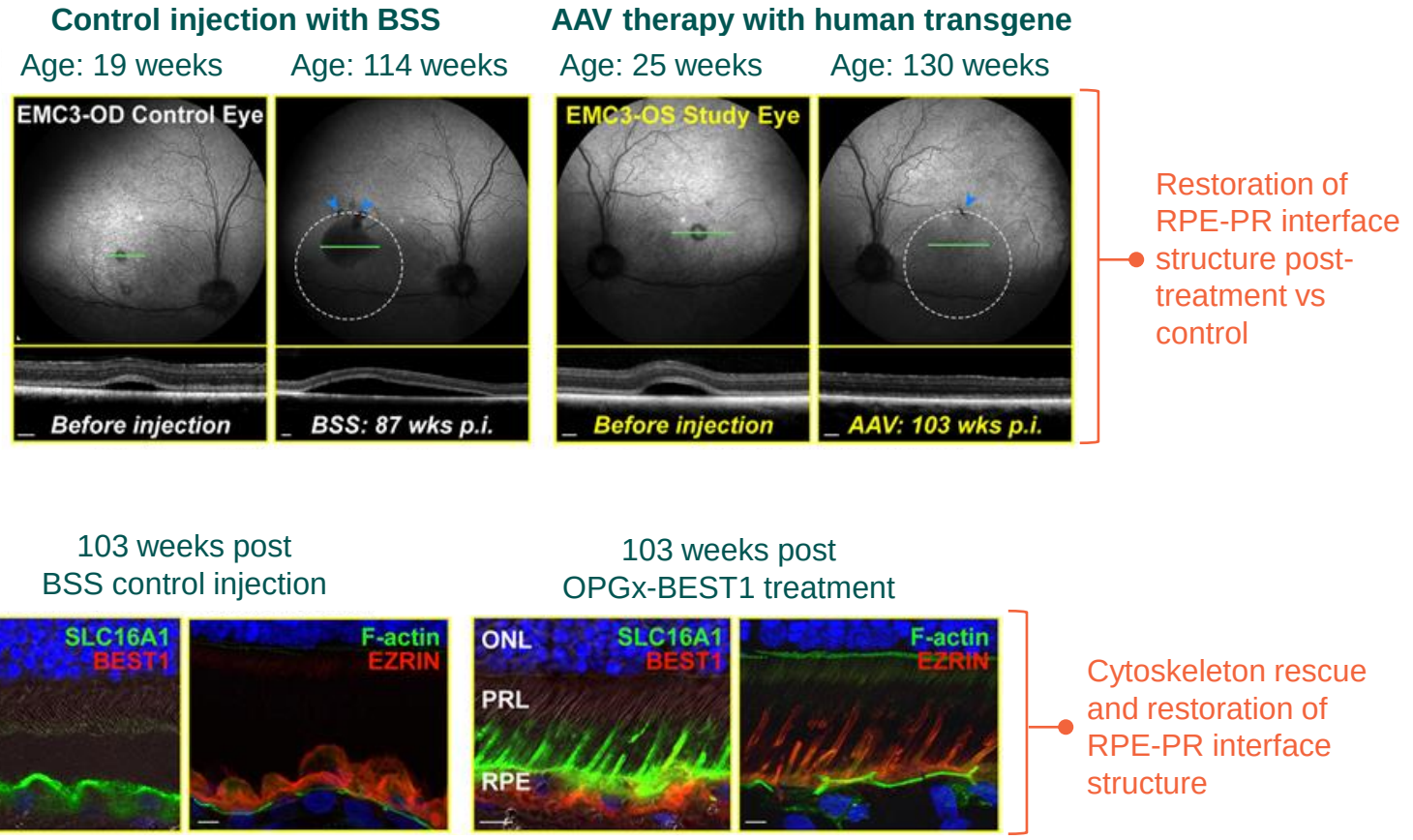
OPGx-BEST1
(AAV2.VMD2.hBEST1)

BEST1 is targeted using the AAV2 capsid employed in Luxturna, an RPE-specific BEST1 promoter

AAV, adeno-associated virus; BEST1, bestrophin 1; IRD, inherited retinal disease; ITR, inverted terminal repeat; RPE, retinal pigment epithelium.
Amato A, et al. *Saudi J Ophthalmol.* 2023;37:287-295.

Compelling Safety and Efficacy Data from IND-Enabling Canine Study

- Robust restoration of RPE-photoceptor interface demonstrated in canine models of autosomal recessive BEST1 disease
- Treated cBEST1 models exhibit reversal of lesions and retinal microdetachments, which are hallmarks BEST1 disease



AAV, adeno-associated virus; BEST1, bestrophin 1; BSS, balanced salt solution; IND, Investigational New Drug; PR, photoreceptor; RPE, retinal pigment epithelium.

Guziewicz, et al. *PNAS.* 2018;115:E2839–E2848.

Data from OPGx-BEST1 Phase 1/2 Study Expected in Q4 2025

- OPGx-BEST1 well-tolerated in toxicology studies; human dose and NOAEL established
- BEST1 AAV GMP drug product ready for human dosing; subject to regulatory clearance
- Positive feedback from EU regulators for Phase 1/2 clinical trial design in Germany
- Ready to initiate Phase 1/2 clinical trial in Germany, with data anticipated in Q4 2025; subject to regulatory clearance

AAV, adeno-associated virus; BEST1, bestrophin 1; EU, European Union; GMP, good manufacturing practices; NOAEL, no-observed-adverse-effect-level.

OPGx-RHO

Gene Therapy for Autosomal Dominant RP Caused by RHO Mutations

RHO, rhodopsin; RP, retinitis pigmentosa.

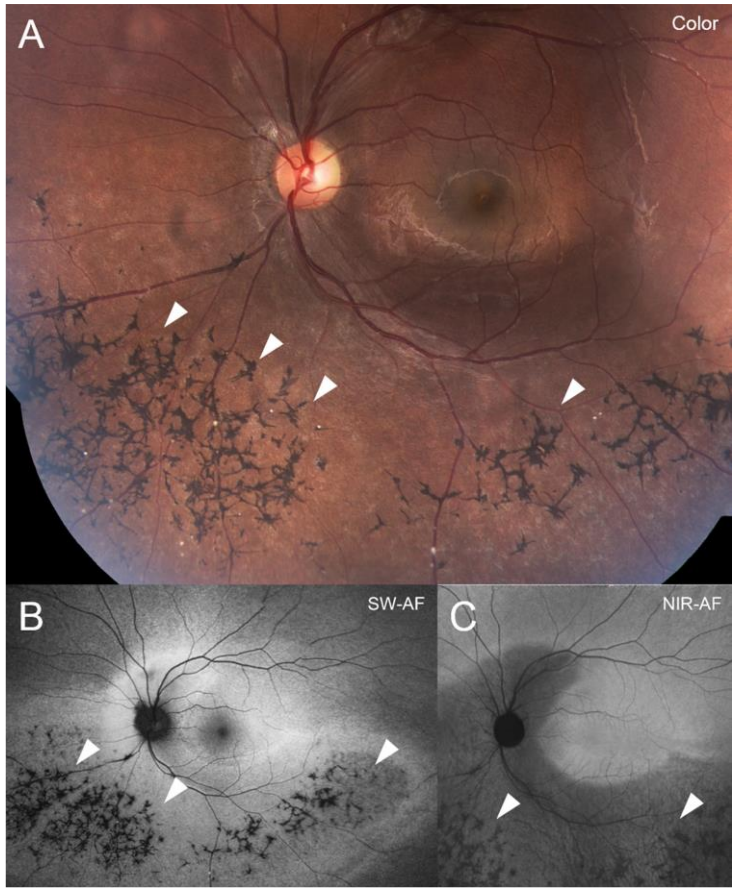
Mutations in the RHO Gene are the Most Common Cause of Autosomal Dominant Retinitis Pigmentosa

Prevalence

- ~5,600 patients in the U.S.[1]
- Mutations in the RHO gene are the most common cause of adRP, accounting for ~20-30% of all cases[2]

Clinical Characteristics

- Night blindness starting in adolescence[2,3]
- Progressive loss of peripheral vision that progresses centrally resulting in a tunnel-like field of vision
- **Two clinical phenotypes:**[4]
  - **Class A (fast progression):** Severely abnormal rod function from early life, cystoid changes common
  - **Class B (adult onset)**: Maintains rod function into adulthood, structural degeneration progresses from inferior retina (superior field) to central and superior



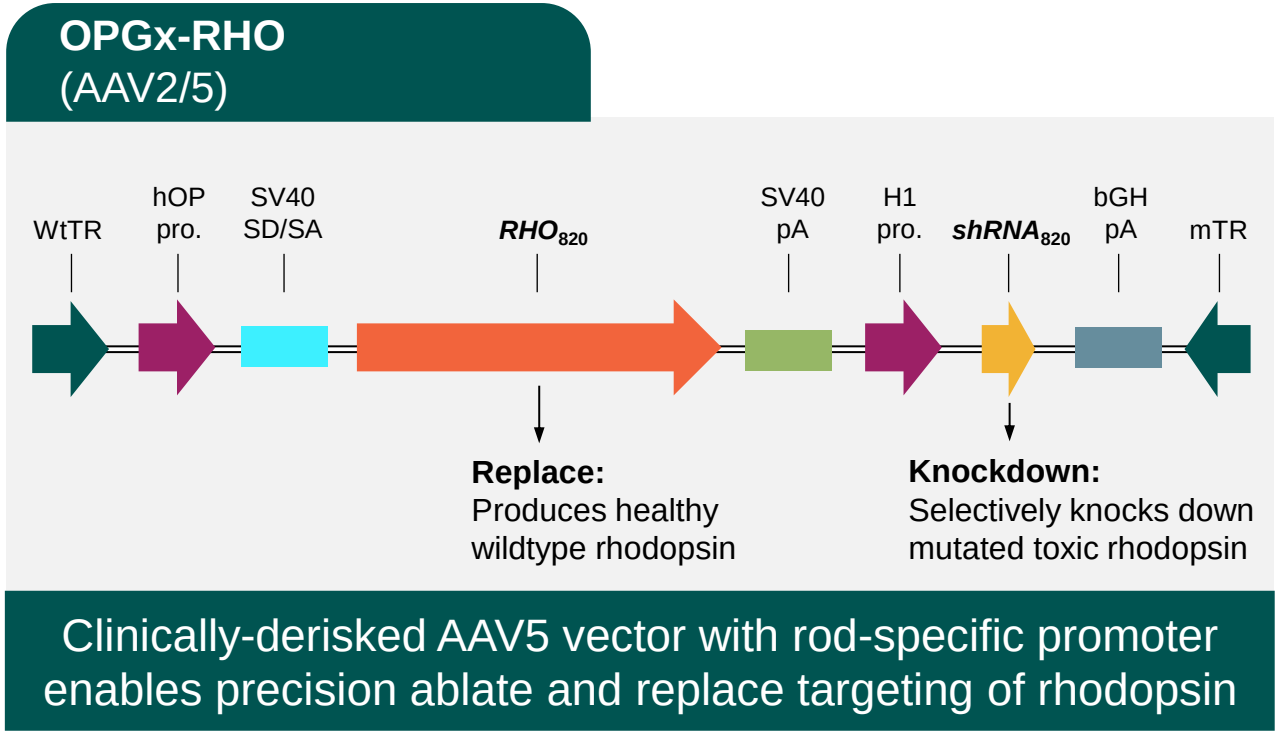
adRP-*RHO* presenting with bone spicule-like intraretinal pigment aggregation, indicative of rod-cone dystrophy leading to vision loss

adRP, autosomal dominant retinitis pigmentosa; RHO, rhodopsin.

1. Triangle Insights Group market research (compilation of prevalence studies), conducted August 2023. **2.** Daiger SP, et al. *Cold Spring Harb Perspect Med.* 2014;10;5:a017129. **3.** Schuerch K, et al. *Retina.* 2016;36(Suppl 1):S147-S158. **4.** Lewin AS, et al. *Cold Spring Harb Perspect Med.* 2014;18;4:a017400.

OPGx-RHO Utilizes a Single Vector to Enable RHO Mutation-Independent Knockdown and Replace Strategy

- Rhodopsin is an important component of the photopigment in photoreceptors that absorbs light and provides structure to the rod outer segment
- AD mutations in rhodopsin cause RHO-adRP, which is characterized by progressive death of rod photoreceptors that can lead to vision loss
- **OPGx-RHO is designed to preserve rod and cone photoreceptors by ablating toxic rhodopsin and replacing the protein with a functional copy**

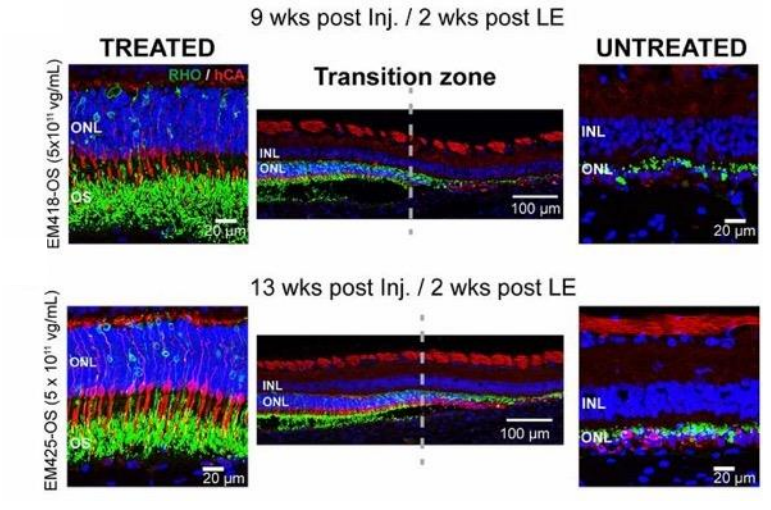


AD, autosomal dominant; adRP, retinitis pigmentosa; RHO, rhodopsin.

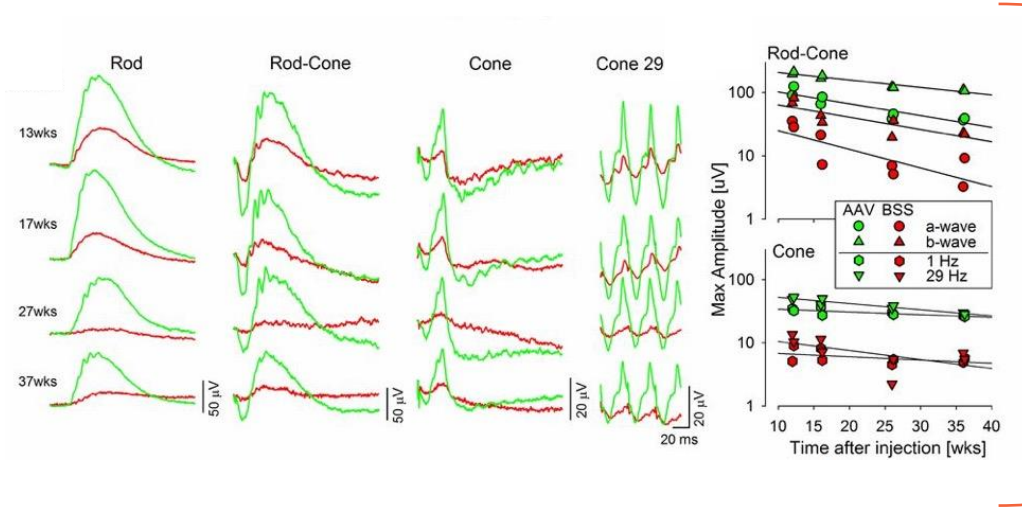
Trastulli G, et al. *Genes (Basel).* 2024;15(9):1158.

Successful Treatment of Retinal Degeneration in RHO-adRP Canine Model

- Mutation-independent, single-vector AAV construct, delivered via subretinal injection
  - Human opsin promoter
  - shRNA-mediated knockdown of mutant and/or WT RHO
  - Replacement with functional RHO
- Preserved integrity of the entire structure of photoreceptors in treated eyes
- Provided long-term protection of retinal structure and function from degeneration



Non-invasive retinal imaging showed photoreceptors in treated areas were completely preserved



Consistently better rod- and cone-mediated function and response in AAV-treated (green) vs vehicle-treated (red) retinas

AAV. adeno-associated virus; adRP, autosomal dominant retinitis pigmentosa; WT RHO, wild-type rhodopsin; RHO, rhodopsin; shRNA, short hairpin ribonucleic acid.

Cideciyan AV, et AL. *Proc Natl Acad Sci USA.* 2018;115:E8547-E8556.

OPGx-RDH12

Gene Therapy for Retinal Degenerations Caused by Mutations in the RDH12 gene

Abigail,
RDH12 patient

RDH12, retinol dehydrogenase 12.

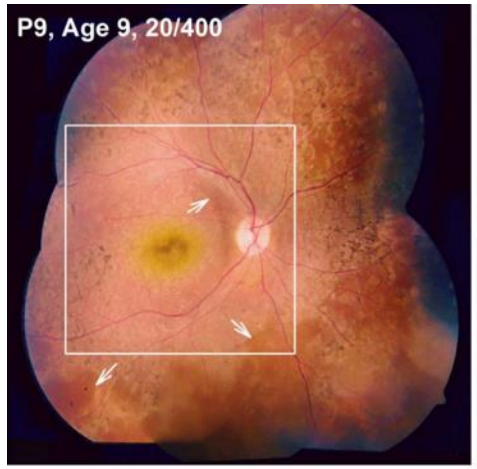
Mutations in the RDH12 Gene Cause Severe Retinal Degeneration

Prevalence

- ~1100 patients in the U.S.[1,2]

Clinical Characteristics

- Variants in RDH12 have been associated with autosomal recessive EOSRD/LCA, CORD, RP, MD and adRP[3]
- **RDH12-EOSRD/LCA:** Progressive macular degeneration causing peripheral RPE atrophy with pigmented deposits, leading to visual impairment in infancy/early childhood, and usually legal blindness before the third decade of life
- **RDH12-CORD:** Presents with broader compromise of posterior pole and progressive loss of central and peripheral vision over time; Onset of visual disturbance as late as the third decade
- **RDH12-RP:** Affects mid-periphery, causing symptoms from the second or third decade with maintained visual acuity until late adulthood



Central depigmentation that contrasted with a better appearing RPE in midperipheral retina[4]

Overt pigmentary retinopathy with bone spicule pigmentation within the macula[4]

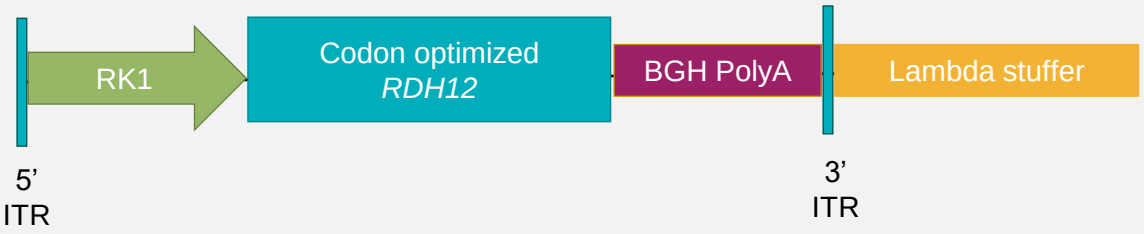
adRP, autosomal dominant retinitis pigmentosa; CORD, cone-rod dystrophy; EOSRD, early-onset severe retinal dystrophy; LCA, Leber congenital amaurosis; MD, macular dystrophy; RDH12, retinol dehydrogenase 12; RP, retinitis pigmentosa; RPE, retinal pigment epithelium.

1. Stone et al. *Ophthalmology.* 2017;124:1314-1331. **2.** Triangle Insights Group market research (compilation of prevalence studies), conducted August 2023. **3.** Daich VM, et al. *Ophthalmic Genet.* 2022;43:1-6. **4.** Aleman TS, et al. *Invest Ophthalmol Vis Sci.* 2018;59:5225–5236.

OPGx-RDH12 Leverages Established AAV8 Vector Technology for Addressing Photoreceptor Degenerations

- RDH12 has an important role in clearing excessive retinal and other toxic aldehydes produced by light exposure
- Mutations in the RDH12 gene cause defective clearance of toxic by-products and/or oxidative and endoplasmic reticulum stress
  - Functional rod and cone vision can persist through second and third decades of life, suggesting a broad therapeutic window; In addition, RDH12 is attractive therapeutically due to its small size
- **OPGx-RDH12 is designed to restore protein expression and halt deterioration by transporting a functional gene to photoreceptors in the retina**

OPGx-RDH12
(AAV8.RK1.hoptRDH12)



Established AAV8 vector and RK1 promoter targets affected photoreceptors

AAV, adeno-associated virus; RDH12, retinol dehydrogenase 12; RK1, rhodopsin kinase 1.
Daich VM, et al. *Ophthalmic Genet.* 2022;43(3):1-6.

Additional Indications Ready to Progress Quickly

MERTK, NMNAT1, CNGB1

Maci, NMNAT1 patient, with Mom Jenna

CNGB1, cyclic nucleotide-gated channel β1; MERTK, MER proto-oncogene tyrosine kinase; NMNAT1, nicotinamide mononucleotide adenylyltransferase 1.

Broad Pipeline of Additional Indications Ready to Progress Quickly

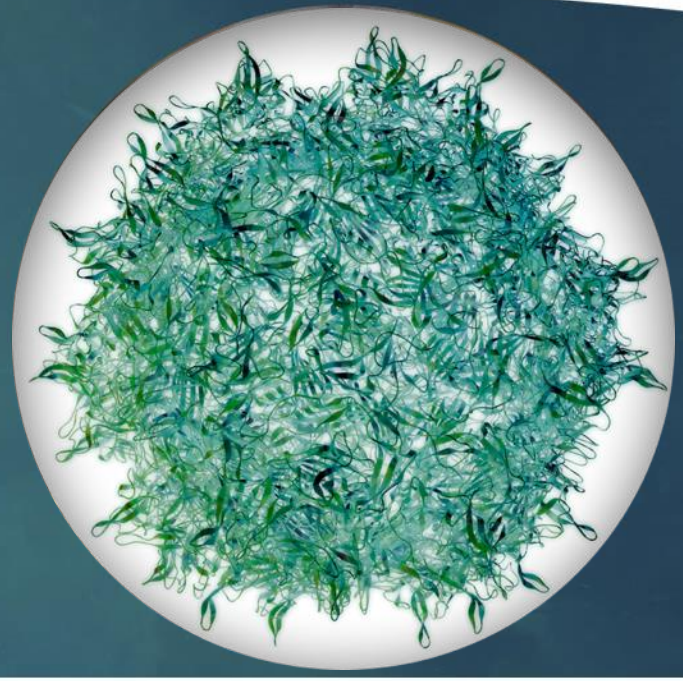
	Age of Onset	Prevalence	Program Stage
MERTK (OPGx-MERTK)	• Second decade of life (generally before 18 years of age)[1]	• ~600 patients in the U.S.[2]	• Pre-IND stage
NMNAT1 (OPGx-NMNAT1)	• Early childhood (frequently within the first year of life)[3]	• ~800 patients in the U.S.[2]	• Pre-IND stage
CNGB1 (OPGx-CNGB1)	• Young adult onset with slow progression & preserved visual acuity through late adulthood[4]	• ~400 patients in the U.S.[2]	• In collaboration with an NIH funded consortium of university researchers and the Foundation of the NIH's Bespoke Gene Therapy Consortium to bring this therapy into and through a Phase 1 clinical trial

CNGB1, cyclic nucleotide-gated channel β1; IND, Investigational New Drug; MERTK, MER proto-oncogene tyrosine kinase; NMNAT1, nicotinamide mononucleotide adenylyltransferase 1; NIH, National Institutes of Health.

1. Audo I, et al. *Hum Mutat.* 2018;39(7):887-913. **2.** Stone EM, et al. *Ophthalmology.* 2017;124(9):1314-1331. **3.** Yi Z, et al. *Eye (Lond).* 2022;36:2279-2285. **4.** Nassisi M, et al. *Hum Mutat.* 2021;42:641-666.

Candidates that Fuel Our Future Growth

Phentolamine Ophthalmic Solution 0.75% Franchise and APX3330



Global Partnership for Phentolamine Ophthalmic Solution 0.75% Franchise Strengthens Financial Position

All Three Indications Have Sizable U.S. Patient Populations

1. **Treatment of pharmacologically-induced mydriasis[1]**
   100M eye dilations conducted every year[2]
2. **Treatment of presbyopia**
   133M presbyopes[3]
3. **Treatment of decreased visual acuity under low light conditions**
   - 600-700K laser vision correction procedures per year[4]
   - 35% of LASIK patients report dim light disturbances[5]

- Approved for reversal of pharmacologically-induced mydriasis and launched April 2024
- Licensing agreement provides funding for two additional indications, with partner responsible for commercialization
- Two Phase 3 studies ongoing in presbyopia and decreased visual acuity under low light conditions, with topline data expected in 2025
- Potential for additional milestones and royalties

LASIK, laser assisted in situ keratomileusis.

1. Ryzumvi. Prescribing Information. Ocuphire Pharma, Inc.; 2023. **2.** Wilson FA, et al. J Ophthalmol. 2015;2015:435606. **3.** Berdahl J, et al. *Clin Ophthalmol.* 2020;14:3439-3450. **4.** Lindstrom RL. Millennials will be the next target for laser vision correction. Ocular Surgery News. April 1, 2019. Accessed December 12, 2023. https://www.healio.com/news/ophthalmology/20190329/millennials-will-be-the-next-target-for-laser-vision-correction **5.** Mamalis N. *J Cataract Refract Surg.* 2014;40:343-344.

Differentiated MOA of Phentolamine Makes it Well-Suited for Presbyopia

Favorable safety and tolerability profile, with minimal to no headaches or dimming and no increase in risk of retinal detachment, retinal tears, or vitreofoveal traction

Fast onset of action and extended durability, with reduction of pupil size lasting over 20 hours

Once-daily evening dosing enables improved near vision immediately upon awakening

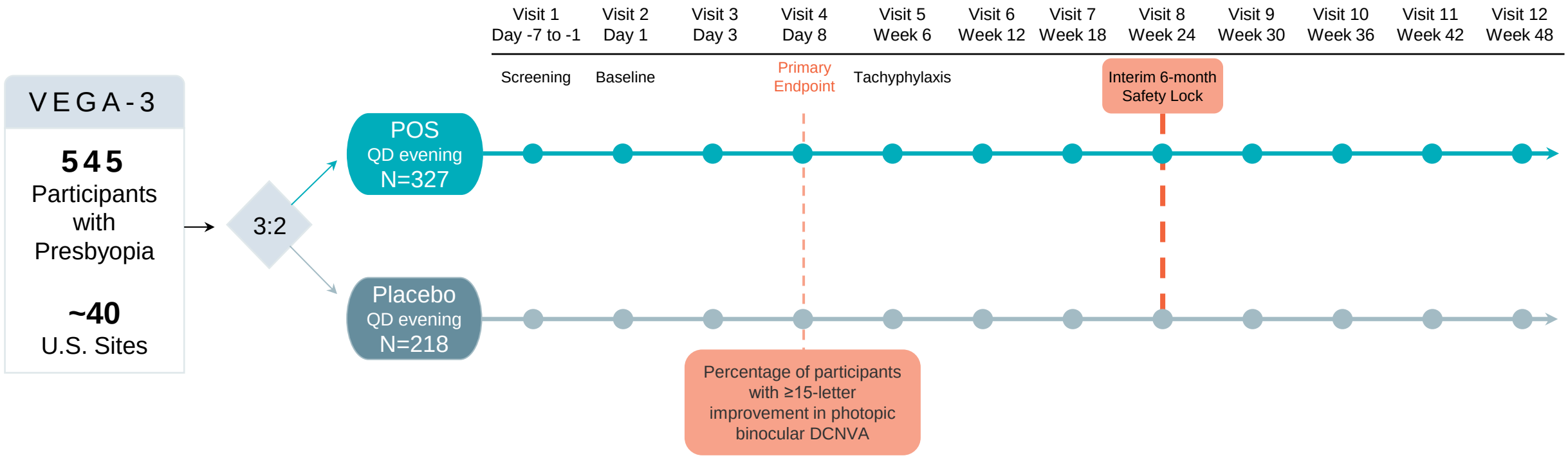
Our Objective

Provide a safe, long-lasting and effective solution that **restores near vision and enhances overall visual performance in daylight and low-luminance conditions**

MOA, mechanism of action.

VEGA Clinical Program

VEGA-3 Phase 3 Pivotal Study is Ongoing

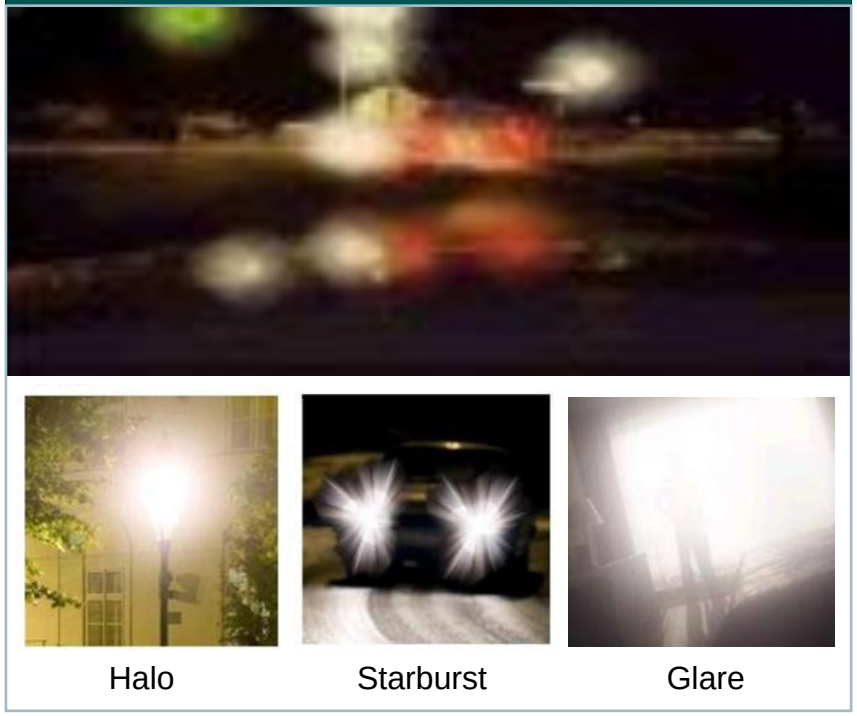


- Currently recruiting
- Topline results expected 1H 2025
- Data will support sNDA

DCNVA, distance-corrected near visual acuity; FDA, Food & Drug Administration; POS, Phentolamine Ophthalmic Solution 0.75%; QD, once-daily; sNDA, supplemental New Drug Application.
Clinicaltrials.gov ID: NCT06542497

Dim Light Disturbances Can Have a Significant Impact on Quality of Life

There are no FDA-approved treatments for dim light disturbances[1]



- Decreased low contrast visual acuity under low light conditions or “dim light disturbances” occur when the pupil dilates in low light conditions allowing peripheral unfocused rays of light to enter the eye[1]
- Common in patients with increased ocular aberrations and ocular scatter from refractive surgery, certain IOL implants, cataract, and dry eye[1]
- Can cause halos, starbursts, and glare that significantly impairs vision[1]
- 600-700K laser vision correction procedures per year in the U.S.[2]

  → 35% of LASIK patients report dim light disturbances[3]
  → 30% experience worsening in driving capabilities after PRK[1]

IOL, intraocular lens; LASIK, laser-assisted in situ keratomileusis; PRK, photorefractive surgery.

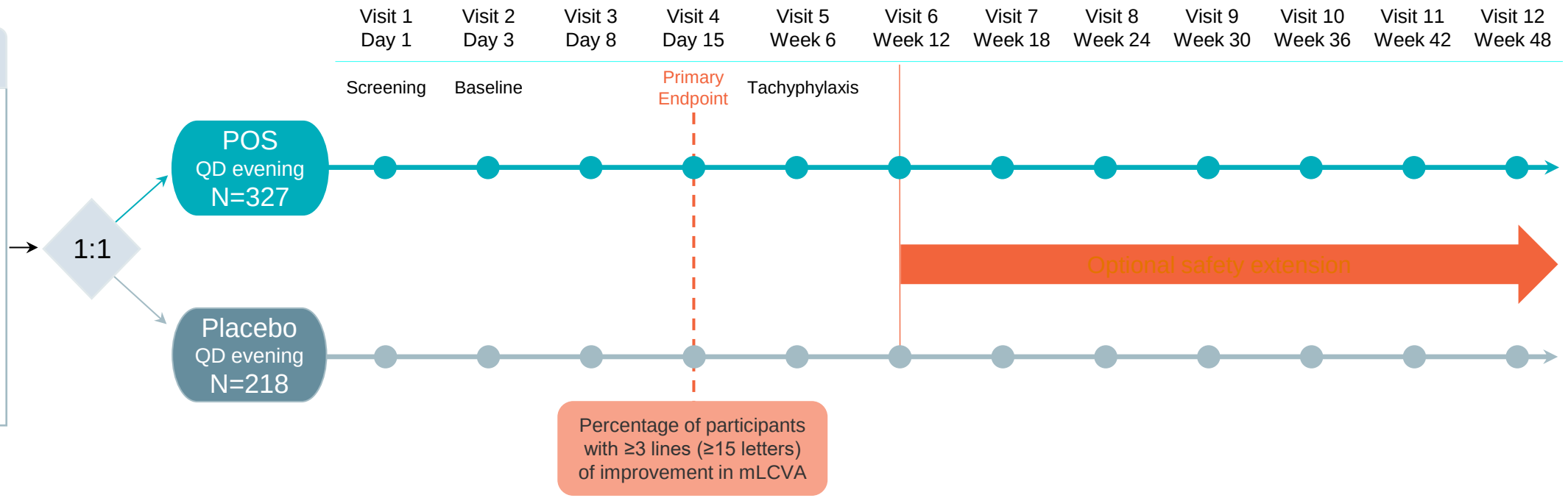
1. Pepose J, et al. *BMC Ophthalmology.* 2022;22:402. **2.** Lindstrom RL. Millennials will be the next target for laser vision correction. Ocular Surgery News. April 1, 2019. Accessed December 12, 2023. https://www.healio.com/news/ophthalmology/20190329/millennials-will-be-the-next-target-for-laser-vision-correction **3.** Eydelman M, et al. *JAMA Ophthalmol.* 2017;135:13-22.

LYNX-2 Phase 3 Pivotal Study is Ongoing

LYNX-2

200
Participants post-keratorefractive surgery with DLD

~40
US Sites



- Conducted under SPA agreement with FDA
- Currently recruiting
- Topline results expected Q1 2025

DLD, dim light disturbances; FDA, Food and Drug Administration; mLCVA mesopic low contrast best-corrected distance visual acuity; POS, Phentolamine Ophthalmic Solution 0.75%; QD, once daily; SPA, Special Protocol Assessment.
Clinicaltrials.gov ID: NCT06349759

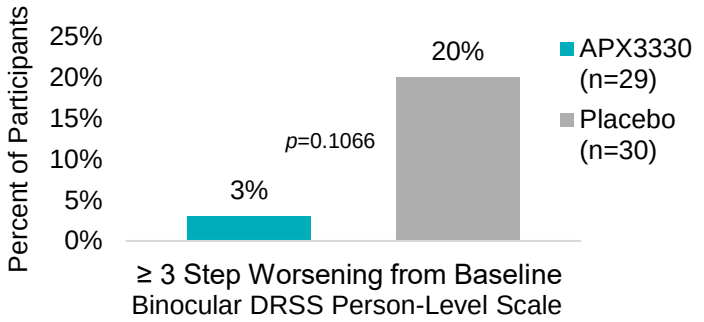
Completed Phase 2 Study of Oral APX3330 Shows Promising Safety and Efficacy

Diabetic Retinopathy Market is Large and Underserved

- DR is the leading cause of blindness in working age adults, impacting 10M patients in the U.S.[1,2]
- Most have early-stage disease or NPDR, which is generally untreated and represents a $6B market[3]

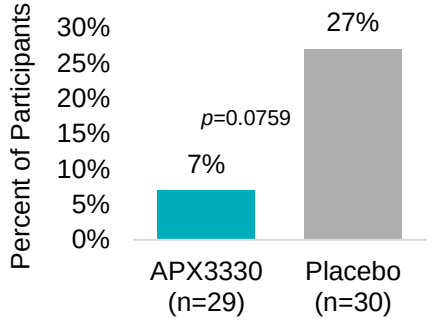
ZETA-1 Phase 2 Subset Analysis Results

Percentage of Participants with ≥ 3 Step Worsening at Week 24 on Binocular DRSS Person-Level Scale[4]



Fewer APX3330-treated patients experienced DR worsening, demonstrating efficacy on the FDA-confirmed endpoint of ≥ 3 step worsening on the binocular DRSS person-level scale

Percentage of Participants Developed PDR by Week 24[5]



Fewer APX3330-treated participants developed PDR compared to placebo

▶ **Favorable Safety & Tolerability Profile with** ocular AEs similar between APX3330 and placebo groups[6]

NPDR market calculated based on total DR market size of 8.9B in 2023 and NPDR revenue share of 70.38% in 2023.
AEs, adverse events; DR, diabetic retinopathy; DRSS, Diabetic Retinopathy Severity Scale; NPDR, non-proliferative diabetic retinopathy; PDR, proliferative diabetic retinopathy.

1. Flaxel CJ, et al. Diabetic retinopathy preferred practice pattern®. *Ophthalmology.* 2020;127:66-145. **2.** Prevalence of diabetic retinopathy. Centers for Disease Control and Prevention. Accessed December 21, 2023. https://www.cdc.gov/visionhealth/vehss/estimates/dr-prevalence.html **3.** Data on file. 4. ZETA-1 Table 14.2.2.7.6. **5.** ZETA-1 Table 14.2.6.7.5. **6.** ZETA-1 Tables: 14.3.1.1, 14.3.1.7, 14.3.1.10, 16.2.7.

APX3330 is Primed for a Pivotal Study and Available for Partnering

Why Partnering:

- Due to capital requirements and development timelines for APX3330, we determined that future clinical development of a late-stage DR program would be best suited for a partner
- Redirecting our spend towards more capital-efficient gene therapy programs

Effort Supported By:

- Continuing SPA review by the FDA on novel NPDR registrational trial design
- Process chemistry defined and a readiness plan to manufacture developed
- Completing ADME & BA clinical trials
- Non-clinical studies exploring potential additional indications

ADME, absorption, distribution, metabolism, and excretion; BA, bioavailability; DR, diabetic retinopathy; FDA, Food and Drug Administration; NPDR, non-proliferative diabetic retinopathy; SPA, Special Protocol Assessment.

Fully Integrated Leadership Team with Decades of Expertise and Successful Track Record of Development and Commercialization

George Magrath, MD, MBA, MS
Chief Executive Officer

Jean Bennett, MD, PhD
Scientific Advisor

Ben Yerxa, PhD
President

Joseph Schachle, MBA
Chief Operating Officer

Ash Jayagopal, PhD, MBA
Chief Scientific & Development Officer

Nirav Jhaveri, MBA
Chief Financial Officer

Acquisition Creates Leading IRD Franchise with Multiple Near-Term Milestones

Acquisition

- Combines partnered asset in Phentolamine with Opus's cutting-edge, rare IRD gene therapy portfolio
- Cash runway expected to extend into 2026
- Experienced management team

Upcoming Milestones*

- **OPGx-LCA5:** Ready for enrollment of pediatric subjects in Phase 1/2 study
- **OPGx-BEST1:** Ready to initiate Phase 1/2 clinical trial in Germany
- **OPGx-RHO:** IND submission
- **OPGx-RHD12:** Ready to initiate NHP GLP tox study
- **Phentolamine Ophthalmic Solution 0.75%:**
  - Dim light disturbances: LYNX-2 Phase 3 topline data expected Q1 2025
  - Presbyopia: VEGA-3 Phase 3 topline data expected 1H 2025

*All upcoming milestones are subject to regulatory approval.
BEST1, bestrophin 1; GLP; Good Laboratory Practice; IND, Investigational New Drug; IRD, inherited retinal disease; LCA5, Leber congenital amaurosis 5; NHP, nonhuman primate; RDH12, retinol dehydrogenase 12; RHO, rhodopsin.

Every patient's eyes tell a story

Images of real patients with IRDs.