



Corporate Presentation

Leader in AAV Gene Therapy

7 | 18 | 2022

Forward-looking statements

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Seeking to improve
lives through the
curative potential of
gene therapy

Leading pipeline of AAV Therapeutics with the potential to deliver one-time treatments

Strategic partnership with AbbVie to develop and commercialize AAV Therapeutics for retinal disease

Proprietary AAV Therapeutics manufacturing with analytics, delivery device and global supply platform

Strong balance sheet to fund operations into 2025

“5 x 25” strategy to progress 5 AAV Therapeutics from our internal pipeline and licensed programs into pivotal-stage or commercial products by 2025

REGENXBIO's internal pipeline

Indication	Development Stage				Commercial Rights
	Research	Preclinical	Phase I / II	Phase III	
Retinal Disease					
wet AMD (subretinal)	RGX-314				abbvie U.S. Equal Profit Share Ex-U.S. Tiered Royalties
wet AMD (suprachoroidal)	RGX-314				
Diabetic retinopathy (suprachoroidal)	RGX-314				
Other chronic retinal conditions					
Batten disease (CLN2) ▲★	RGX-381				Worldwide
Neuromuscular Disease					
Duchenne muscular dystrophy ▲★	RGX-202				Worldwide
Neurodegenerative Disease					
Hunter syndrome (MPS II) ▲★■	RGX-121				Worldwide
Hurler syndrome (severe MPS I) ▲★■	RGX-111				Worldwide
Batten disease (CLN2) ▲★	RGX-181				Worldwide

- ▲ Orphan Drug Designation
- ★ Rare Pediatric Disease Designation
- Fast Track Designation
- AAV-mediated antibody delivery for chronic diseases
- Monogenic gene replacement



Retinal Diseases

Strategic partnership with AbbVie to develop and commercialize RGX-314, a potential one-time gene therapy for treatment of wet AMD and diabetic retinopathy



Leadership and expertise in AAV and retinal gene therapy



Strong in-house capabilities of AAV manufacturing



Leading eye care company



Global development and commercial infrastructure

Details of Partnership

- **\$370 million upfront payment** with up to **\$1.38 billion in additional development, regulatory and commercial milestones**
- Collaboration for the development and commercialization of RGX-314 with **equal share of profits in U.S. and REGENXBIO to receive royalties outside the U.S.**
- **REGENXBIO will lead the manufacturing of RGX-314** for clinical development and U.S. commercial supply



Subretinal

Phase I/IIa trial for nAMD is complete;
Long-term follow-up continues

First pivotal trial for nAMD is active and
enrolling patients



Second pivotal trial for nAMD is active and
enrolling patients



Suprachoroidal

Phase II trial in nAMD is ongoing



Phase II trial for
diabetic retinopathy is ongoing



RGX-314: Potential best-in-class, one-time gene therapy for treatment of wet age-related macular degeneration (wet AMD)

THE DISEASE

- Blurring of central vision and progressive vision loss due to formation of leaky blood vessels in the eye
- VEGF inhibitors are standard of care to treat fluid and associated vision loss
- Frequency / uncomfortable administration of current anti-VEGF therapies affects compliance and ultimately efficacy
- >2 million patients estimated in U.S., Europe and Japan

RGX-314 PRODUCT CANDIDATE



Vector: AAV8



Gene: anti-VEGF Fab

Mechanism of action

Reducing leaky blood vessel formation by giving retinal cells the ability to produce an anti-VEGF fab

Routes of administration

Subretinal (SR)

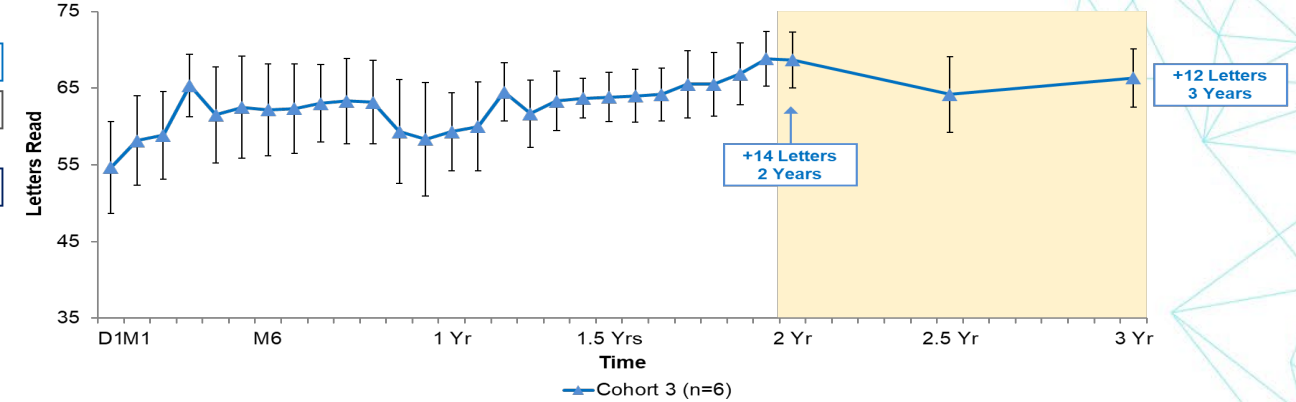
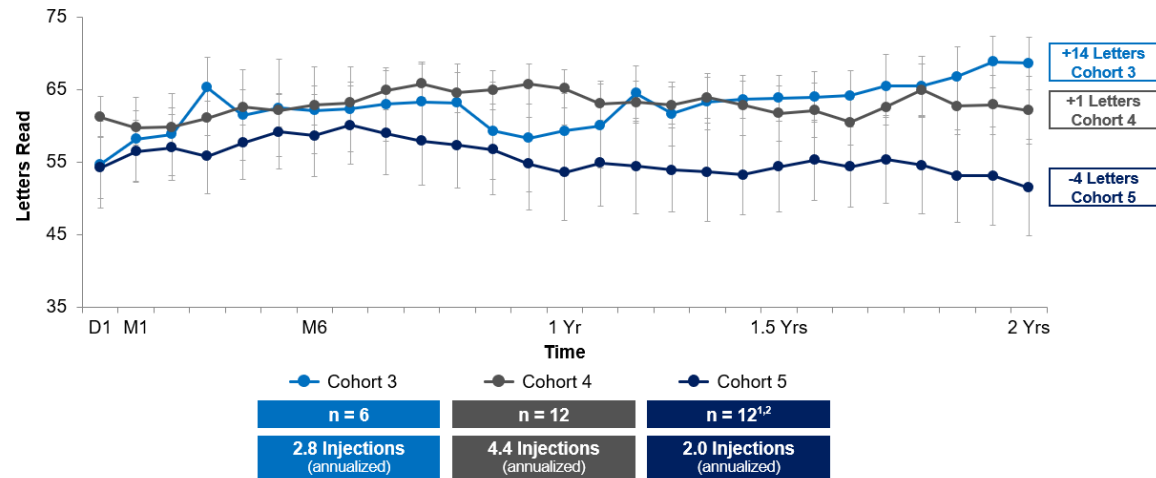


Suprachoroidal (SC)



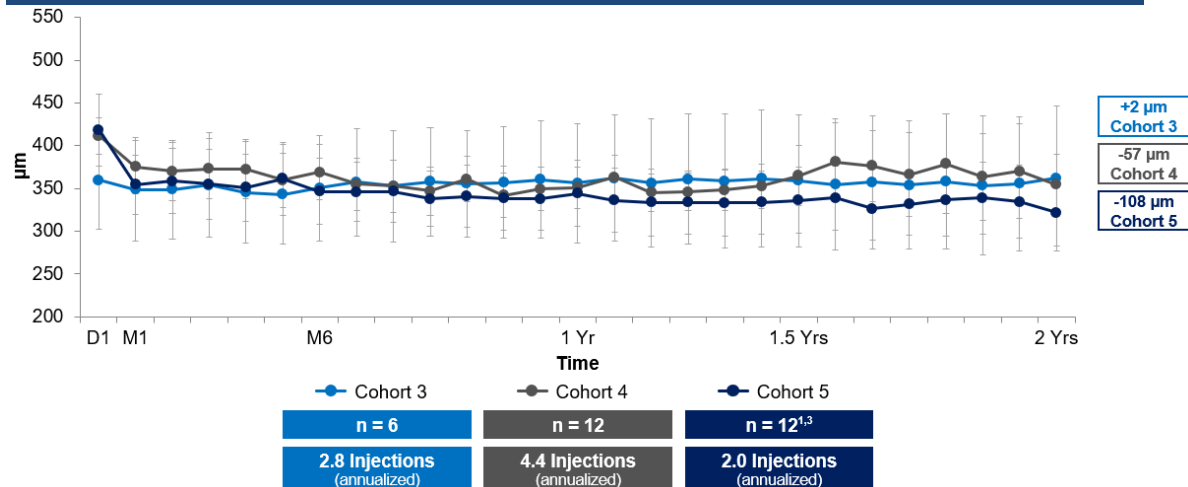
RGX-314 Phase I/IIa Trial: Stable to Improved VA, Including VA Improvement through 3 Years in Cohort 3

Best Corrected Visual Acuity (BCVA)



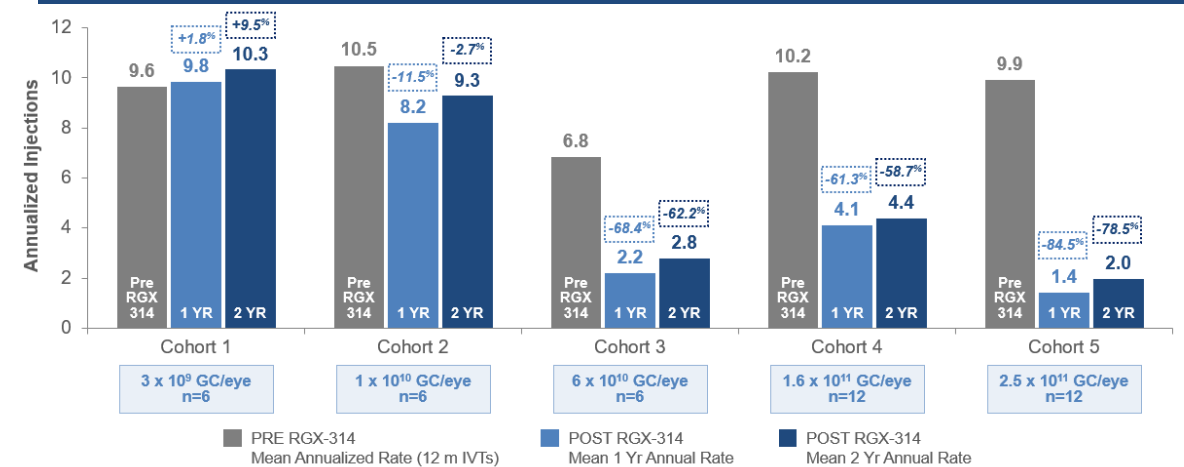
Stable to Improved Anatomy

Central Retinal Thickness (CRT) by Central Reading Center



with Meaningful Reduction in anti-VEGF Injection Burden

Annualized Injection Rate⁴



1. One patient in Cohort 5 discontinued the study prior to the Week 22 visit and missing data post discontinuation was not imputed. Another patient in Cohort 5 has missed the visits due to COVID-19 from Week 50 through Week 74 and from Week 86 through Week 94. For this patient, missing visits were imputed using last observation carried forward (LOCF). 2. Ten additional missing BCVA results were interpolated. 3. Thirteen additional missing CRT results were interpolated. 4. Prior annual rate is (Total # of prior IVTs)/(minimum(366 days, Duration between first ever IVT and Day 1)/365.25). Post RGX-314 annual rate is (Total # of IVTs on Study)/(Duration on Study/365.25) where on study is defined from RGX-314 administration to a specified cut-off date. Retreatment Criteria: Any CNV-related increased, new, or persistent fluid; Vision loss of ≥5 letters associated with fluid; New ocular hemorrhage

RGX-314 pivotal program for wet AMD: ATMOSPHERE™ and ASCENT™ clinical trials using subretinal delivery



OBJECTIVES

Primary

- Non-inferiority in the mean change in BCVA for RGX-314 compared to repeated intravitreal injections of anti-VEGF treatment at 1 year

Secondary

- Safety and tolerability of RGX-314
- Effect of RGX-314 on vision and retinal anatomy
- Additional anti-VEGF injections post-RGX-314

Subjects: approximately 765 total

Route of administration: Subretinal

Sites: Leading retinal surgery centers across the United States and Canada

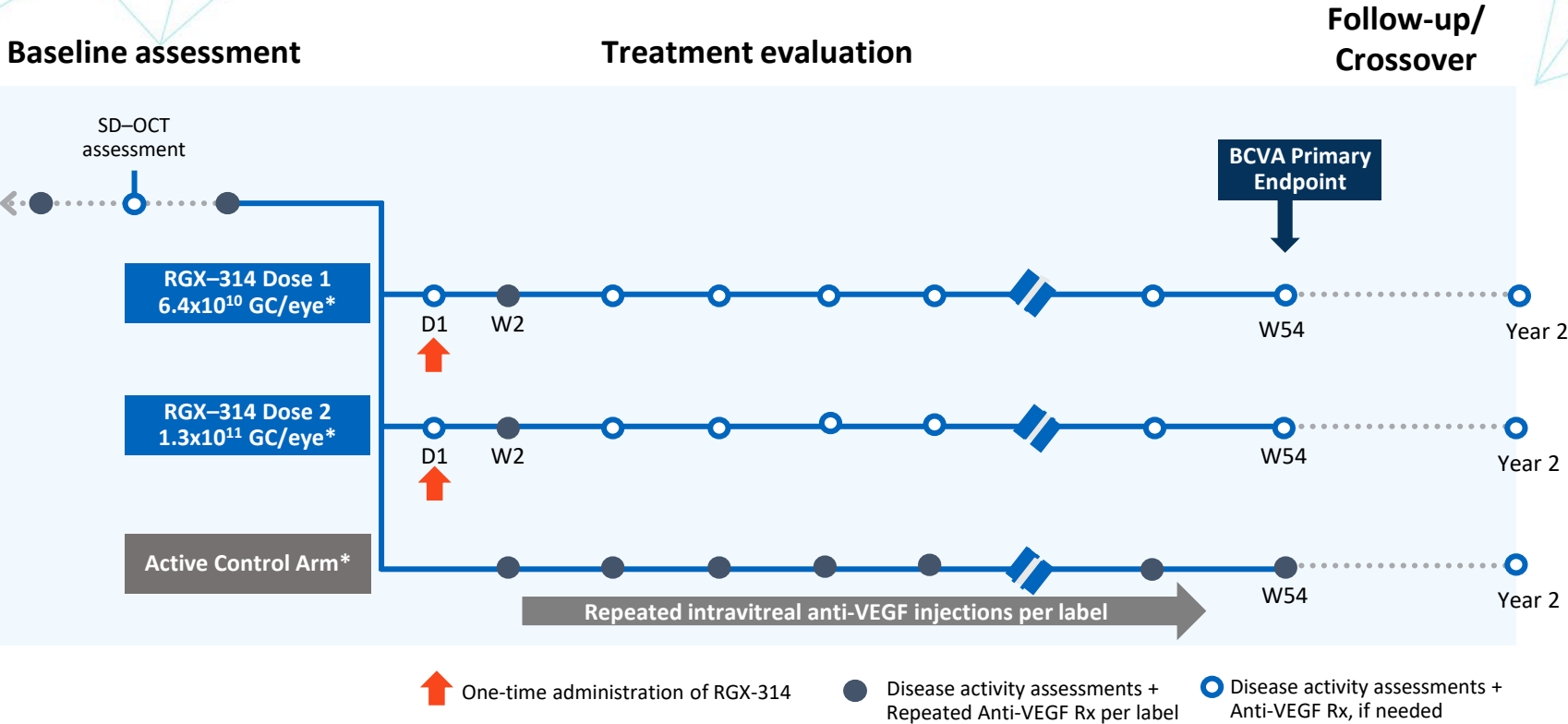


KEY INCLUSION CRITERIA

- Male or female ≥ 50 to 89 years of age
- Previously treated wet AMD subjects requiring anti-VEGF therapy
- Documented response to anti-VEGF at trial entry (assessed by SD-OCT)
- Vision of 20/32 to 20/160
- Pseudophakic (status post cataract surgery)

RGX-314 pivotal program for wet AMD: ATMOSPHERE and ASCENT trial designs

Administration and follow-up timeline



n=300 patients*

Active Control Arm:
Ranibizumab 0.5mg q4w



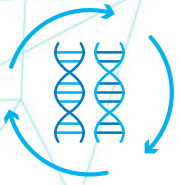
n=465 patients*

Active Control Arm:
Aflibercept 2.0mg q8W



*1:1:1 randomization

AAVIATE® Phase II clinical trial: RGX-314 for wet AMD using suprachoroidal delivery



OBJECTIVES

Primary

- To evaluate the mean change in BCVA for RGX-314 compared with ranibizumab monthly injection at Month 9

Secondary

- Safety and tolerability of RGX-314
- Change in central retinal thickness (CRT) as measured by Spectral Domain Optical Coherence Tomography (SD-OCT)
- Additional anti-VEGF injections post-RGX-314

Subjects: Up to 95 total

Route of administration: Suprachoroidal using SCS Microinjector

Sites: Fifteen leading retinal centers across the United States

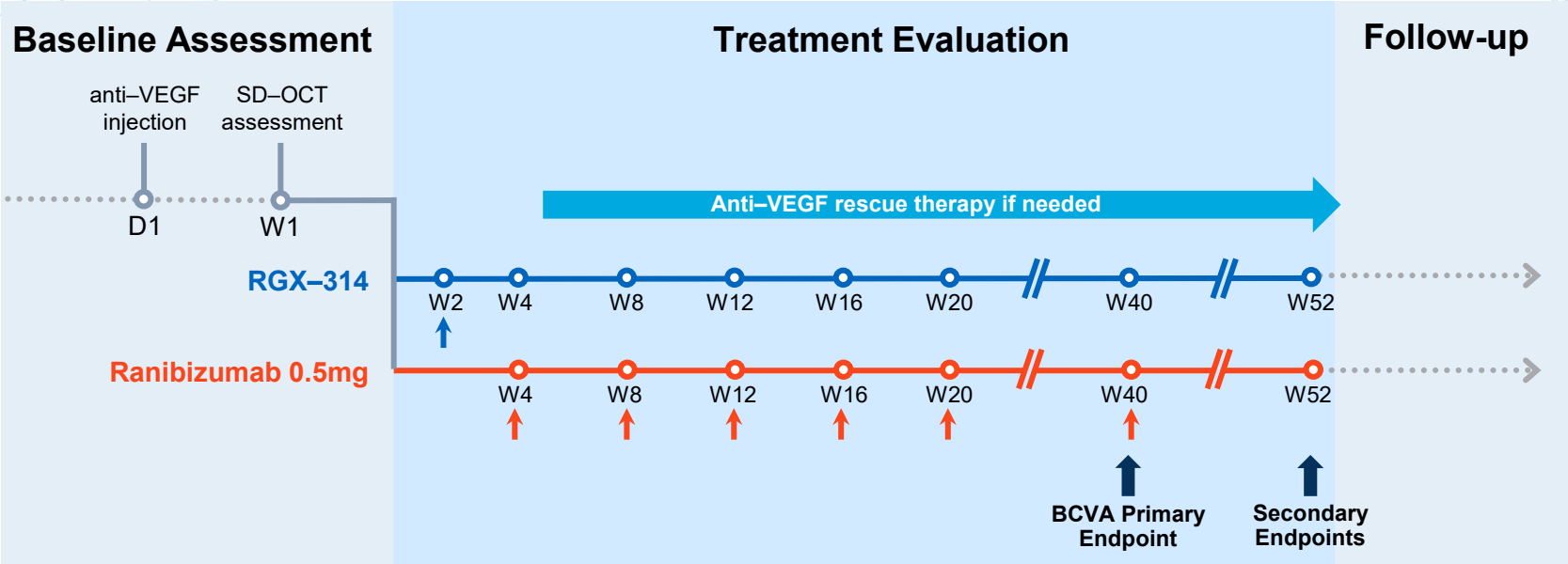


KEY INCLUSION CRITERIA

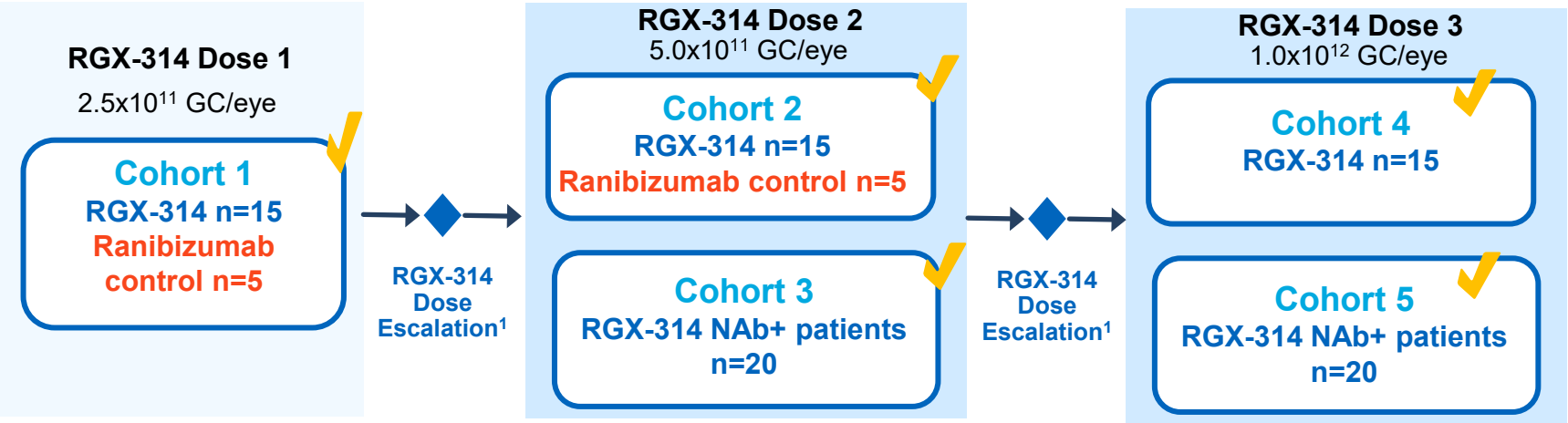
- Male or female ≥ 50 to 89 years of age
- Previously treated wet AMD subjects with fluid on OCT at trial entry
- Documented response to anti-VEGF at trial entry (assessed by reading center)
- BCVA between $\leq 20/25$ and $\geq 20/125$ (≤ 83 and ≥ 44 Early Treatment Diabetic Retinopathy Study [ETDRS] letters) in the study eye
- Phakic or pseudophakic

AAVIATE[®] Phase II clinical trial design

Administration and follow-up timeline



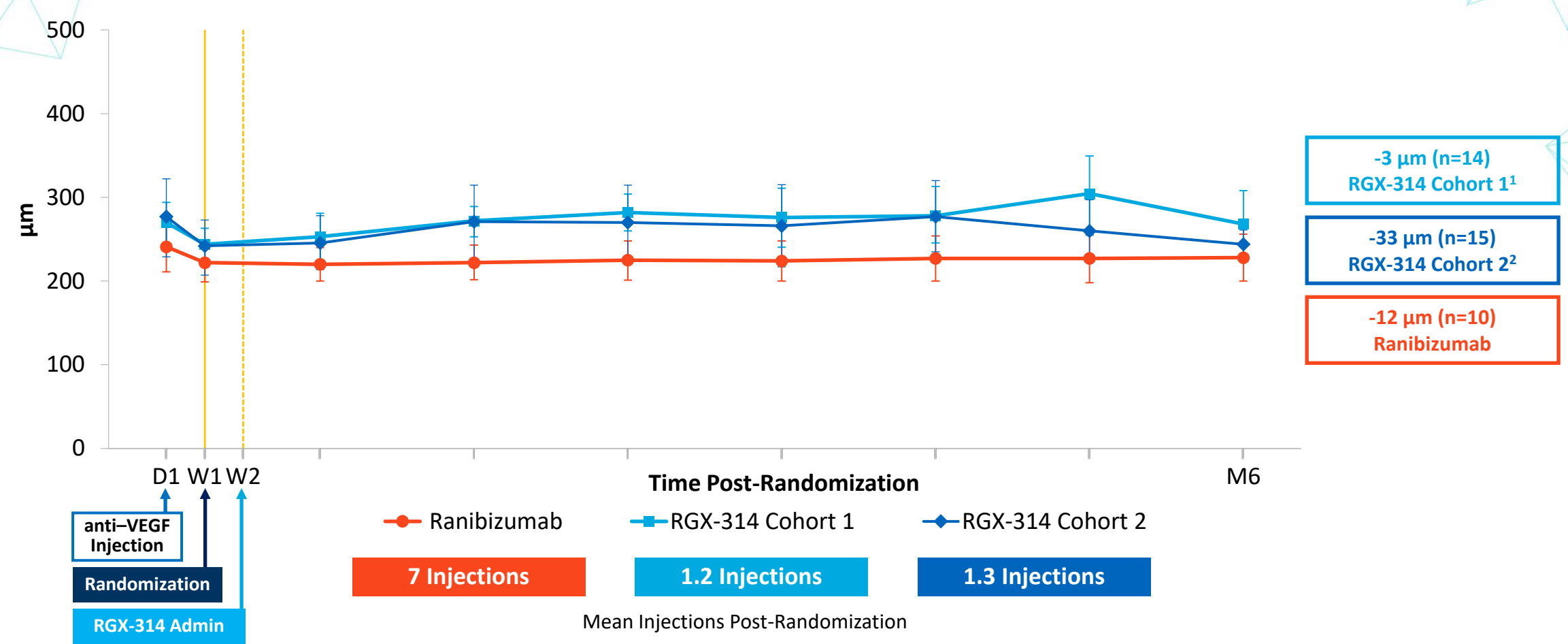
Dose escalation



¹ Dose escalation safety review to occur two weeks after final subject in Cohort 1 has been dosed
SD-OCT = spectral domain optical coherence tomography
NAb+ = AAV8 neutralizing antibody positive

Cohorts 1 and 2: Mean CRT from Day 1 (Screening) Through Month 6

Central Retinal Thickness (CRT) 95%CI

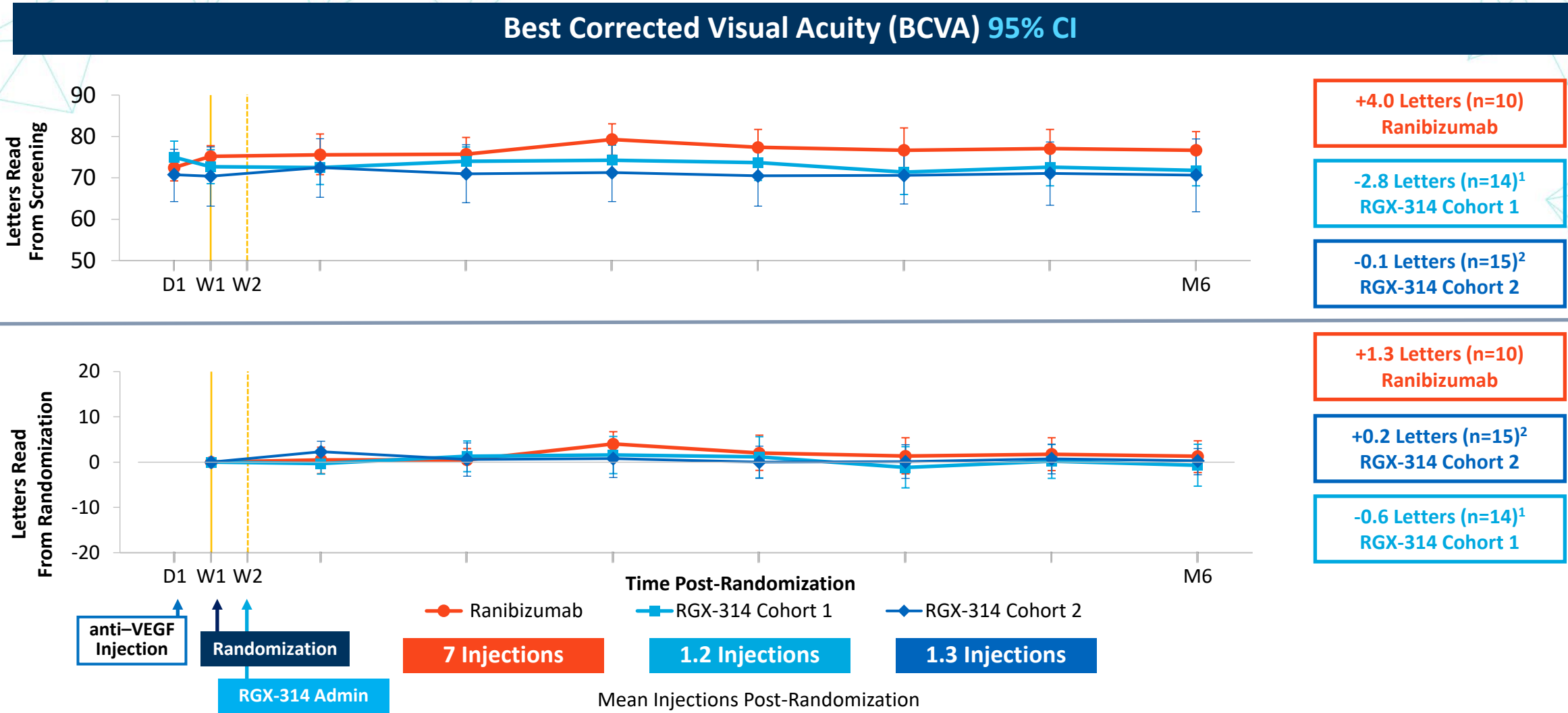


Data cut: November 4, 2021

¹One patient discontinued the study after Week 12, and only data up to week 12 is included for the subject. For one patient who has missing Weeks 8 and 28 visits, the missing data has been interpolated using the average of before and after the missing visit.

²For one patient who missed the Week 28 visit, the missing data has been interpolated using the average of before and after the missing visit.

Cohort 1 and 2: Mean Change in BCVA Through Month 6

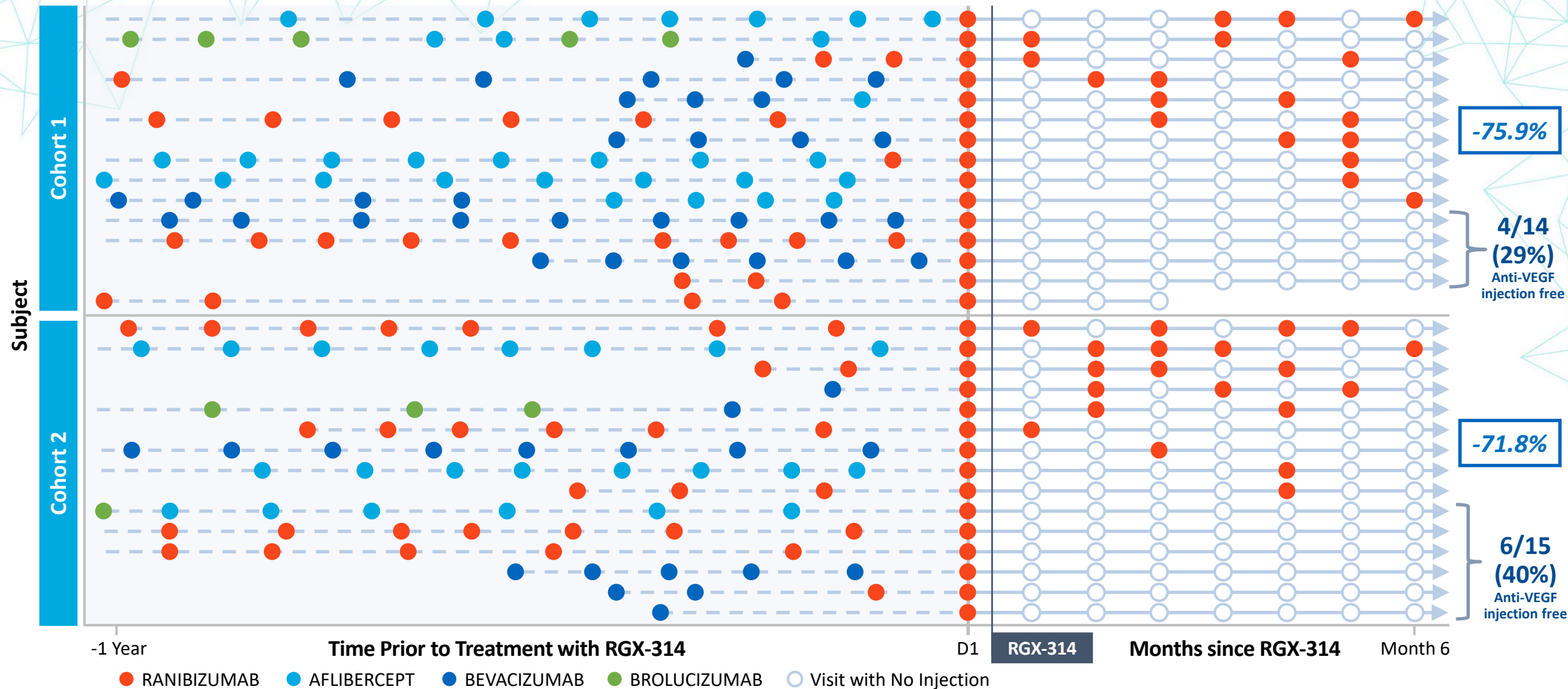


Data cut: November 4, 2021

¹One patient discontinued the study after Week 12, and only data up to week 12 is included for the subject. For one patient who has missing Weeks 8 and 28 visits, the missing data has been interpolated using the average of before and after the missing visit.

²For one patient who missed the Week 28 visit, the missing data has been interpolated using the average of before and after the missing visit.

Cohort 1 and 2 Injections: Pre and Post RGX-314 (n=15)



Change in annualized injection rate is the difference between historical annualized injection rate and on-study annualized injection rate up to 6 months post-RGX-314. Historical annualized injection rate is (Total # of prior injections)/(minimum(366 days, Duration between first injection and Day 1)/365.25). On-study annualized injection rate is (Total # of injections on Study)/(Duration on Study/365.25) where on-study is defined from post-D1 to a specified cut-off date.

AAVIATE Safety Summary

- RGX-314 was well-tolerated in Cohorts 1–3 (n=50) with follow-up ranging from 2 – 12 months
 - 4 SAEs: None considered drug-related
 - No cases of chorioretinal vasculitis or occlusion, or hypotony were observed

RGX-314 Common Ocular TEAEs¹ in the Study Eye through 6 Months:	Cohort 1 2.5x10¹¹ GC/eye 1 injection (N=15)	Cohort 2 5.0x10¹¹ GC/eye 2 injections (N=15)	Total (N=30)
Conjunctival hemorrhage	5 (33.3%)	3 (20.0%)	8 (26.7%)
Intraocular Inflammation ²	4 (26.7%)	3 (20.0%)	7 (23.3%)
Worsening of nAMD ³	3 (20.0%)	1 (6.7%)	4 (13.3%)
Dry eye	2 (13.3%)	2 (13.3%)	4 (13.3%)
Episcleritis ⁴	0 (0.0%)	3 (20.0%)	3 (10.0%)
Conjunctival hyperemia	2 (13.3%)	1 (6.7%)	3 (10.0%)

Data cut: November 4, 2021

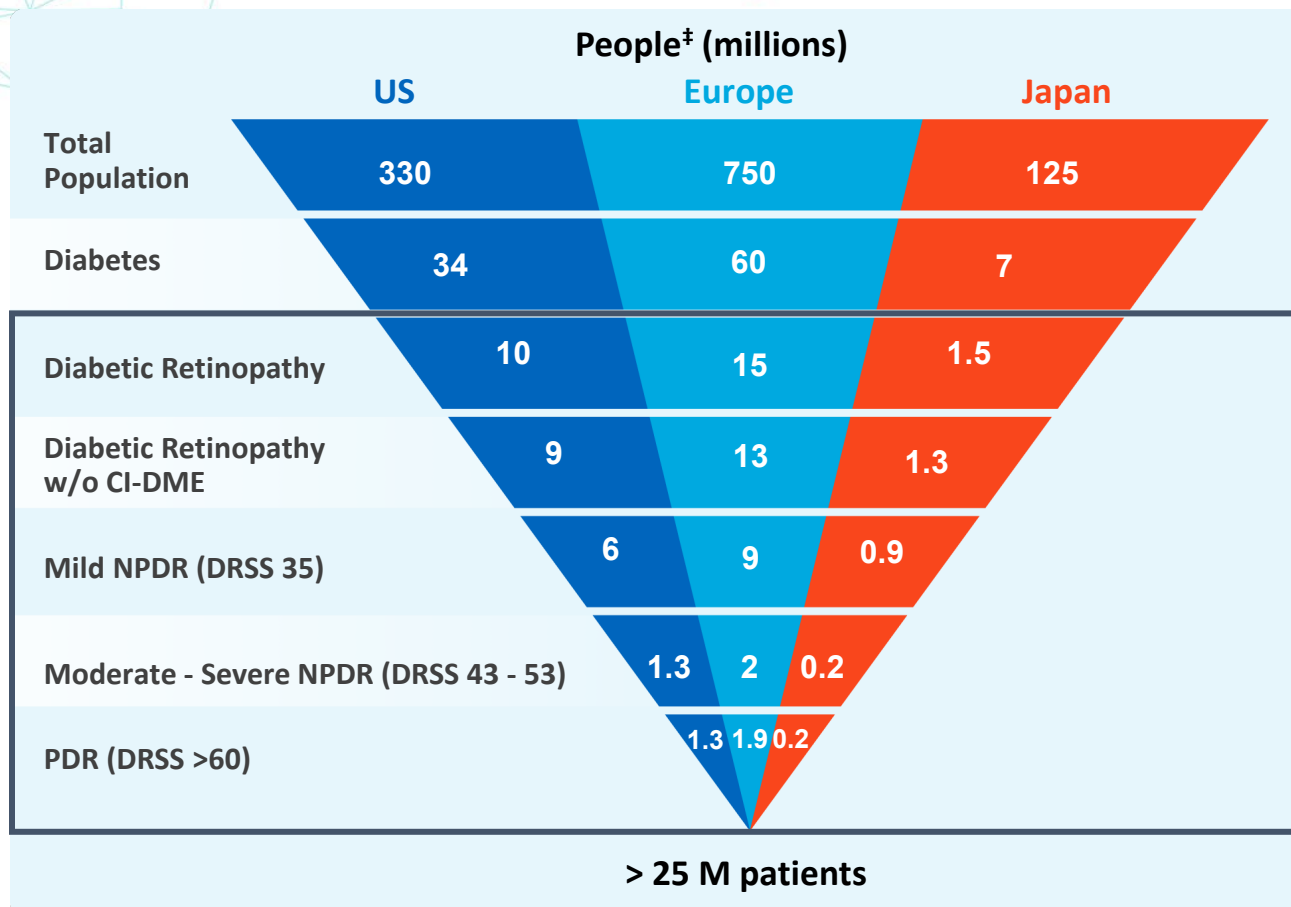
1. Includes AEs for total group ≥10% with onset up to 6m visit.

2. All mild, observed on slit lamp examination. Cohort 1: 3 patients presented with anterior cell (+0.5, +2, +2) and 1 patient presented with vitreous cell (trace). Cohort 2: 3 patients presented with anterior cell (+0.5, +1, +1). Resolved within days to weeks on topical corticosteroids.

3. All reported at one site.

4. All mild, presented 4 weeks post double injection and resolved within days to weeks on topical corticosteroid or NSAID treatment.

Diabetic Retinopathy is a Global Public Health Problem



Leading cause of blindness among working-age adults¹

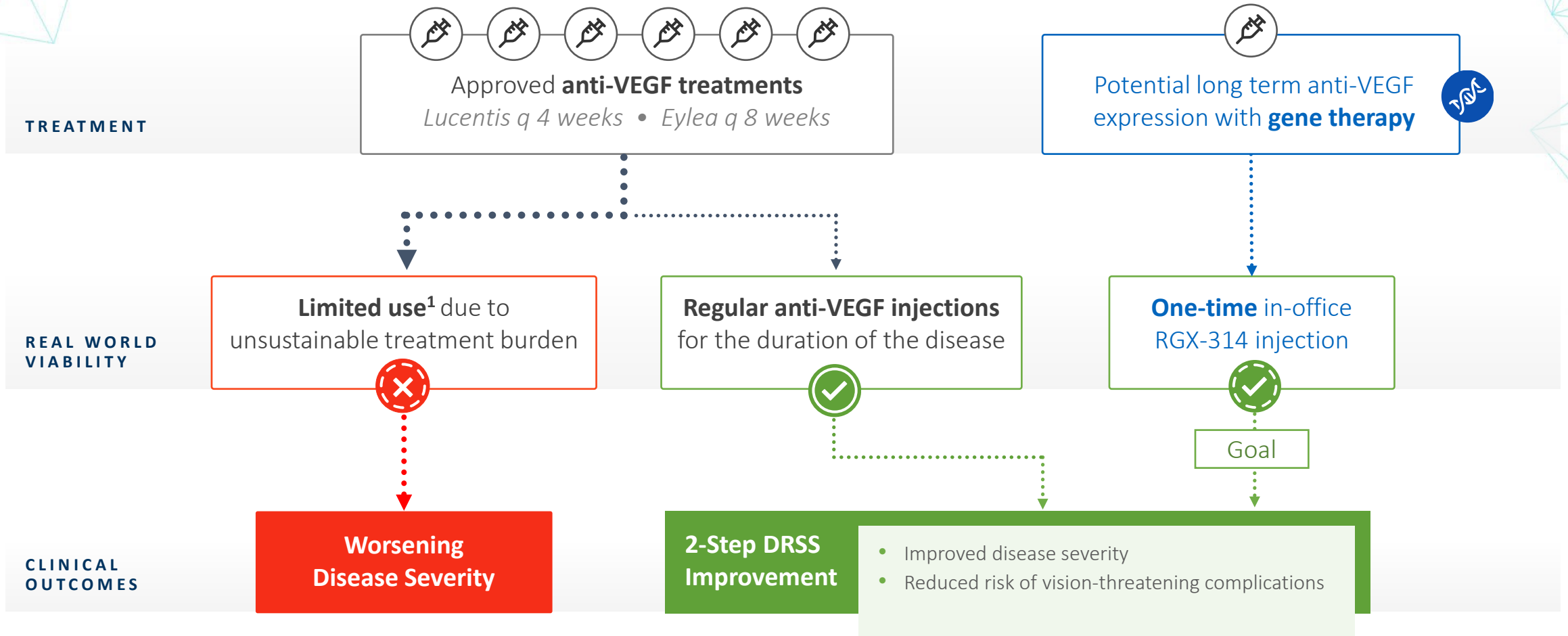


Chronic, frequent treatment with anti-VEGF has been shown to improve DR severity and reduce risk of progression to vision threatening complications (VTCs) by > 70%²



Majority of DR patients without VTCs are not treated with anti-VEGF in the real world due to the unsustainable treatment burden of regular injections in the eye.^{3,4}

A single in-office injection of RGX-314 has the potential to provide long-term foundational anti-VEGF therapy to prevent progression of diabetic retinopathy and associated vision-threatening complications



ALTITUDE™ Phase II clinical trial in DR



OBJECTIVES

Primary

- Evaluate proportion of patients with ≥ 2 step improvement in severity on the Diabetic Retinopathy Severity Scale (DRSS) at 1 year

Secondary

- Safety and tolerability of RGX-314
- Development of DR-related ocular complications
- Need for additional standard of care interventions

Subjects: Up to 60 total

Route of administration: Suprachoroidal using SCS Microinjector

Sites: 18 leading retinal centers across the United States

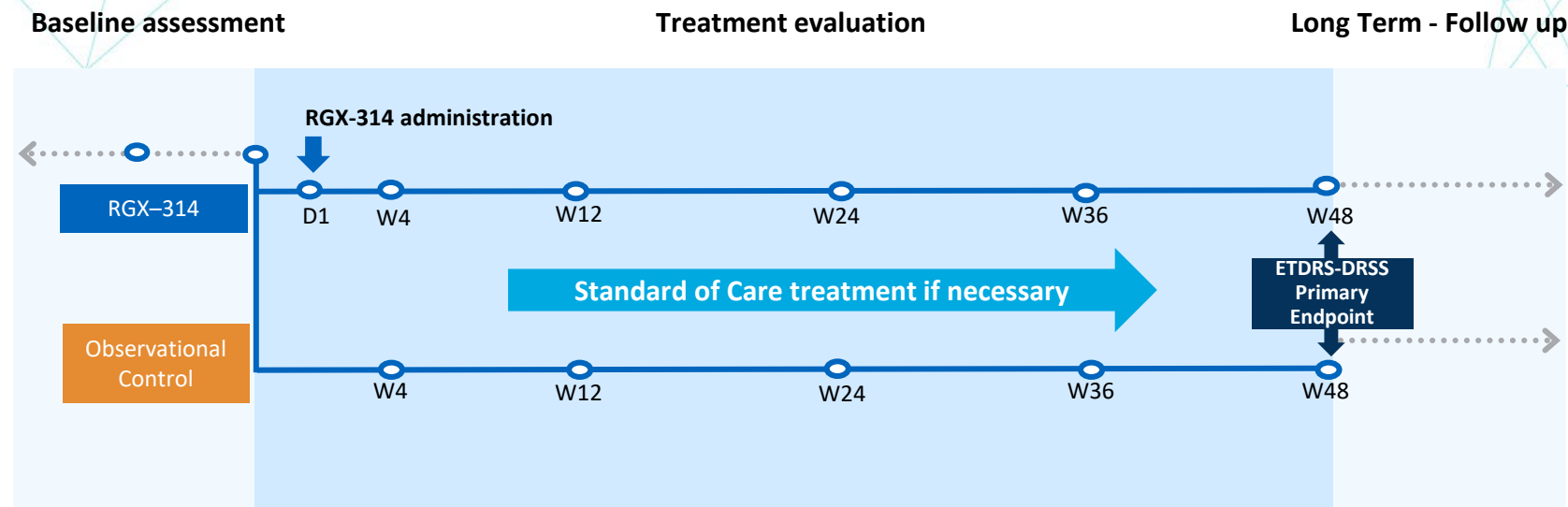


KEY INCLUSION CRITERIA

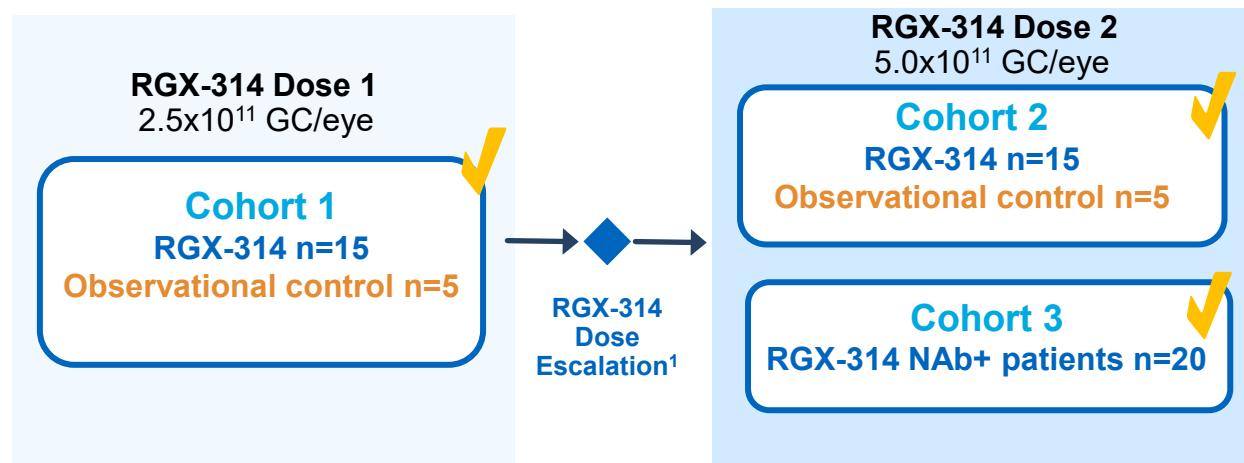
- Male or female ≥ 25 to 89 years of age with DR secondary to diabetes mellitus Type 1 or Type 2
- Moderately severe NPDR, severe NPDR, or Mild PDR (DRSS levels 47-61)
- No active CI-DME, CST $< 320 \mu\text{m}$
- Vision of 20/40 or better (≥ 69 Early Treatment Diabetic Retinopathy Study [ETDRS] letters) in the study eye
- No anti-VEGF injection(s) in prior 6 months

ALTITUDE™ Phase II clinical trial design

Administration and follow-up timeline

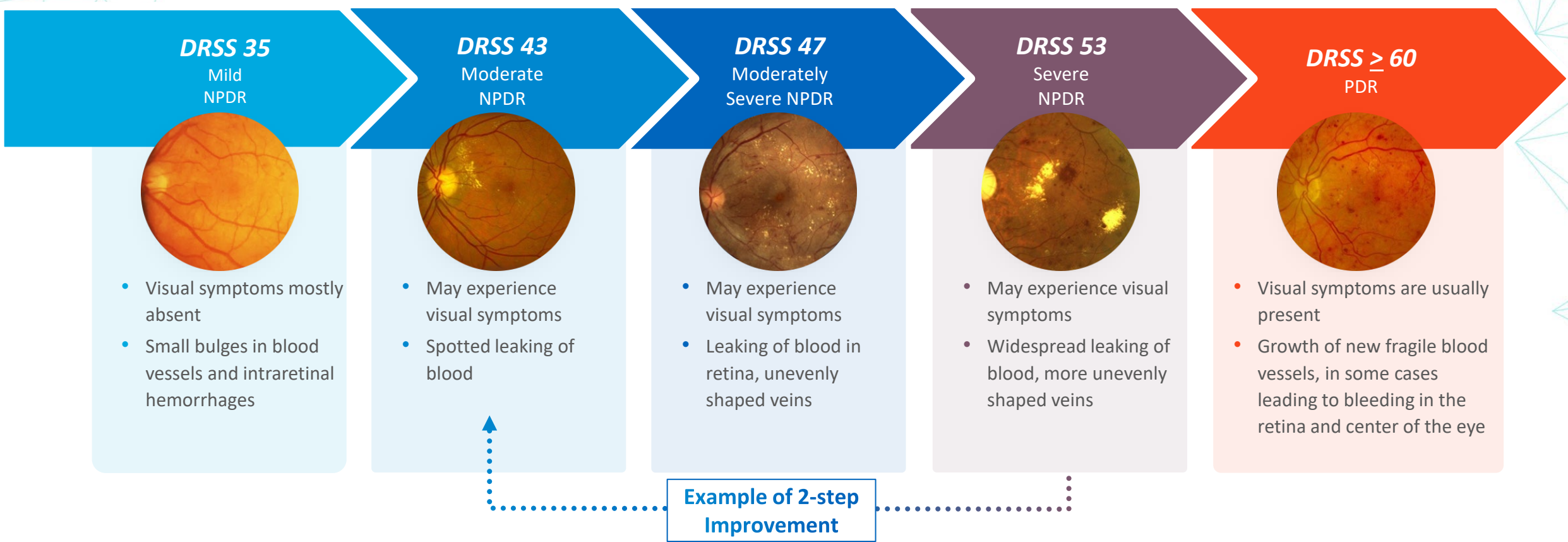


Dose escalation



A 2-step improvement in Diabetic Retinopathy Severity Scale (DRSS) has been accepted as a pivotal endpoint by the FDA for DR clinical trials¹

► INCREASING RISK OF DEVELOPING VISION THREATENING COMPLICATIONS ►

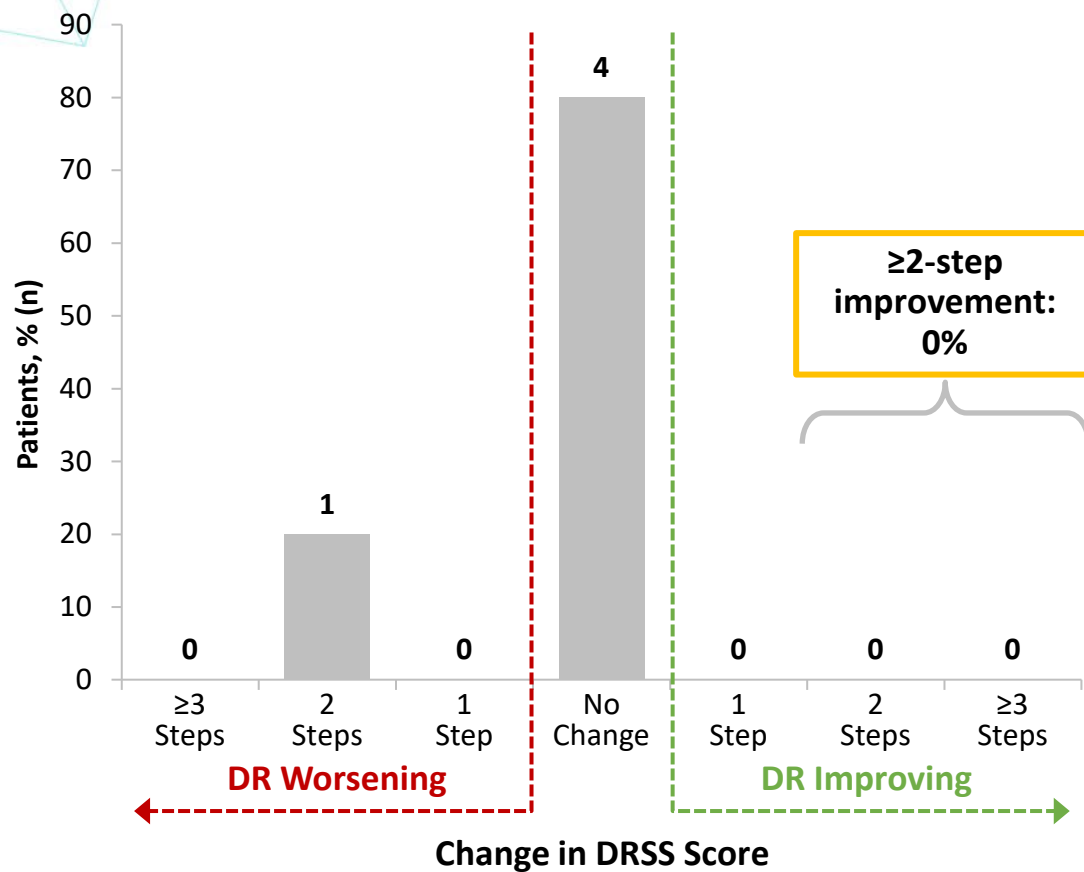


DR disease severity is measured using the Diabetic Retinopathy Severity Scale ²

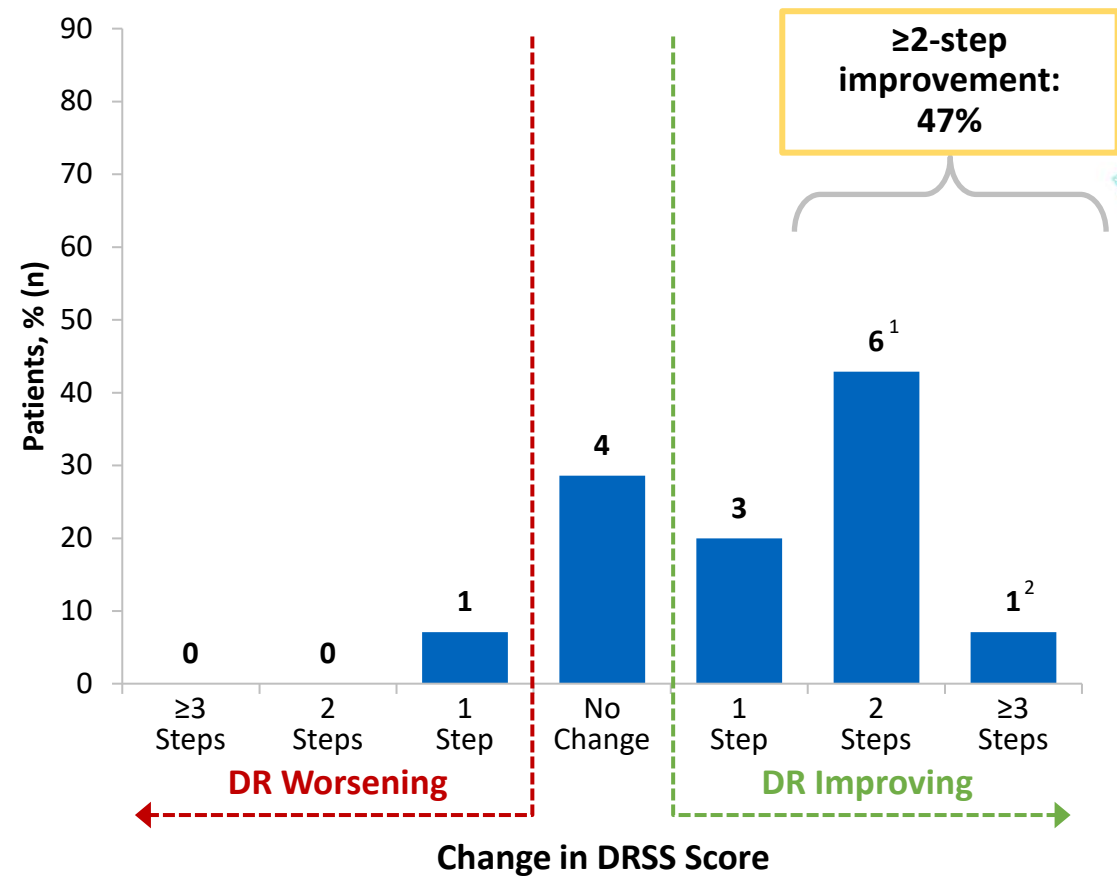
Cohort 1: Change in DRSS at Month 6

47% of RGX-314 Treated Patients Achieved a ≥ 2 -Step Improvement in Disease Severity

Observational Control (n=5)



RGX-314 (n=15)



A 2-step improvement in DRSS has been accepted as a **pivotal endpoint** by the **FDA** for **DR clinical trials**³

Data cut: January 18, 2022



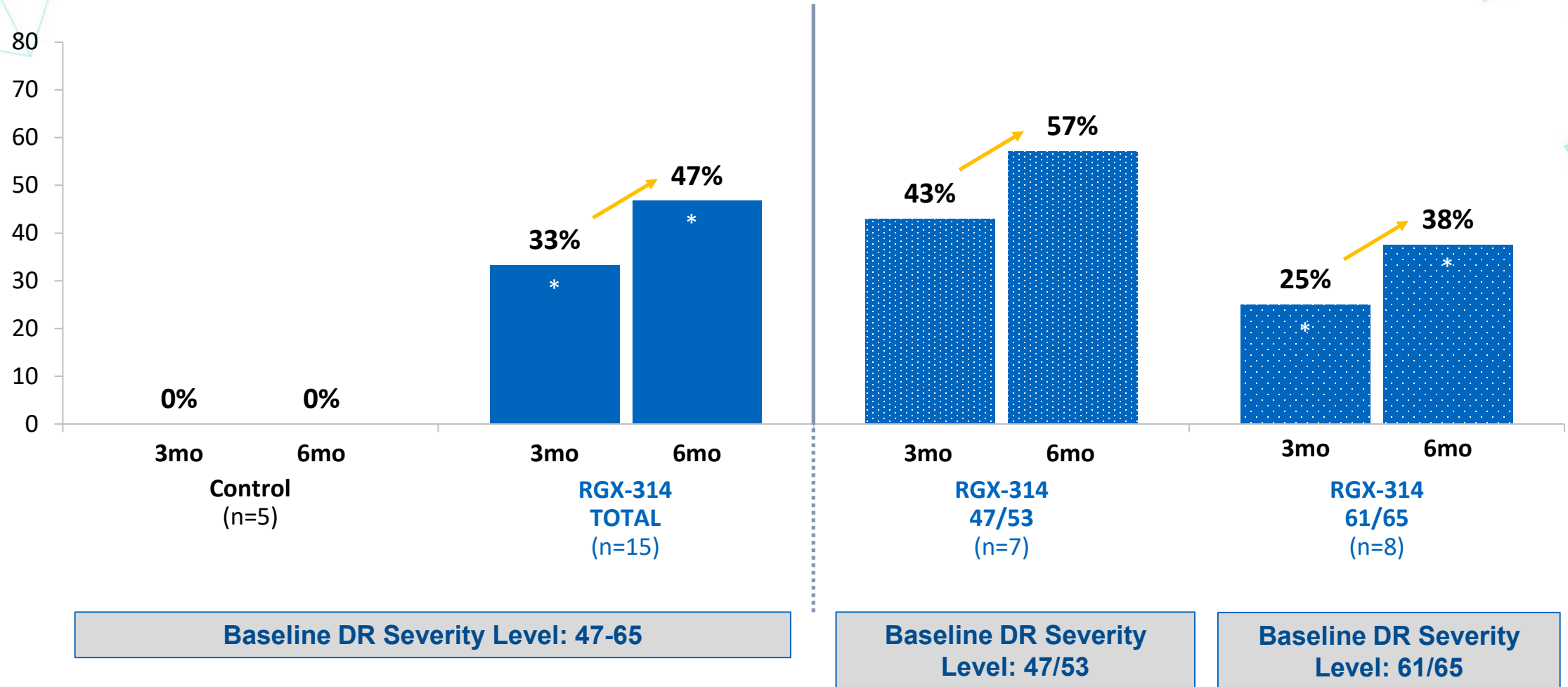
1. One study eye (DRSS 61 at baseline) received a single Lucentis injection 8 days after RGX-314 dosing for trace vitreous hemorrhage, which was 10 weeks prior to their 3 month visit when DRSS was assessed.

2. One patient had a 4-step improvement.

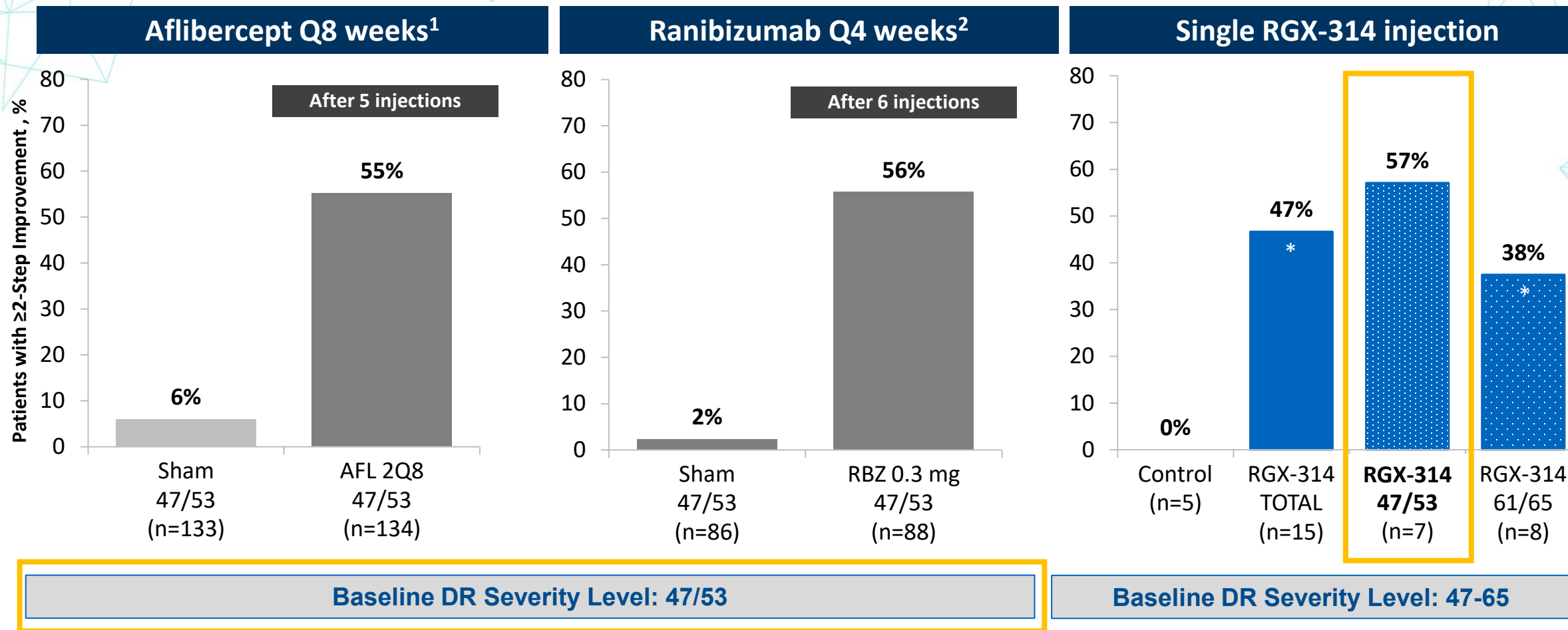
3. Used in the approval of EYLEA® (aflibercept) and LUCENTIS® (ranibizumab) Source: AAO PPP 2019

Patients with ≥ 2 Step Improvement in Disease Severity at Months 3 and 6

Cohort 1 RGX-314



How Do ALTITUDE Cohort 1 DRSS Outcomes at 6 Months Compare to Frequent Injections of FDA-Approved Anti-VEGF?



Data cut: January 18, 2022

*One patient had a 4-step improvement. Another patient received a single Lucentis injection in the study eye (DRSS 61 at baseline) 8 days after RGX-314 dosing for trace vitreous hemorrhage, which was 10 weeks prior to their 3 month visit when DRSS was assessed.

1. Patients initially received 5 Q4 weeks loading doses followed thereafter by Q8 weeks dosing, per U.S. label instructions; EYLEA® (aflibercept) Injection full U.S. Prescribing Information. Regeneron Pharmaceuticals, Inc. March 2021.

2. Patients received Q4 weeks dosing of ranibizumab (RBZ), per U.S. label instructions; Wykoff CC et al. *Ophthalmology Retina*. 2018 DOI: (10.1016/j.oret.2018.06.005).

ALTITUDE Safety Summary: Cohort 1

- RGX-314 was **well-tolerated** (n=15)
 - 2 SAEs: not considered drug-related
 - Vitreous hemorrhage in an untreated *fellow eye*
 - Femur fracture
- **Common ocular TEAEs¹ in the study eye were not considered drug-related and were predominantly mild:**
 - Conjunctival hyperemia (3/15, 20%)
 - Conjunctival hemorrhage (2/15, 13%)
- One case of mild episcleritis reported 2-weeks post-dosing and resolved with topical corticosteroids
- **No intraocular inflammation** observed
 - No prophylactic corticosteroids administered
- **Stable BCVA**

	Observational Control (N=5)	Cohort 1 2.5x10 ¹¹ GC/eye (N=15)
Mean change in BCVA at M6	-2.0 letters	+0.3 letters

Rare diseases



RGX-202 for treatment of Duchenne muscular dystrophy (Duchenne)

THE DISEASE

- Duchenne is caused by mutations in the *DMD* gene which encodes dystrophin, a protein involved in muscle contraction and strength
- Without dystrophin, muscles throughout the body degenerate and become weak, eventually leading to loss of movement and independence, required support for breathing, cardiomyopathy and premature death
- Affects 1 in 3,500 to 5,000 male births worldwide
- RGX-202 has received Orphan Drug Designation and Rare Pediatric Disease Designation by the FDA

RGX-202 PRODUCT CANDIDATE



Vector: AAV8



Transgene: microdystrophin

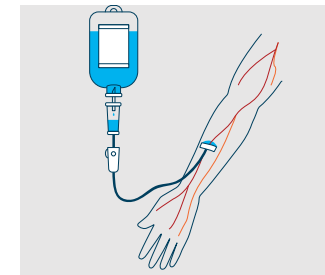
Designation: Orphan Drug Designation

Mechanism of action

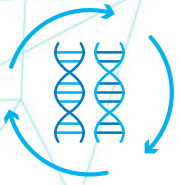
Delivers a transgene for a novel microdystrophin that includes the functional elements of the C-Terminal domain found in naturally occurring dystrophin

Route of administration

Intravenous to target muscle



AFFINITY DUCHENNE™ Phase I/II clinical trial



OBJECTIVES

Primary

- Safety and tolerability of RGX-202 in patients with Duchenne

Secondary and Exploratory

- Microdystrophin protein expression levels in muscle at 3 months¹
- Muscle strength and functional assessments, including North Star Ambulatory Assessment
- Muscle MRI

Subjects: Up to 18 total

- 2 dose cohorts of 3 patients each
- Option to dose up to 6 additional patients in each cohort in dose expansion phase

Sites: US sites, with additional sites in Canada and Europe expected to follow



¹ As assessed by muscle biopsy in first 3 patients of each cohort



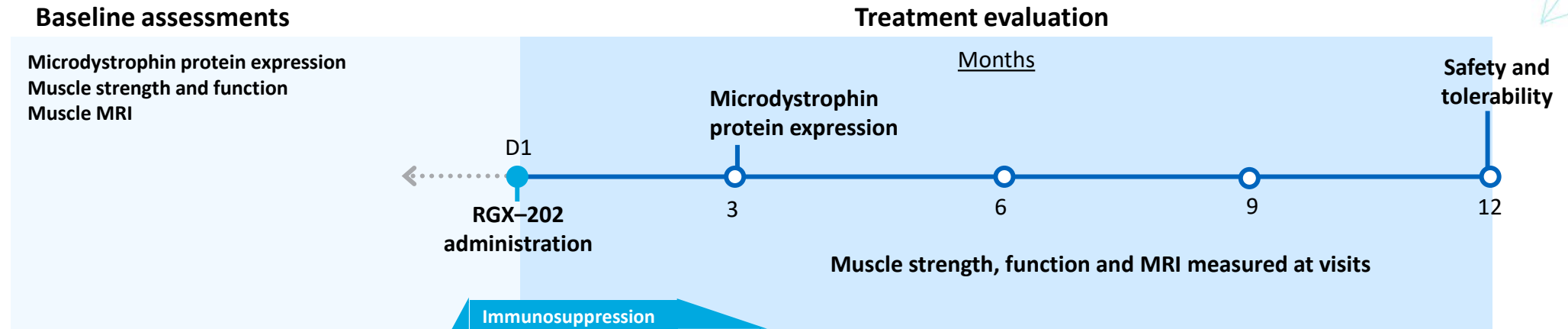
KEY INCLUSION CRITERIA and SAFETY MEASURES

- Males 4 to 11 years
- Ambulatory function
- *DMD* gene mutation between exons 18-58
- Negative for anti-AAV8 antibodies

-
- Comprehensive, short-term, prophylactic immunosuppression regimen
 - Prednisolone, Sirolimus and Eculizumab initiated prior to RGX-202 administration, to proactively mitigate potential complement-mediated immunologic responses

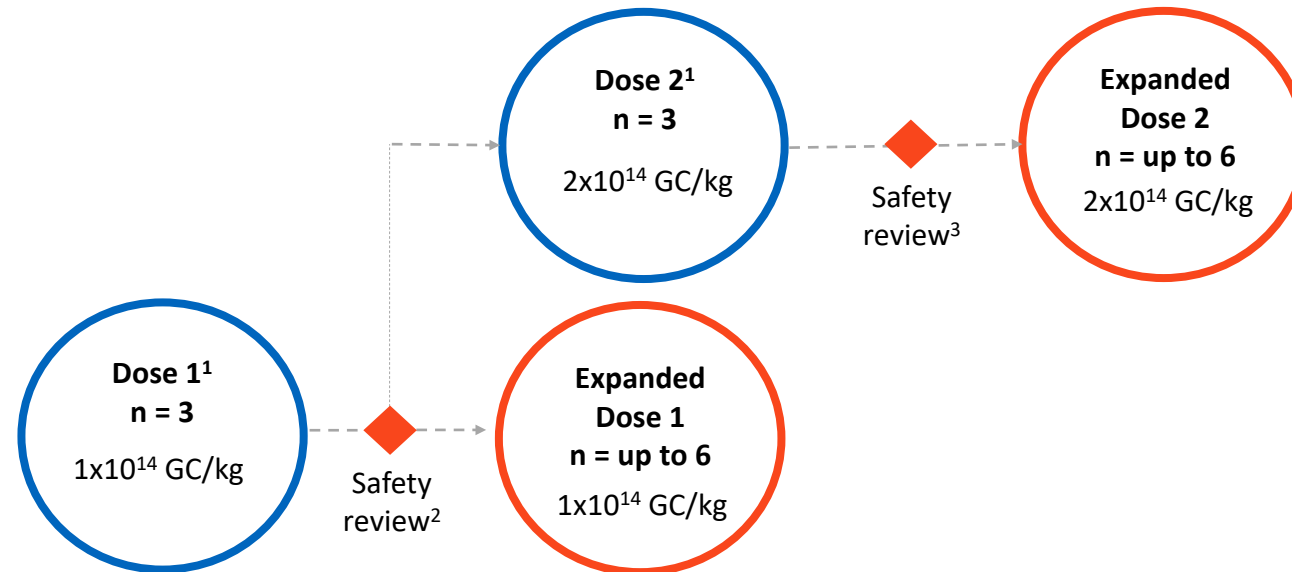
AFFINITY DUCHENNE™ clinical trial design

Administration and follow-up timeline



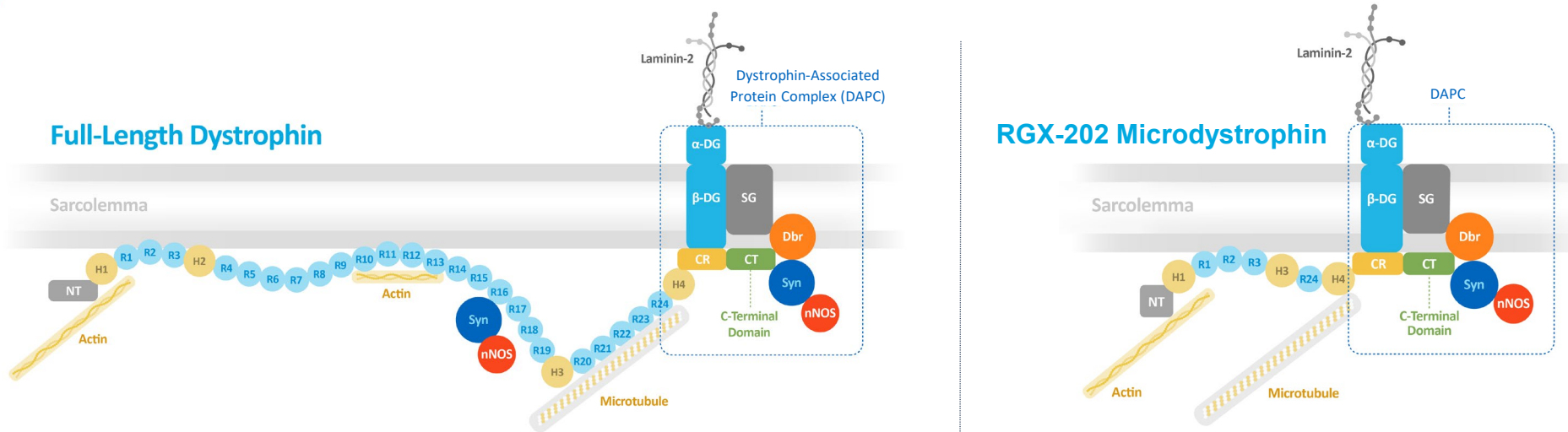
Dose escalation and dose expansion

Trial expected to initiate in 1H 2023



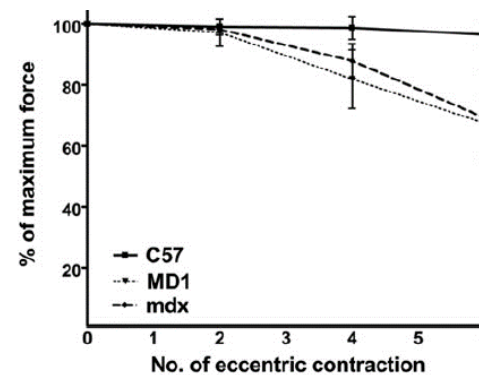
RGX-202 microdystrophin is designed to retain key elements of full-length dystrophin

CT Domain recruits several key proteins to the muscle cell membrane (sarcolemma) including Syntrophin and Dystrobrevin, Neuronal nitric oxide synthase and other proteins¹

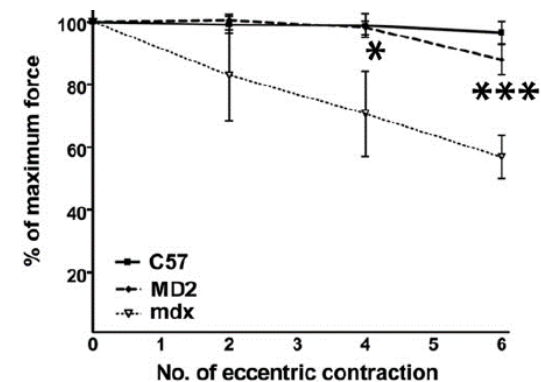


Presence of CT Domain in microdystrophin significantly improved the muscle resistance to lengthening contraction-induced muscle damage in *mdx* mice²

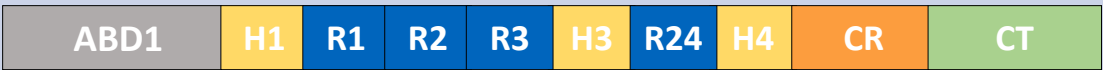

Construct without C-Terminal Domain



Construct with C-Terminal Domain



RGX-202 program has several features that provide potential benefits

	Capsid	Promoter	Microdystrophin transgene design	Transgene Size (bp)
RGX-202	AAV8	Spc5-12		4,734
Other Investigational Intervention (Example)				

ABD1: Actin Binding Domain 1

RGX-202 Features

Potential Benefits

Transgene for a novel microdystrophin includes extended coding region of dystrophin C-Terminal (CT) Domain	CT domain recruits key proteins, leading to improved muscle resistance ¹
Codon optimization and CpG content reduction	May improve gene expression, increase translational efficiency and reduce immunogenicity ²
NAV AAV8 vector and Spc5-12 muscle specific promoter	Designed to support the delivery and targeted expression of genes throughout skeletal and heart muscle ^{3, 4, 5}
Commercial-scale cGMP material already produced	Material to be used in AFFINITY DUCHENNE

¹ Koo et al, *Human Gene Therapy*, 2011

² Faust, et al. *Journal of Clinical Investigation*, 2013

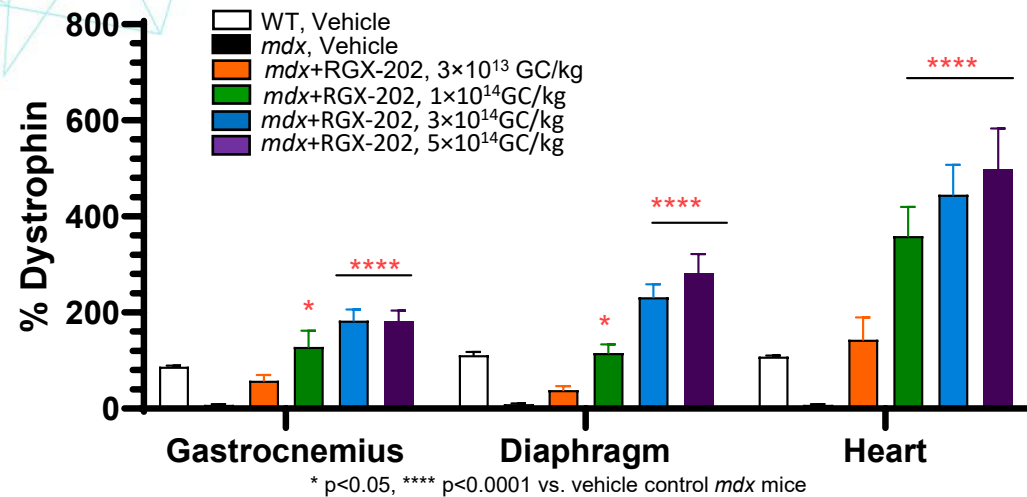
³ Le Guiner, et al. *Nature Communications*, 2017

⁴ Mack, et al. *Molecular Therapy*, 2017

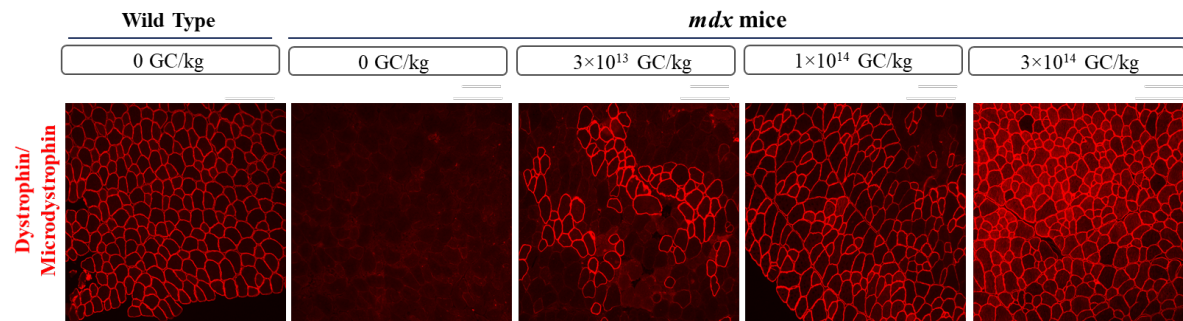
⁵ Shieh, et al. ASGCT 2019

RGX-202 demonstrated robust expression of microdystrophin across skeletal and cardiac muscles along with recruitment of key proteins to the DAPC

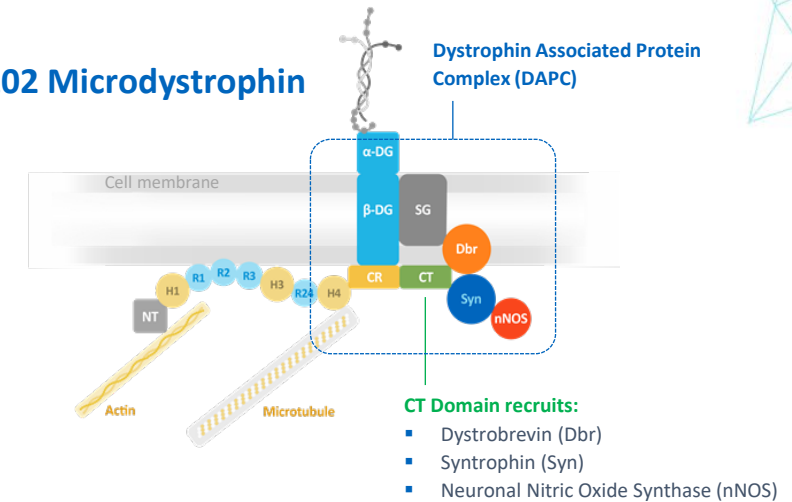
RGX-202 Microdystrophin Expression in Muscle¹



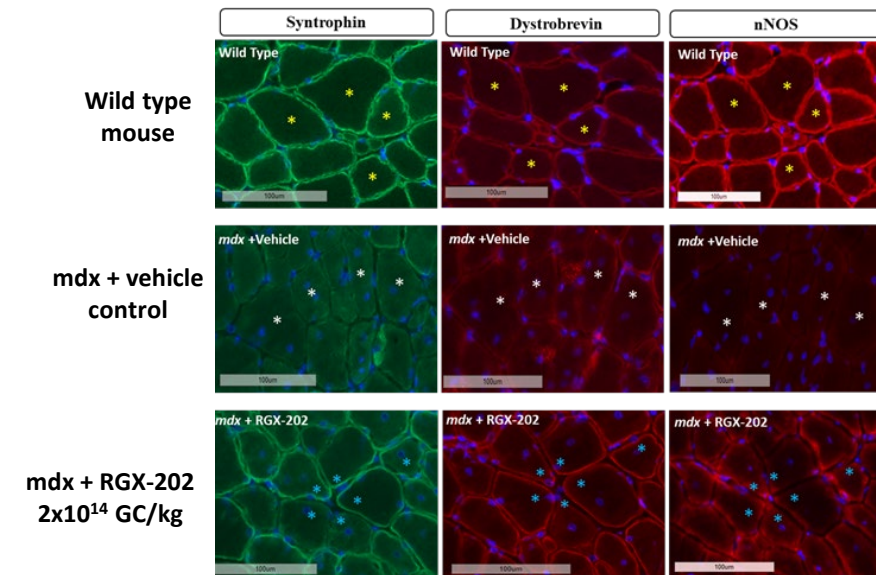
Immunohistochemistry of RGX-202 Microdystrophin in Muscle²



RGX-202 Microdystrophin

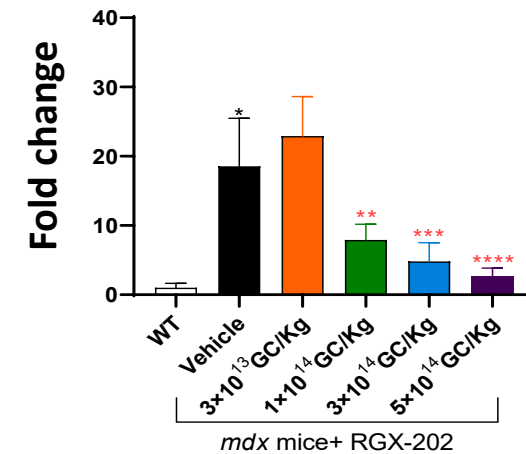
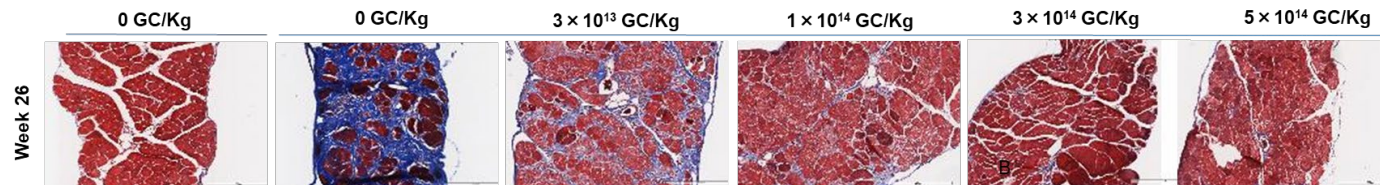


Immunohistochemistry of Dystrophin Protein Complex in Muscle¹

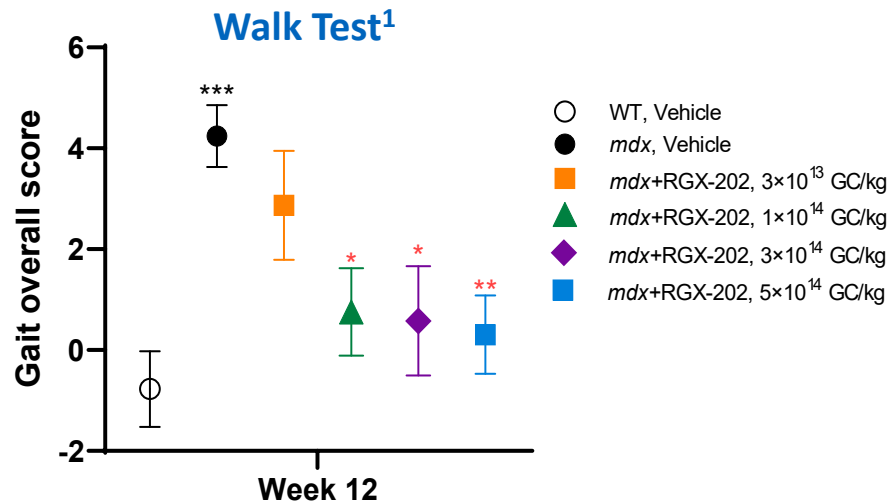


RGX-202 demonstrated significant improvements in muscle pathology and function in *mdx* mice at doses $\geq 1 \times 10^{14}$ GC/kg

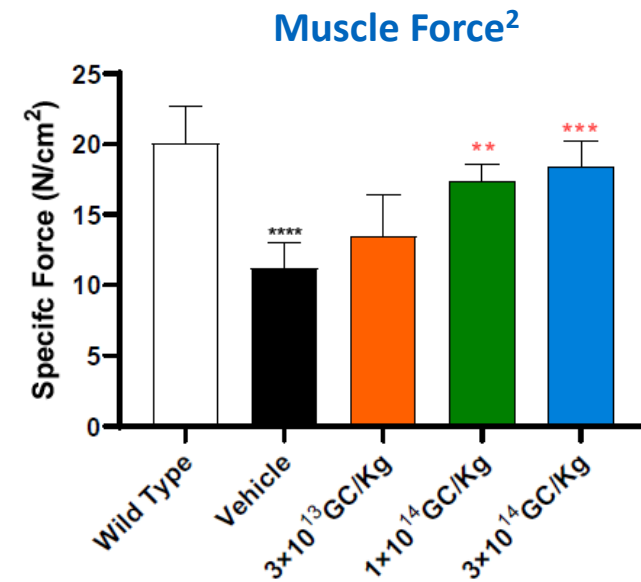
Muscle Pathology (Fibrosis)¹



*p<0.05 vs. wild type; ** p<0.01, *** p<0.001, **** p<0.0001 vs. vehicle control *mdx* mice.



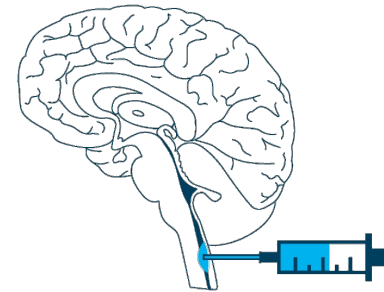
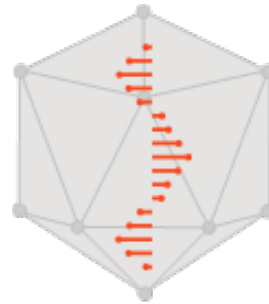
*p < 0.05, *** p < 0.001 vs. wild type vehicle (RM two-way ANOVA, Sidak's post hoc); * p < 0.05, ** p < 0.01 vs. *mdx* vehicle (Mixed effects model ANOVA, Dunnett's post hoc). Data are presented as mean \pm SEM



*p<0.05, **** p < 0.0001, vs. wild type vehicle. *p < 0.05, ** p < 0.01, *** p < 0.001, **** p < 0.0001 vs. *mdx* vehicle. Comparisons are by 1-way ANOVA or Tukey or 2-way ANOVA and Tukey

REGENXBIO's neurodegenerative disease franchise

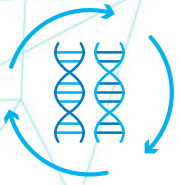
AAV9 vector



**Intracisternal
Delivery**

	RGX-121 for MPS II	RGX-111 for MPS I	RGX-181 for CLN2 Disease
Disease	<ul style="list-style-type: none"> Reduced ability to process glycosaminoglycans (GAGs), leading to neurodegeneration and early death X-linked recessive disease Available treatment is inadequate to treat neurodegeneration More than 500 patients born annually worldwide 	<ul style="list-style-type: none"> Reduced ability to process GAGs, leading to neurodegeneration and early death Autosomal recessive disease Available treatment is inadequate to treat neurodegeneration; stem cell transplant partially effective More than 500 patients born annually worldwide 	<ul style="list-style-type: none"> Reduced ability to process cellular waste peptides, leading to seizures, vision loss, neurodegeneration and early death Autosomal recessive disease Available treatment requires frequent ICV infusions of ERT, shown to stabilize some but not all disease manifestations Approximately 500 patients born annually worldwide
Gene	IDS Gene Replacement	IDUA Gene Replacement	TPP1 Gene Replacement
FDA Designations	<ul style="list-style-type: none"> ▲ Orphan Drug Designation ★ Rare Pediatric Disease Designation ■ Fast Track Designation 	<ul style="list-style-type: none"> ▲ Orphan Drug Designation ★ Rare Pediatric Disease Designation ■ Fast Track Designation 	<ul style="list-style-type: none"> ▲ Orphan Drug Designation ★ Rare Pediatric Disease Designation

RGX-121 Phase I/II clinical trial in MPS II



OBJECTIVES

Primary

- To determine the safety and tolerability of RGX-121 in severe MPS II subjects who have or are at high risk of developing neurocognitive deficits

Secondary

- Effect of RGX-121 on biomarkers of IDS activity in CSF, serum and urine
- Effect of RGX-121 on neurocognitive deficits

Subjects: Approximately 16 patients

Sites: Leading U.S. and international lysosomal storage disease centers

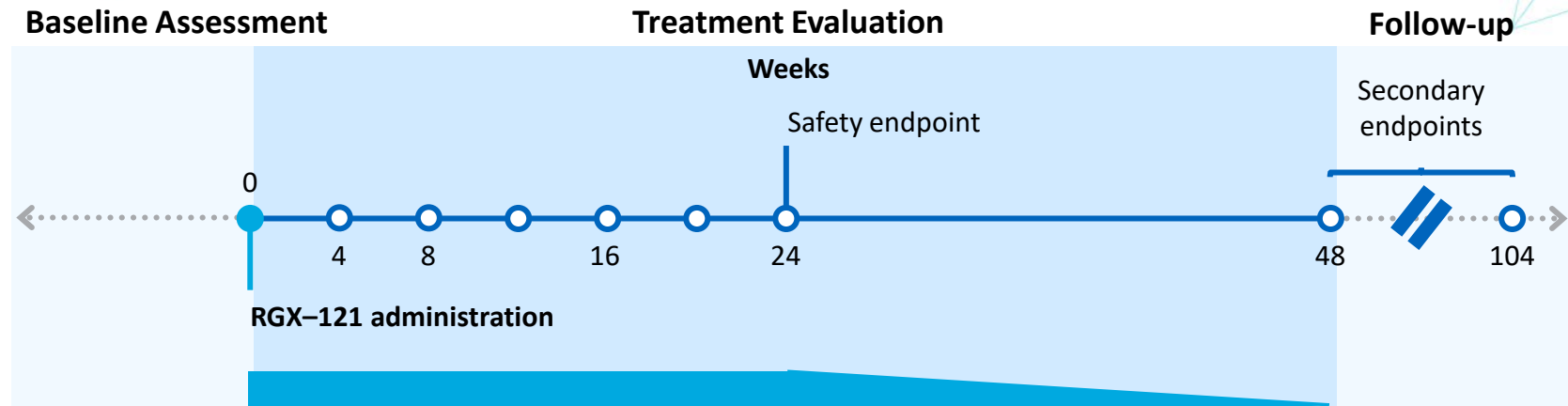


KEY INCLUSION CRITERIA

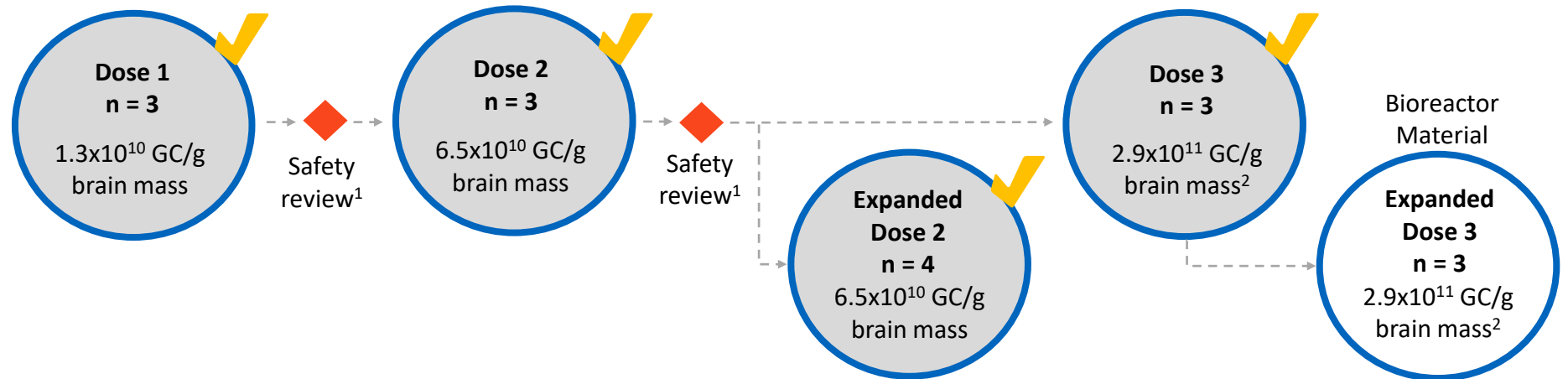
- Male subjects ≥ 4 months to < 5 years of age
- Meeting one of the following criteria:
 - Diagnosis of MPS II and a score ≤ 77 on neurocognitive testing
 - Diagnosis of MPS II and a decline of ≥ 1 standard deviation on consecutive intelligent quotient testing
 - Having a relative diagnosed with severe MPS II who has the same IDS mutation as the subject
 - Having documented mutation(s) in *IDS* that is known to result in a neuronopathic phenotype
- No contraindications for intracisternal or intracerebroventricular injection and immunosuppressive therapy

RGX-121 Phase I/II Clinical Trial: Administration and Dose Escalation

Administration and follow-up timeline



Dose escalation



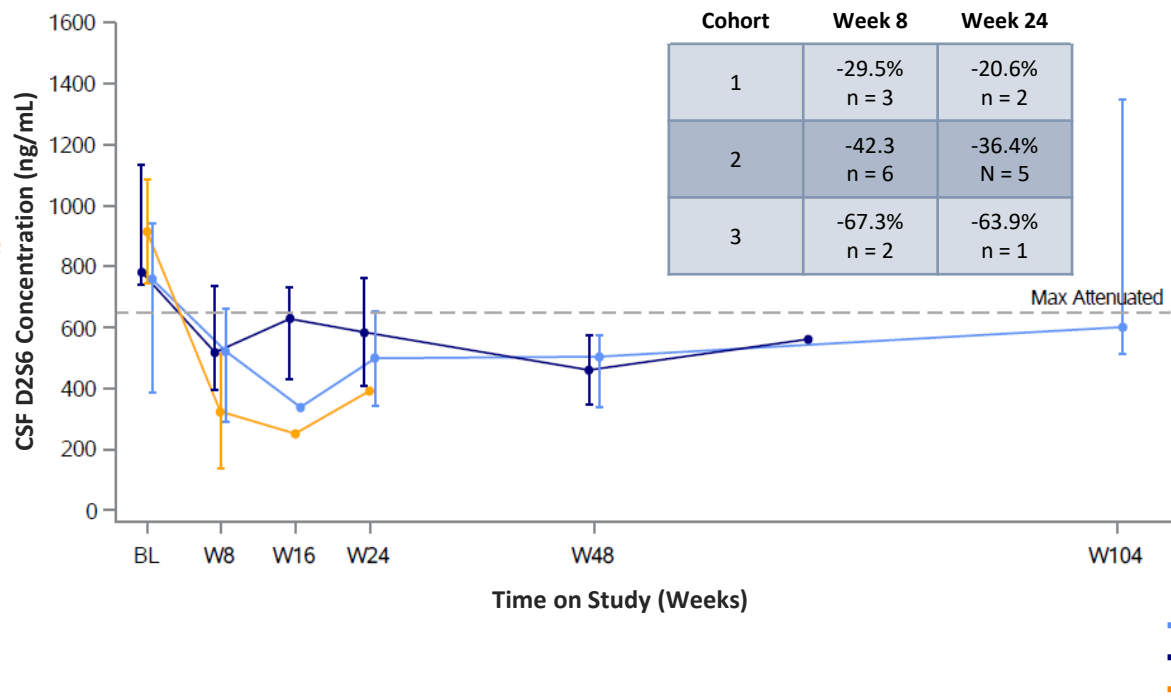
Primary Dose 3 cohort completed in October 2021
Dose 3 expansion cohort using bioreactor material (commercial process)

RGX-121 Phase I/II Clinical Trial: Safety Update and Cohorts 1, 2, and 3 Data Summary

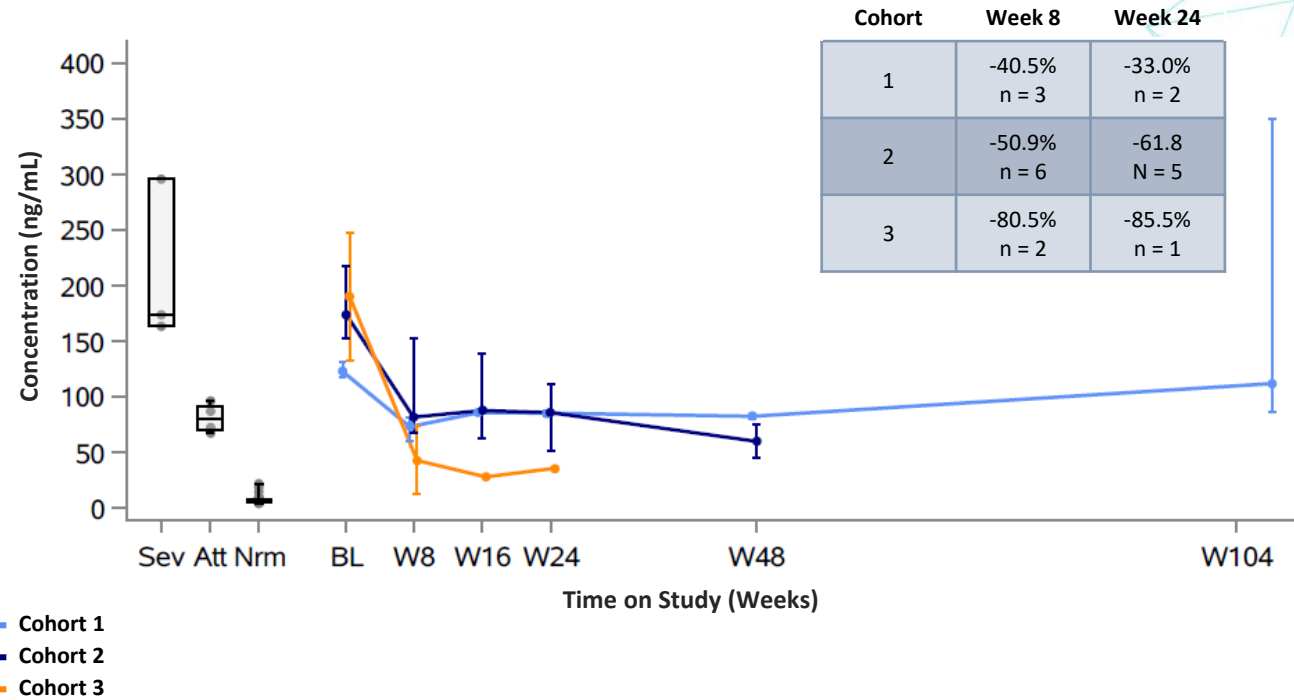
- **Well-tolerated following one-time RGX-121 administration**
 - 13 patients dosed in 3 Cohorts with no SAEs related to study drug
- **CNS biomarker and neurodevelopmental assessments indicate encouraging RGX-121 profile**
 - Dose-dependent reductions in CSF biomarkers demonstrated across 3 Cohorts
 - Cohort 3 CSF D2S6, a component of HS closely correlated with severe MPS II, approached normal levels
 - Improvements in neurodevelopmental function and caregiver reported outcomes in Cohorts 1 and 2 demonstrated CNS activity up to 2 years after RGX-121 administration
- **Systemic evidence of enzyme expression and biomarker activity after CNS RGX-121 administration**
 - Majority of participants demonstrated increases in plasma I2S concentration
 - Urine GAG measures showed evidence of systemic effect of RGX-121 independent of ERT treatment

RGX-121 Phase I/II Clinical Trial: CSF HS and D2S6 measurements showed dose-dependent reductions in Cohorts 1-3 with Cohort 3 participants approaching normal levels in D2S6

Heparan sulfate (HS) in cerebral spinal fluid, Median*



HS D2S6 disaccharide in cerebral spinal fluid, Median*



Data cut: December 20, 2021

* CNS related clinical event (ventriculoperitoneal shunt infection) took place on Day 522 post RGX-121 administration in this Cohort 1 patient that was deemed unrelated to study drug

† Median CSF HS concentration +/- Q1 and Q3 per cohort.

Normative data are based on 29 normal samples. The ages for 9 normative samples range from 1 month to 21 years old.

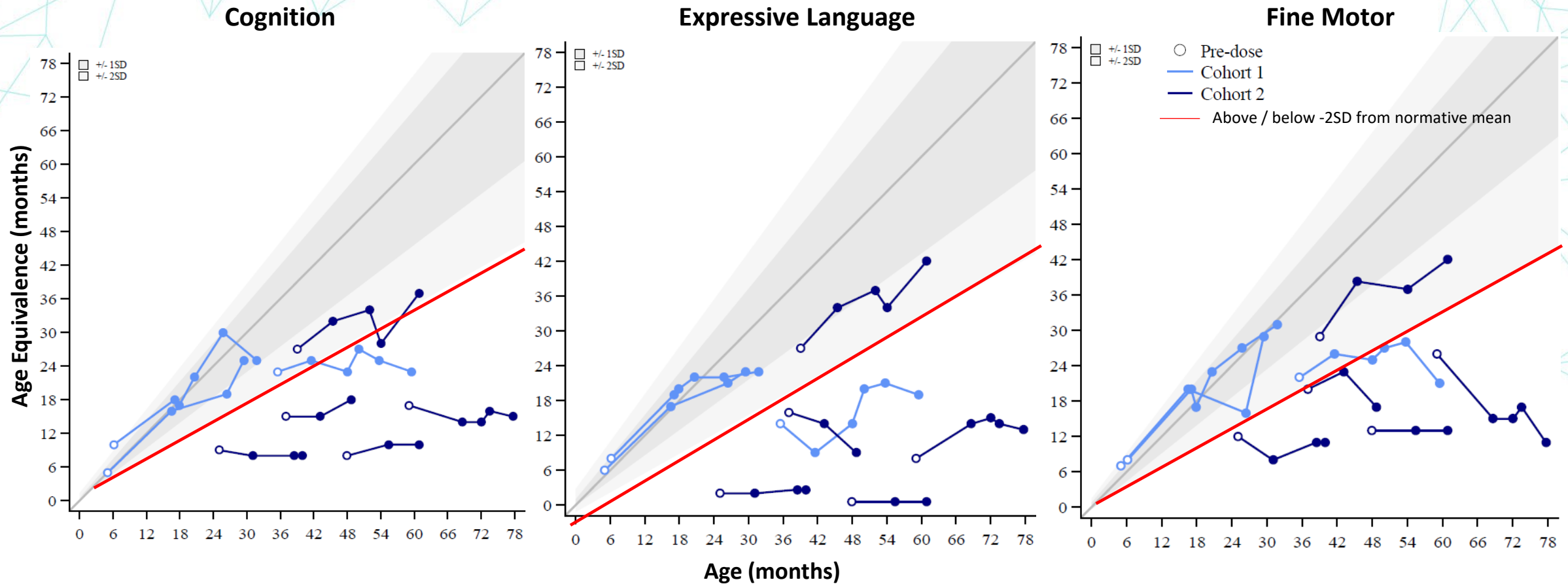
Severe defined as IQ < 70. The ages of 3 severe samples range from 4 years 8 months to 10 years old.

Attenuated defined as IQ ≥ 70. The ages of 4 attenuated samples range from 11 years to 29 years old.



RGX-121 Phase I/II clinical trial: Neurodevelopmental Function

Bayley Scales of Infant and Toddler Development, 3rd Edition (BSID-III)



- 3 participants with cognitive function above -2 SD at baseline remained within 2 SD at the last assessment on the cognition, expressive language and fine motor subtests
- Minimal skill acquisition was demonstrated in participants with cognitive function below -2 SD at baseline

RGX-111 Phase I/II clinical trial in MPS I



OBJECTIVES

Primary

- To determine the safety and tolerability of RGX-111 in MPS I subjects with neurocognitive deficits

Secondary

- Effect of RGX-111 on biomarkers of IDUA activity in CSF, serum and urine
- Effect of RGX-111 on neurocognitive deficits

SUBJECTS: Up to 11 total

SITES: Leading U.S. and lysosomal storage disease centers

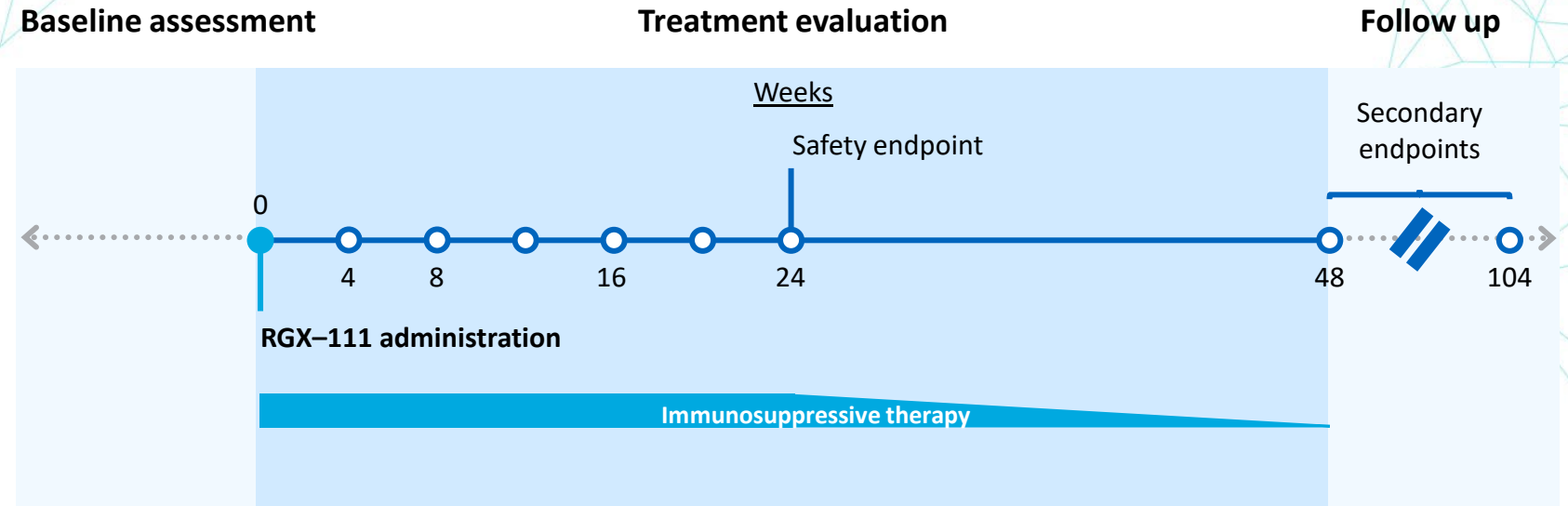


KEY INCLUSION CRITERIA

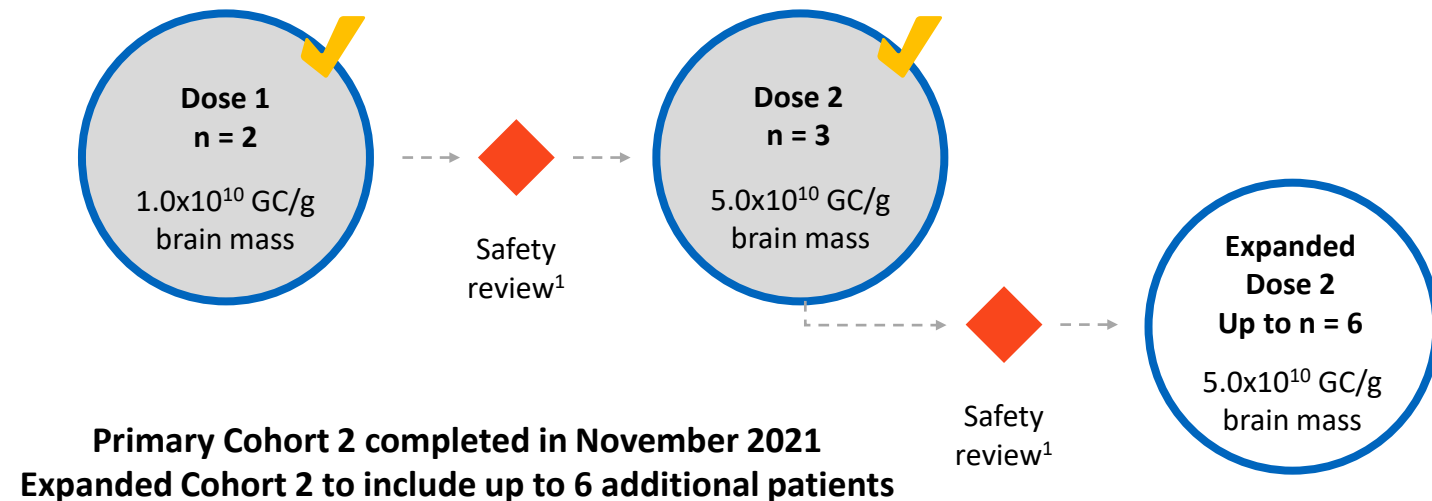
- Male or female ≥ 4 months of age
- Documented evidence of CNS involvement due to MPS I or documented diagnosis of MPS I
 - A score of ≥ 1 standard deviation below mean on intelligent quotient testing or in one domain of neuropsychological function
 - A decline of ≥ 1 standard deviation on sequential testing
 - Having documented biallelic mutation in *IDUA* predictive of severe MPS I or a relative diagnosed with severe MPS I
- No contraindications for intracisternal or intracerebroventricular injection or immunosuppressive therapy

RGX-111 Phase I/II Clinical Trial: Administration and Dose Escalation

Administration and follow-up timeline



Dose escalation

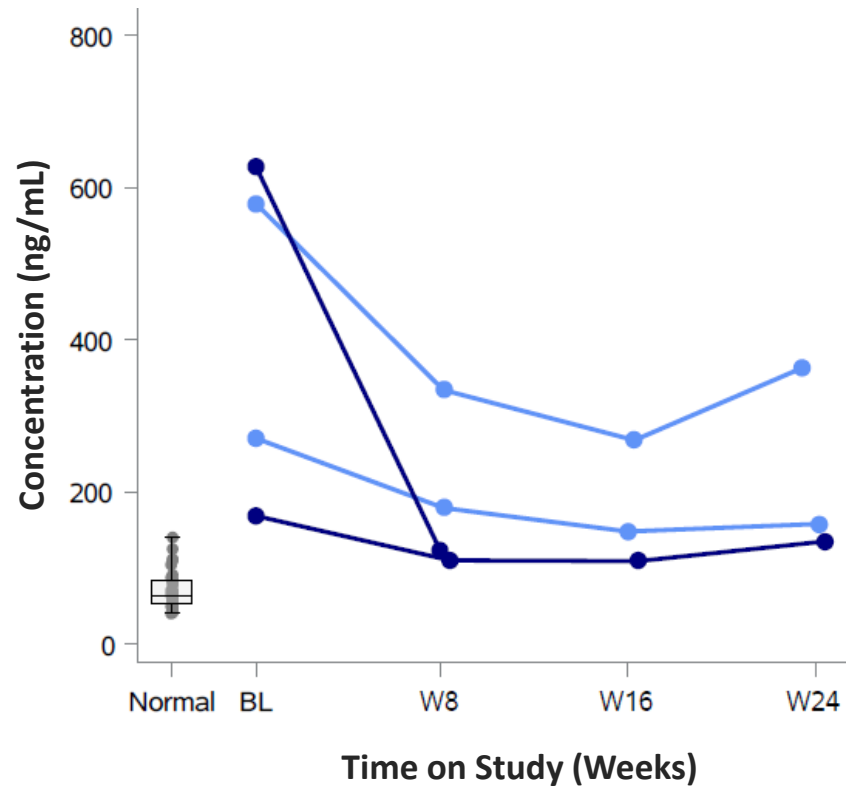


RGX-111 Phase I/II Clinical Trial and Single Patient IND Summary

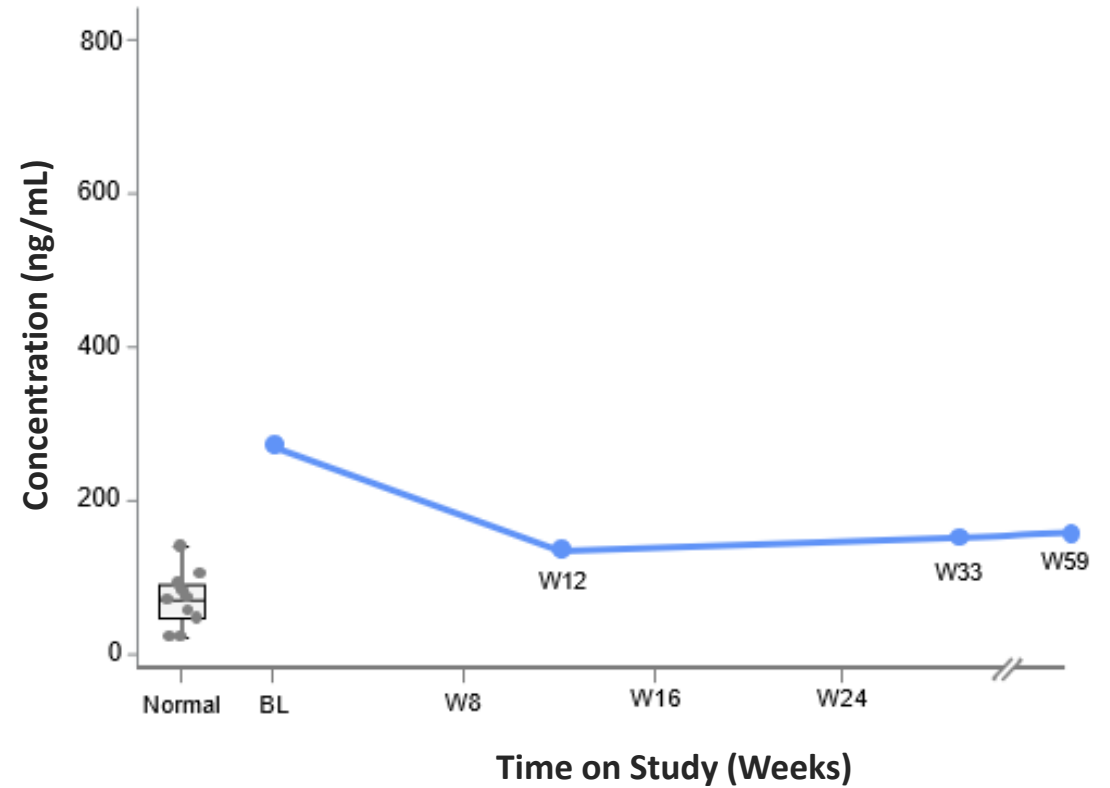
- **Well tolerated following one-time RGX-111 administration**
 - A total of 6 participants dosed with RGX-111 with no SAEs related to study drug
- **CNS biomarker and neurodevelopmental assessments indicate encouraging RGX-111 CNS profile**
 - CSF HS reduction and IDUA enzyme activity indicate CNS biological activity
 - Participants showed continued skill acquisition within 2 SD of normative mean on the cognition, expressive language and fine motor subtests at last assessment
 - Single patient IND participant at 42 months of age demonstrated higher age equivalent scores than available natural history data 20 months after RGX-111 administration
- **Emerging evidence of systemic biomarker activity after CNS administration of RGX-111**
 - Plasma IOS6 reductions observed following RGX-111 administration
 - Low levels of urinary GAGs maintained in all participants

RGX-111 Phase I/II Clinical Trial and Single Patient IND: Biomarker Assessments Indicate Encouraging RGX-111 CNS Profile

Heparan sulfate (HS) in cerebral spinal fluid
Phase 1/2 Trial



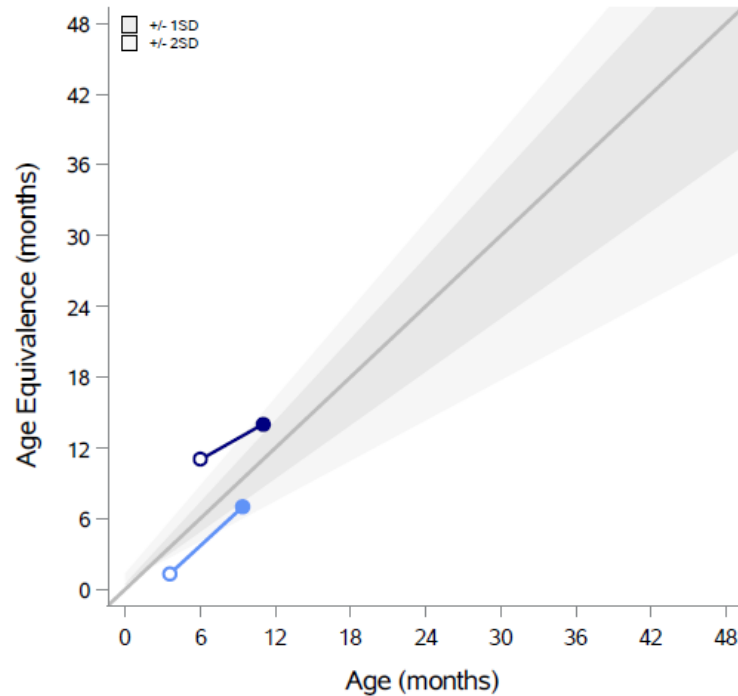
Heparan sulfate (HS) in cerebral spinal fluid
Single Patient IND



Decreased CSF heparan sulfate in all participants through last time point available

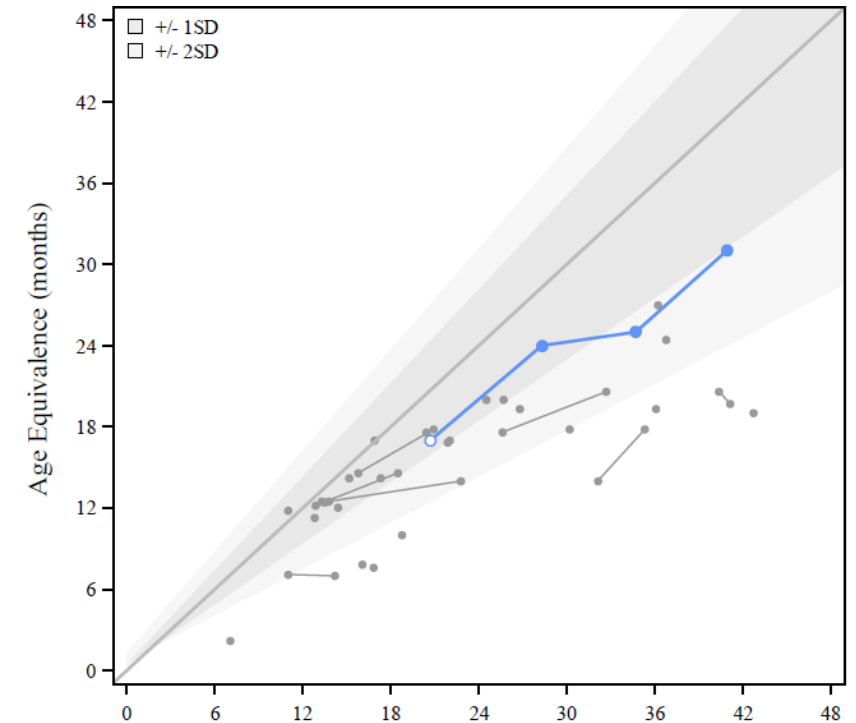
RGX-111 Phase I/II Clinical Trial and Single Patient IND: Neurodevelopmental Assessments Indicate Encouraging RGX-111 CNS Profile

Phase I/II trial neurodevelopment



All participants showed continued skill acquisition within 2 SD of normative mean on the cognition subtest at last assessment

Single patient IND neurodevelopment



Single patient IND participant at 42 months of age demonstrated higher age equivalent scores than available natural history data 20 months after RGX-111 administration*

NAV Technology Platform



The NAV Technology Platform is based on a *broad and deep IP portfolio*

Exclusive rights to more than **100 patents** and **patent applications worldwide**

- AAV7, AAV8, AAV9, AAVrh10
- Over 100 other novel AAV sequences
- Sequences that are at least 95% identical to these capsids

Key features of REGENXBIO's NAV Technology Platform

- Broad and novel tissue selectivity
- Improved manufacturability
- Higher gene transfer
- Longer-term gene expression







 The NEW ENGLAND
JOURNAL of MEDICINE

Long-Term Safety and Efficacy of Factor IX Gene Therapy in Hemophilia B

 The NEW ENGLAND
JOURNAL of MEDICINE

Single-Dose Gene-Replacement Therapy for Spinal Muscular Atrophy

REGENXBIO's **NAV Technology Platform** has been widely adopted
Multiple clinical stage programs being developed by NAV Technology Licensees across a broad range of therapeutic areas

REGENXBIO | Industry leader in AAV production and manufacturing

Deep in-house knowledge of vector characterization and strength in technical operations

3,000 ft² in-house GLP pilot plant with 3 X 200L bioreactor capacity
18,000 ft² of fully-operational advanced manufacturing and analytics lab space
30+ batches of cGMP bulk drug substance product covering multiple programs



**Flexible, large-scale
cGMP capacity**



**Candidate selection to clinical
material in 12 months**



**Robust suspension cell
culture-based production**



**Integrated process optimization to
enable scale and quality**



**Analytical capabilities to ensure
quality for patients**



Key highlights of REGENXBIO's new headquarters

- Corporate, research and manufacturing headquarters opened in May 2021
- **REGENXBIO Manufacturing Innovation Center fully operational**, enabling production at bioreactor scales up to 2,000L using NAVXpress™ suspension platform process
- Integrated approach will allow for more efficient development and manufacturing of product candidates





Team and Conclusion

The REGENXBIO team

Name	Position	Prior Affiliations	
Ken Mills	President, CEO & Co-Founder; Director		
Olivier Danos, Ph.D.	EVP and Chief Scientific Officer		
Vit Vasista	EVP and Chief Financial Officer		
Steve Pakola, M.D.	EVP and Chief Medical Officer		
Curran Simpson	EVP, Chief Operations and Technology Officer		
Ram Palanki, Pharm.D.	EVP, Commercial Strategy and Operations		 <i>A Member of the Roche Group</i>
Patrick Christmas, J.D.	EVP, Chief Legal Officer		
Laura Coruzzi, Ph.D., J.D.	EVP, Intellectual Property		
Shiva Fritsch	EVP, Chief People Officer		

Financial results and guidance

2022 YTD financials as of 3/31/22

Revenue:	\$22.2
R&D expense:	\$55.6
G&A expense:	\$22.3
Net loss:	\$76.7
Basic share count:	42.9

2022 YTD financial highlights as of 3/31/22

Ended Q2 2022 with **\$764.8 million** in cash, cash equivalents and marketable securities

Financial guidance:

Based on its current operating plan, REGENXBIO expects its balance in cash, cash equivalents and marketable securities of \$764.8 million as of March 31, 2022, to fund its operations into 2025.

Program guidance and anticipated milestones

RGX-314	Subretinal wet AMD: 2 pivotal trials ongoing: ATMOSPHERE™ and ASCENT™ currently enrolling patients Suprachoroidal wet AMD: Cohort 5 enrollment complete Suprachoroidal DR: Enrollment complete
RGX-202	IND cleared; AFFINITY DUCHENNE™ expected to initiate in 1H 2023
RGX-121	Phase I/II trial in patients up to 5 years old: Cohort 3 expansion cohort plans continue using commercial-scale cGMP material Phase I/II trial in pediatric patients over 5 years old: ongoing
RGX-111	Phase I/II trial: Cohort 2 expansion arm enrollment plans continue



Thank You