May 2021

CORPORATE OVERVIEW

Innovative Approaches to Regulating Immune Response

Nasdaq: ALDX

Disclaimers and Forward-Looking Statements

This presentation and various remarks which may be made during this presentation contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 and Section 21E of the Securities Exchange Act of 1934, as amended, including statements regarding Aldeyra's possible or assumed future results of operations, expenses and financing needs, business strategies and plans, research and development plans or expectations, political, economic, legal, social and health risks, including the recent COVID-19 outbreak and subsequent public health measures and other responses to it, that may affect Aldeyra's business or the global economy, the structure, timing and success of Aldeyra's planned or pending clinical trials, expected milestones, market sizing, pricing and reimbursement, competitive position, regulatory matters, industry environment and potential growth opportunities, among other things. The results of earlier preclinical or clinical trials may not be predictive of future results. As a result of the COVID-19 pandemic, clinical site availability, staffing, and patient recruitment have been negatively affected and the timelines to complete Aldeyra's clinical trials may be delayed. Forward-looking statements include all statements that are not historical facts and, in some cases, can be identified by terms such as "may," "might," "will," "objective," "intend," "should," "could," "can," "would," "expect," "believe," "anticipate," "project," "target," "design," "estimate," "predict," "potential," "plan" or similar expressions and the negatives of those terms.

Forward-looking statements involve known and unknown risks, uncertainties and other factors that may cause Aldeyra's actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. These statements reflect Aldeyra's current views with respect to future events and are based on assumptions and subject to risks and uncertainties, including the development, clinical and regulatory plans or expectations for Aldeyra's product candidates and systems-based approaches, later developments with the FDA that may be inconsistent with Aldeyra's expectations and beliefs, including the risk that the results from earlier clinical trials or portions of clinical trials may not accurately predict results of subsequent trials or the remainder of a clinical trial for the same or different indications, inconsistent expectations regarding FDA acceptance and review of the company's filings and submitted data sets, and Aldeyra's continuing review and quality control analysis of clinical data. Important factors that could cause actual results to differ materially from those reflected in Aldeyra's forward-looking statements are described in Aldeyra's most recent Annual Report on Form 10-K and Quarterly Report on Form 10-Q, as well as Aldeyra's subsequent filings with the Securities and Exchange Commission. All of Aldeyra's development plans and timelines may be subject to adjustment depending on funding, recruitment rate, regulatory review, preclinical and clinical results, and other factors any of which could result in changes to Aldeyra's development plans and programs or delay the initiation, completion, or reporting of clinical trials.

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Compelling Value Proposition

NOVEL SYSTEMS-BASED APPROACHES FOR IMMUNOLOGY

- RASP-inhibition represents a first-in-class therapeutic approach.
- Three unique immune-modulating mechanisms of action in development.

NEAR-TERM DEVELOPMENT CATALYSTS*

- Phase 3 TRANQUILITY and TRANQUILITY-2 results in dry eye disease expected 2H 2021.
- ADX-629 Phase 2 clinical testing results in asthma, psoriasis, and COVID-19 expected 2H 2021.

LARGE AND UNDERSERVED MARKET OPPORTUNITY

- Lead product candidate reproxalap targets a U.S. addressable market of >$20B.
- Significant potential commercial advantages of reproxalap in two blockbuster ocular indications.

SOLID CASH POSITION

- Cash, cash equivalents and marketable securities of $138.4M as of 3/31/2021
- Cash runway through the end of 2023, based on projected operating expenses**

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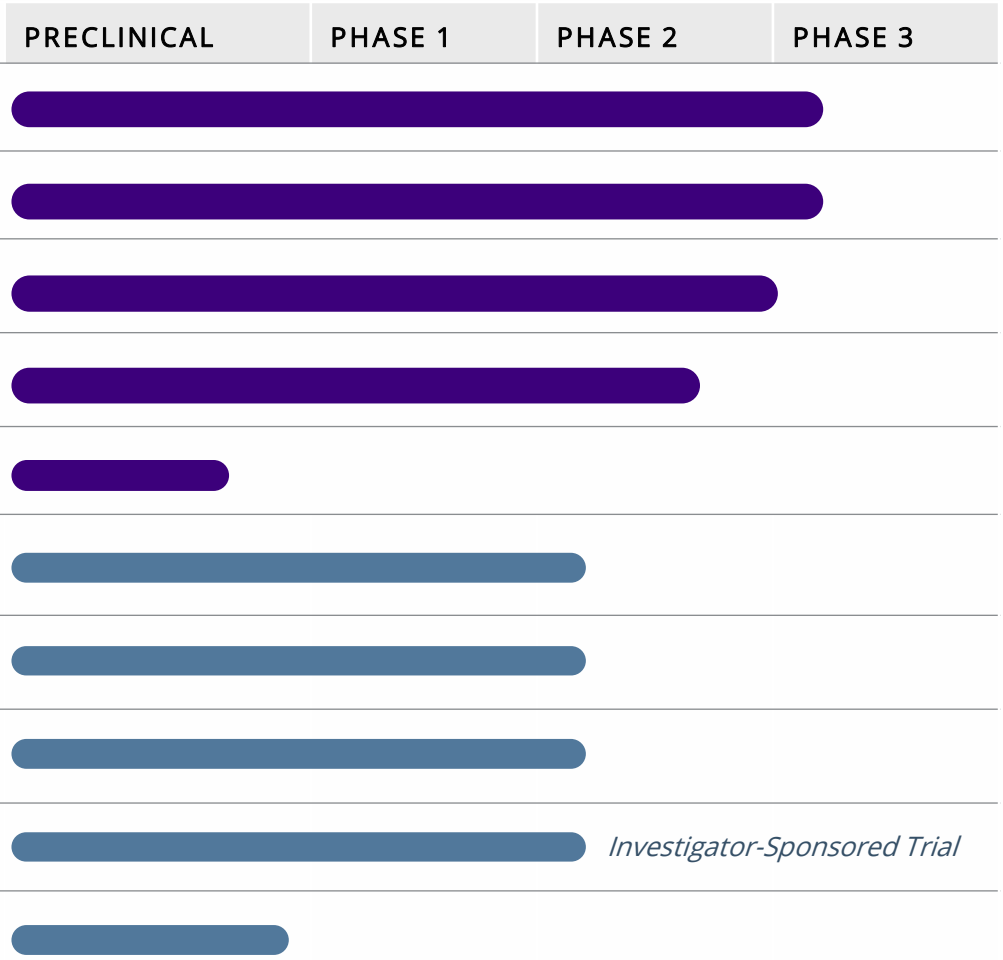
*Timing depends, in part, on restrictions related to COVID-19, the availability of clinical research facilities and staffing, the ability to recruit patients, and regulatory feedback.
**Raised $125 million, before deduction of underwriting discounts and commissions and other offering expenses, in gross proceeds in May 2021 underwritten public offering. Runway based on the company's Q1 2021 financial results press release dated May 6, 2021.

Deep and Innovative Pipeline Addressing Immunological Disease

DISEASE AREA	COMPOUND	MECHANISM	INDICATION
Ocular Diseases	Reproxalap	RASP	Dry Eye Disease
			Allergic Conjunctivitis
	ADX-2191	DHFR	Proliferative Vitreoretinopathy
			Primary Vitreoretinal Lymphoma
	ADX-103/10X	RASP	Retinal Disease
Systemic Diseases	ADX-629	RASP	Cytokine Release Syndrome (COVID-19)
			Allergy (Atopic Asthma)
			Autoimmune Disease (Psoriasis)
	ADX-1612	CHP	Ovarian Cancer
			SARS-CoV2 Antiviral (COVID-19)



RASP Mechanism = Reactive Aldehyde Species Inhibitor **DHFR Mechanism** = Dihydrofolate Reductase Inhibitor **CHP Mechanism** = Chaperome Inhibitor

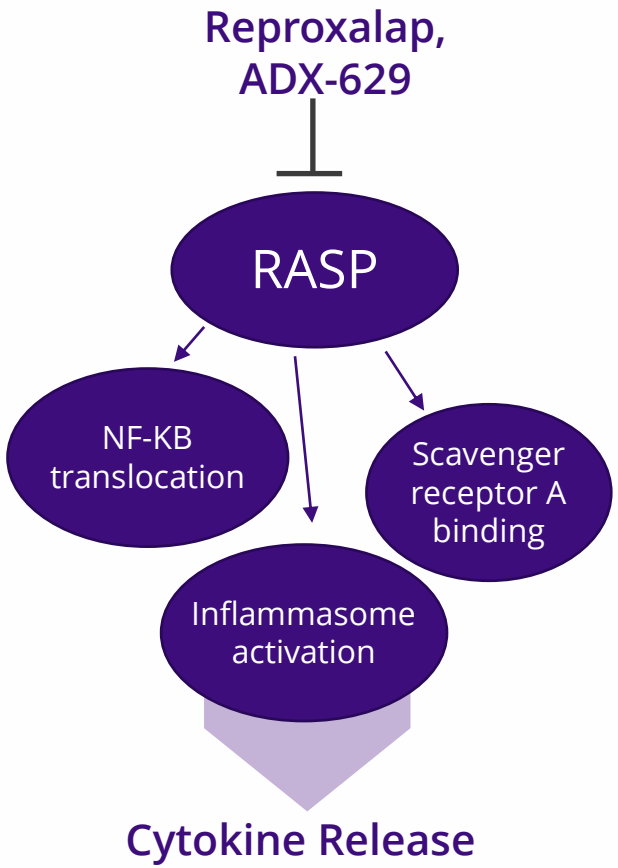
May 2021

REPROXALAP AND ADX-629

Reactive Aldehyde Species (RASP) Inhibition

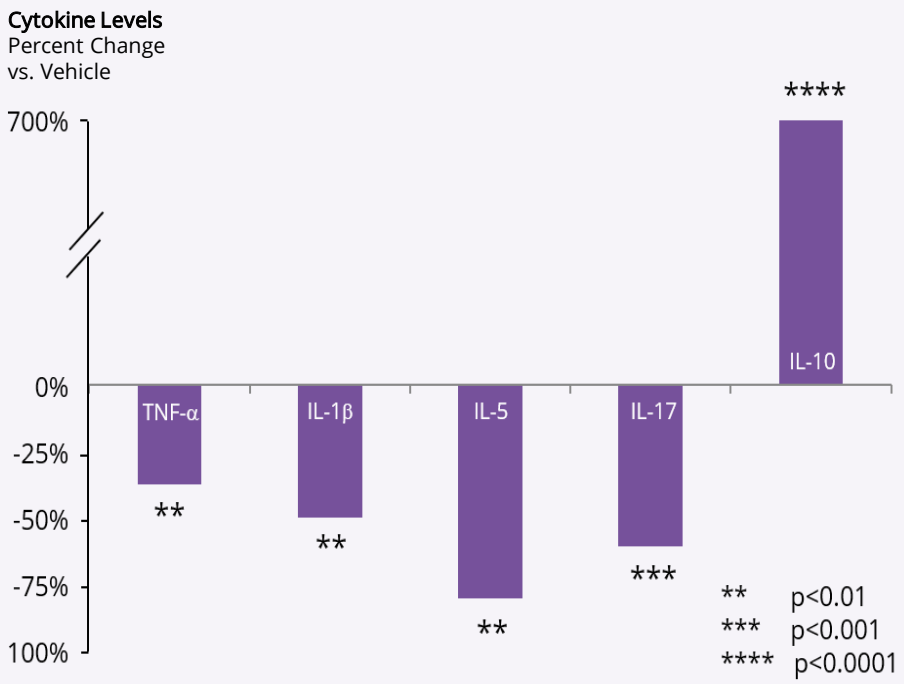
Nasdaq: ALDX

RASP Inhibition is a Pre-Cytokine, Systems-Based Approach that Has Been Clinically Validated in Late-Stage Trials



Preclinical Broad-based Cytokine Reduction

LPS Animal Model of Cytokine Storm



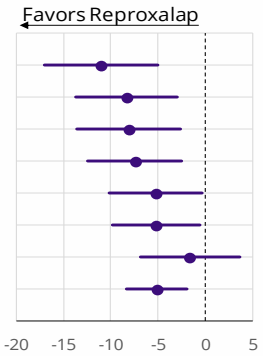
Broad-based Symptom Reduction

RENEW-Part 1 Phase 3 Dry Eye Disease Trial

Symptom Treatment Difference‡ (Reproxalap-Vehicle)
Over Weeks 2 to 12

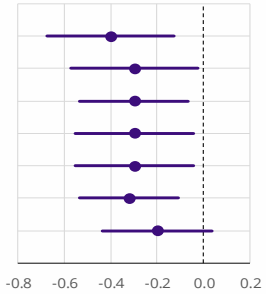
0-100 Ocular Symptom Scales

	p-value
VAS: Ocular Dryness (Co-Primary)	0.0004
VAS: Eye Discomfort	0.0025
VAS: Photophobia	0.0041
VAS: Foreign Body Sensation	0.0035
VAS: Itching	0.0346
VAS: Pain	0.0268
VAS: Burning/Stinging	NS
OSDI (Total)	0.0020



0-4 & 0-5 Ocular Symptom Scales

OD4S: Grittiness	0.0025
OD4S: Dryness	0.0134
OD4S: Ocular Discomfort	0.0268
OD4S: Burning	0.0306
OD4S: Stinging	0.0239
CAC Ocular Itching Scale	0.0034
Ocular Discomfort Scale	NS



‡Treatment Difference of induction-maintenance dosing, defined as the difference between the changes from baseline for the evaluated drug vs. vehicle (LS Mean Difference ± 95% CI). Ocular Dryness Score co-primary endpoint assessed in pre-specified patient population having an OD4S dryness baseline score of ≥ 3 (N=170). **Slide sources:** Cullen et. al., J. of Allergy and Clinical Immunology, Volume 135, Issue 2, AB384, Feb 2015; Reproxalap RENEW-Part 1 clinical trial results. **RASP** = Reactive Aldehyde Species **VAS** = Visual Analog Scale **OSDI** = Ocular Surface Disease Index **NS** = Not Significant **OD4S** = Ocular Discomfort & 4-Symptom **CAC** = Conjunctival Allergen Challenge

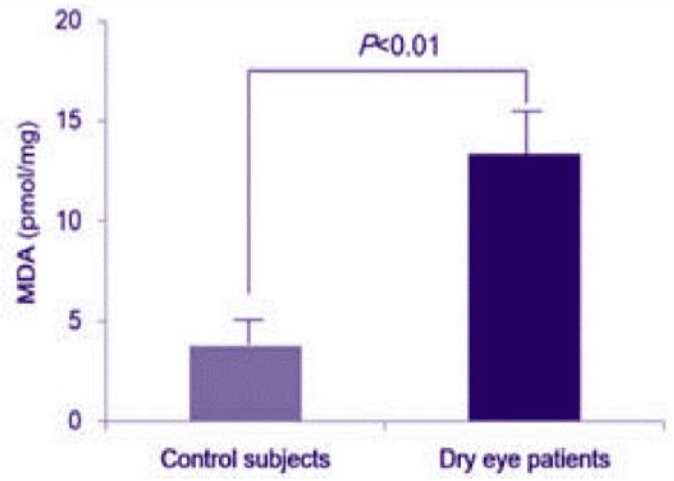
Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

Reproxalap's Mechanism of Action Reduces RASP, a Potential Dry Eye Disease Biomarker

RASP in Dry Eye Disease

RASP markers are upregulated in dry eye disease.

RASP levels have been shown to correlate with worsening symptoms and signs.

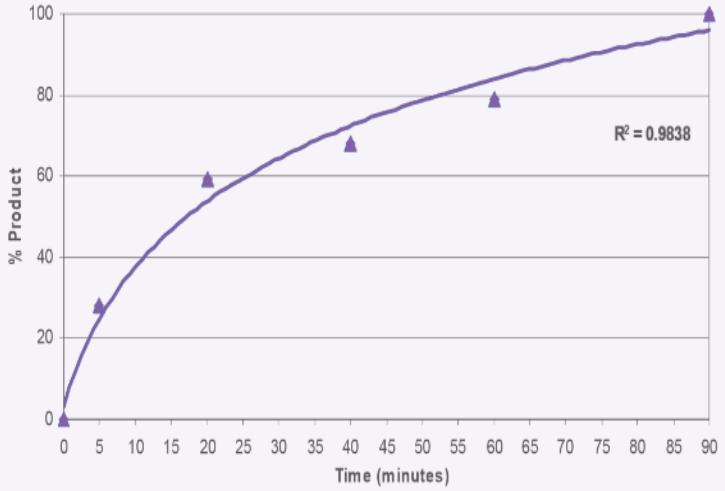


Source: Curr Eye Res. 2016, 41(9):1143-9

REPROXALAP

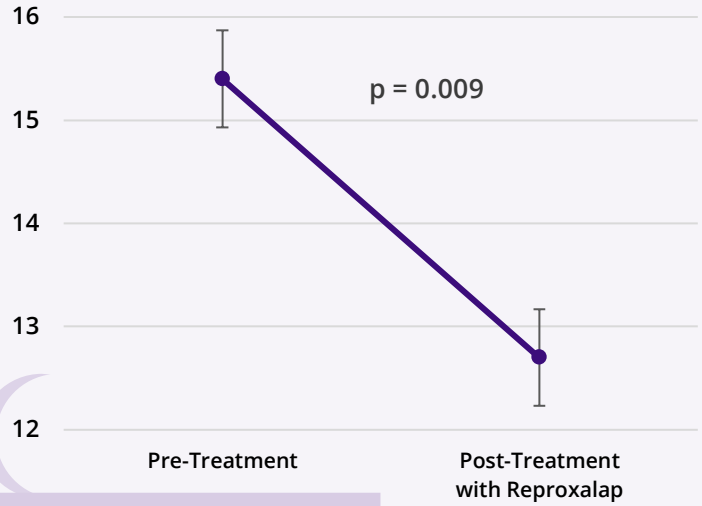
Preclinical rapid and complete RASP binding

In vitro Reproxalap-Malondialdehyde (MDA) adduct formation over time (% of MDA bound by reproxalap)



Clinical reduction in RASP adducts

Phase 2a: Tear RASP Levels in Dry Eye Disease Patients
(µM Malondialdehyde Adduct; Mean ± Within-Subject SEM)



RASP is an FDA-approvable objective sign of dry eye disease.*

*Aldeyra's written meeting minutes with the FDA confirmed the use of redness or RASP as accepted objective signs for the treatment of dry eye disease. **Slide sources:** Choi W., et al. Expression of Lipid Peroxidation Markers in the Tear Film and Ocular Surface of Patients with Non-Sjogren Syndrome: Potential Biomarkers for Dry Eye Disease. Curr Eye Res. 2016, 41(9):1143-9; Reproxalap preclinical and Phase 2a in dry eye disease clinical trial results on file.

Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

Lead RASP Inhibitor Reproxalap, a Novel Topical Ocular Drug, Now in Two Phase 3 Programs for Ocular Inflammation

DRY EYE DISEASE

Often months to demonstrate even modest efficacy with current Rx

34 million or more adults in the U.S.[1]

ALLERGIC CONJUNCTIVITIS

Unchecked growing disease burden and limited options beyond OTC/Rx antihistamines

66 million or more adults in the U.S.[2]

Reproxalap poised to potentially be the next novel entrant in the dry eye disease and allergic conjunctivitis markets.

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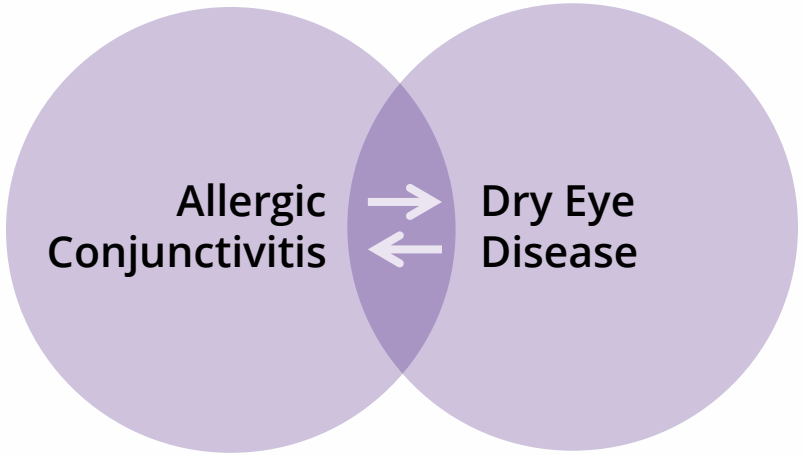
[1]Paulsen AJ, Cruickshanks KJ, Fischer ME, et al. Dry eye in the beaver dam offspring study: prevalence, risk factors, and health-related quality of life. Am J Ophthalmol. 2014;157(4):799-806. doi:10.1016/j.ajo.2013.12.023.
[2]Singh K, Axelrod S, Bielory L. The epidemiology of ocular and nasal allergy in the United States, 1988-1994. J Allergy ClinImmunol. 2010;126(4):778-783.e6

Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

Allergic Conjunctivitis and Dry Eye Disease Are Interrelated Inflammatory Ocular Surface Diseases

The Three **P's** of Ocular Surface Inflammation

- Allergic response can compromise tear film.
- Dry eye oxidative stress can enhance allergic response.
- Dry, polluted environments exacerbate both conditions.



"The clear interaction of allergy, dry eye and environmental irritants makes untangling their etiology in prevalence studies difficult."

Slide sources: Concepts adapted from "The Whipsaw of Allergic Dry Eye" by Mark B. Abelson, MD and Lauren Lilyestrom in REVIEW of Ophthalmology; October 2008; and Hom MM, Nguyen AL, Bielory L. Allergic conjunctivitis and dry eye syndrome. Ann Allergy Asthma Immunol. 2012 Mar;108(3):163-6.

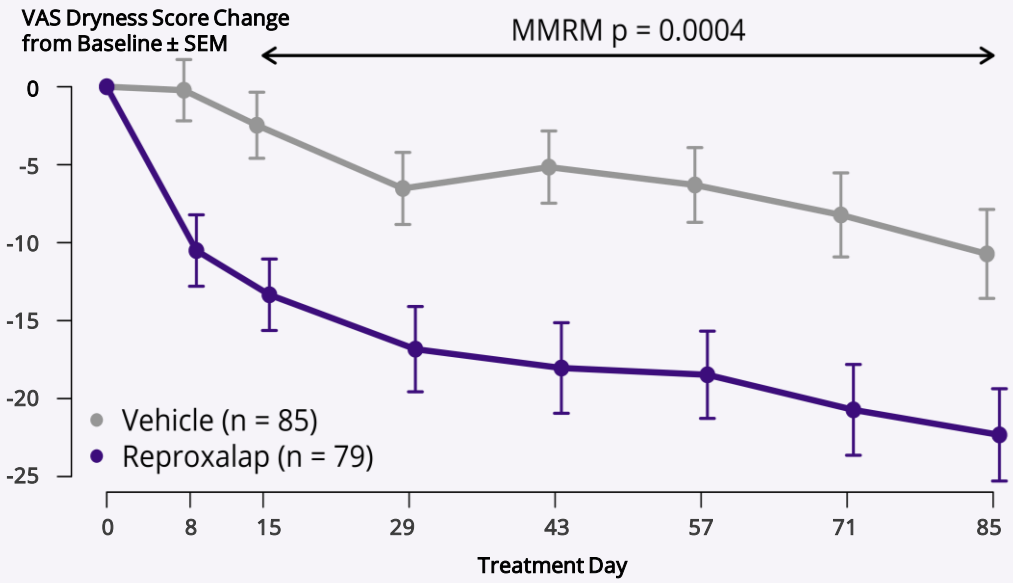
Reproxalap Met 12-Week (Chronic) Dryness Symptom Primary Endpoint in RENEW-Part 1 and Formulation Phase 2 Clinical Trials

Ocular Dryness Score (VAS) Change From Baseline

Dryness (OD4SQ) Baseline Score ≥ 3

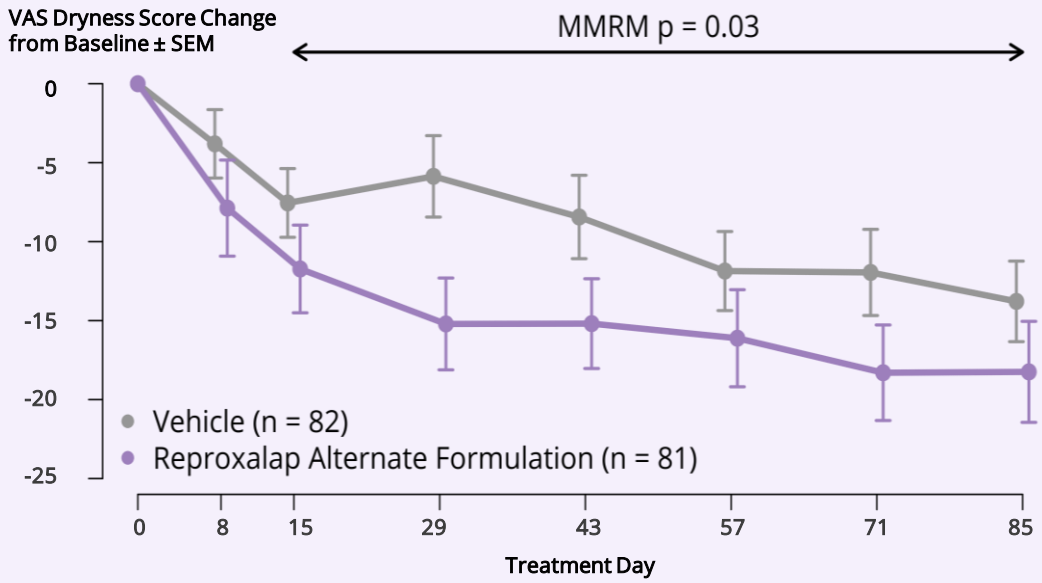
RENEW—Part 1

(Induction-Maintenance Dosing)



FORMULATION PHASE 2

(Induction-Maintenance Dosing)

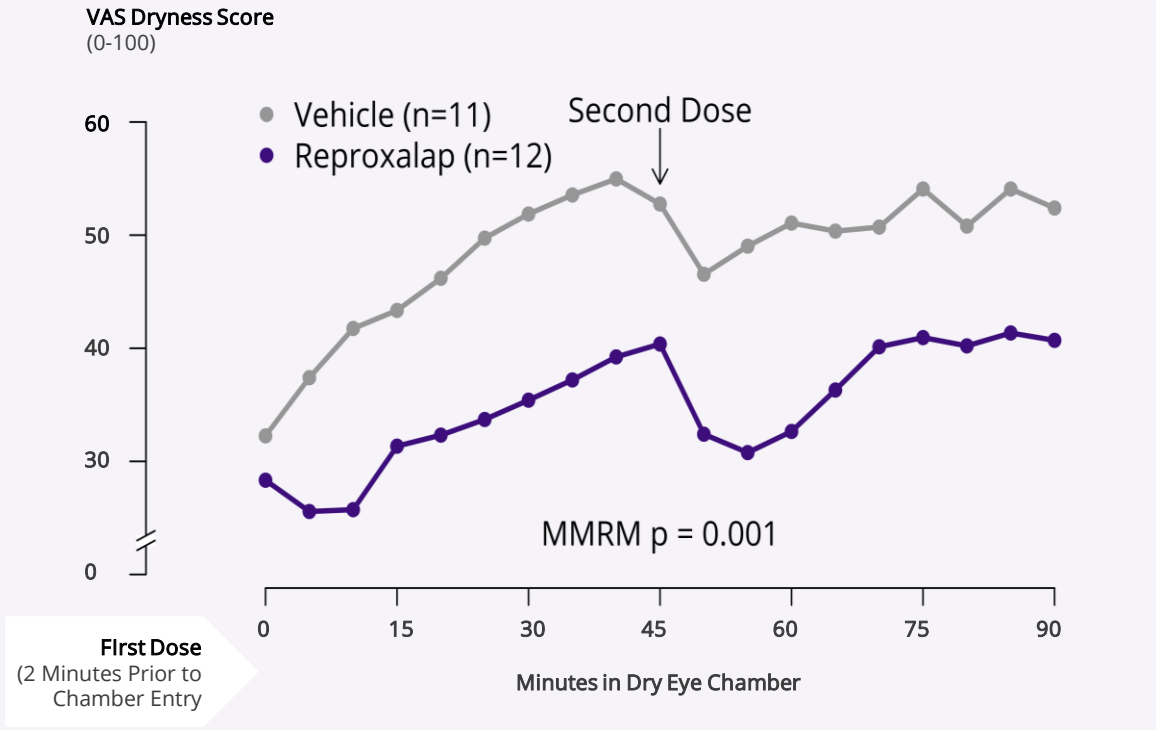


Source: Reproxalap RENEW-Part 1 and Formulation Phase 2 DED clinical trial results. **OD4SQ** = Ocular Dryness 4-Symptom Questionnaire **VAS** = Visual Analog Scale **MMRM** = Mixed Effect Model Repeated Measures

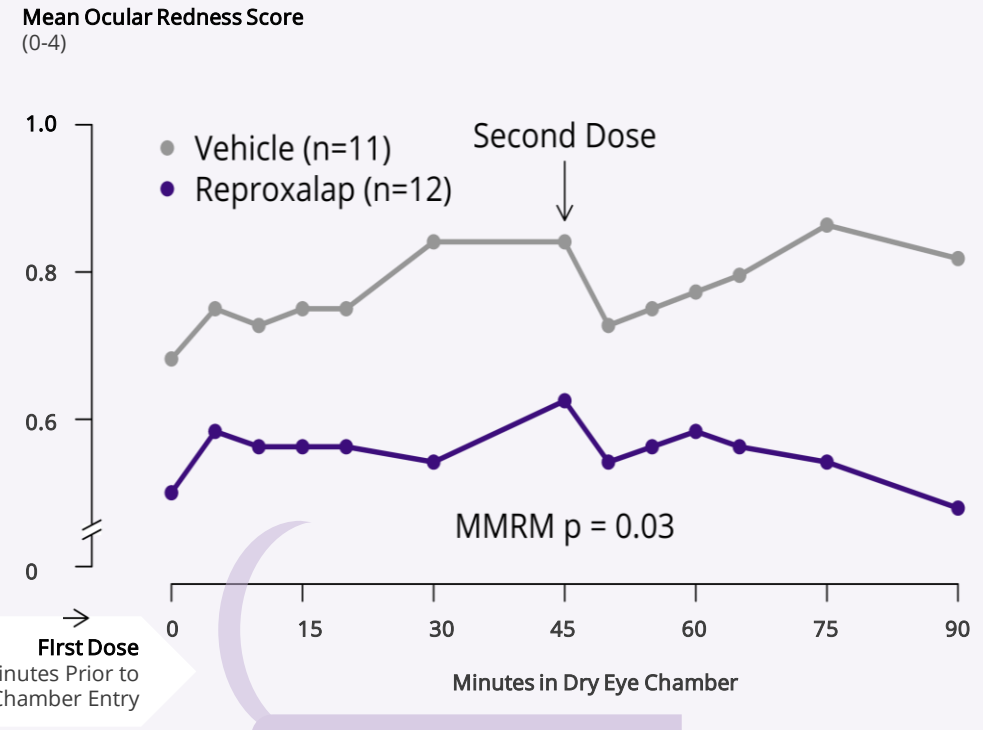
Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

Phase 3 TRANQUILITY Trial Run-In Cohort: Symptom and Sign Activity Demonstrated within Minutes in a Dry Eye Chamber

VISUAL ANALOG DRYNESS SCORE (0-100)



OCULAR REDNESS SCORE (0-4)



Redness is an FDA-approvable objective sign of dry eye disease.*

P values derived from MMRM of change from baseline, where baseline defined as Time 0. **VAS** = Visual Analog Scale **MMRM** = Mixed Effect Model Repeated Measures

Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

Phase 3 TRANQUILITY Dry Eye Disease Trial Design

DRY EYE CHAMBER CHALLENGE MODEL

Design	Multi-center, randomized, double-masked, parallel group, vehicle-controlled
Dosing	Day 1: QID; Day 2 (chamber): BID
Size	~150 patients per arm; 300 patients total
Primary Endpoint	Ocular redness over 90 minutes in a dry eye chamber
Secondary Endpoints	• Tear RASP levels • Schirmer's Test • Dry eye symptoms

Results from the identical TRANQUILITY and TRANQUILITY-2 Trials are expected in H2 2021.

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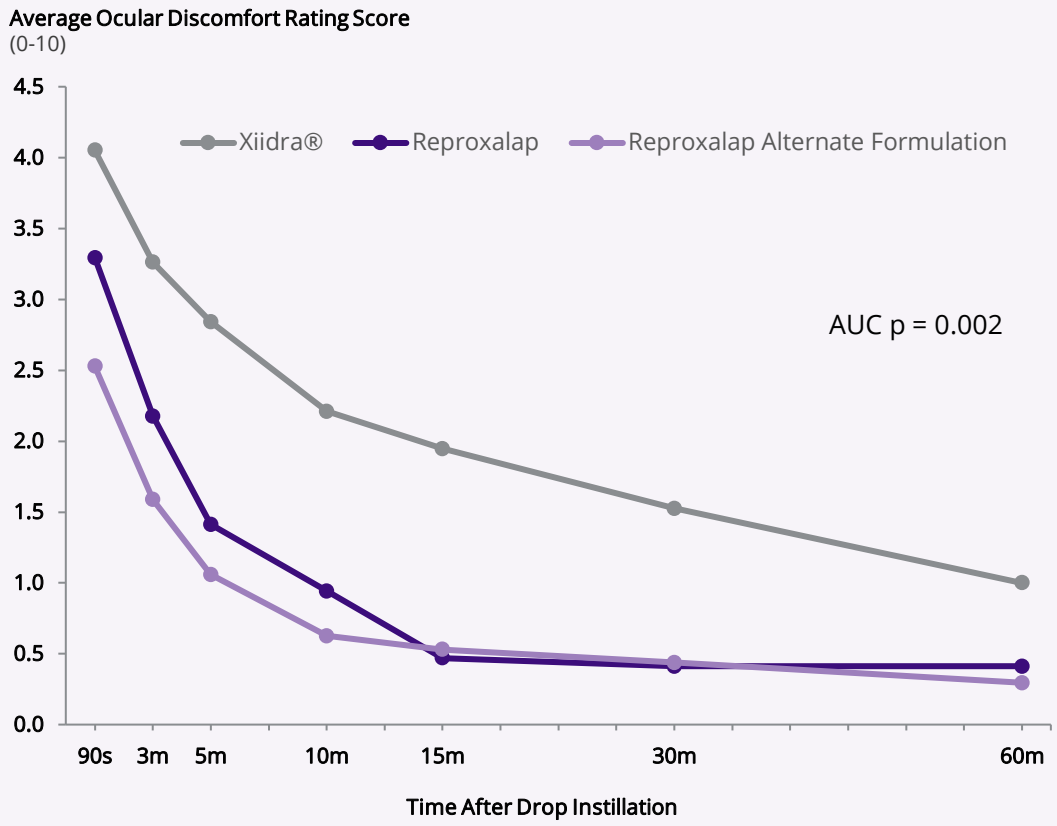
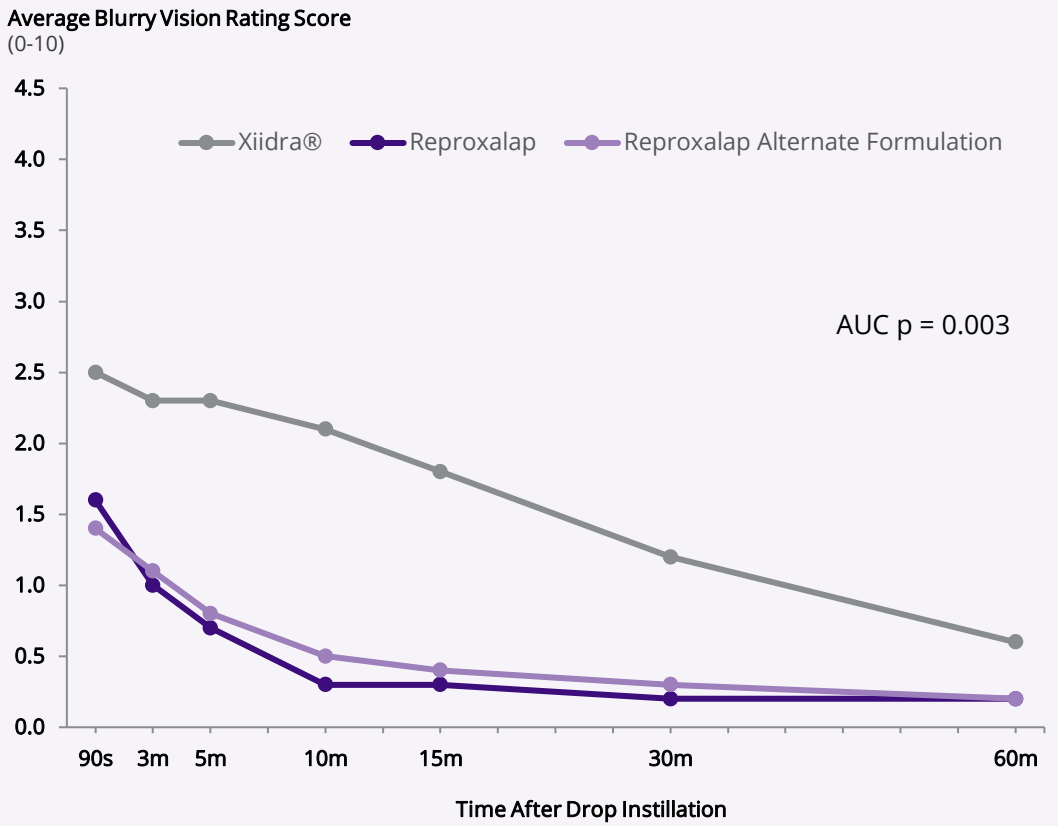
Tolerability of Reproxalap Over One Hour Post-Instillation Significantly Improved vs. Xiidra® in Dry Eye Disease Patients

OCULAR DISCOMFORT RATING



BLURRY VISION RATING



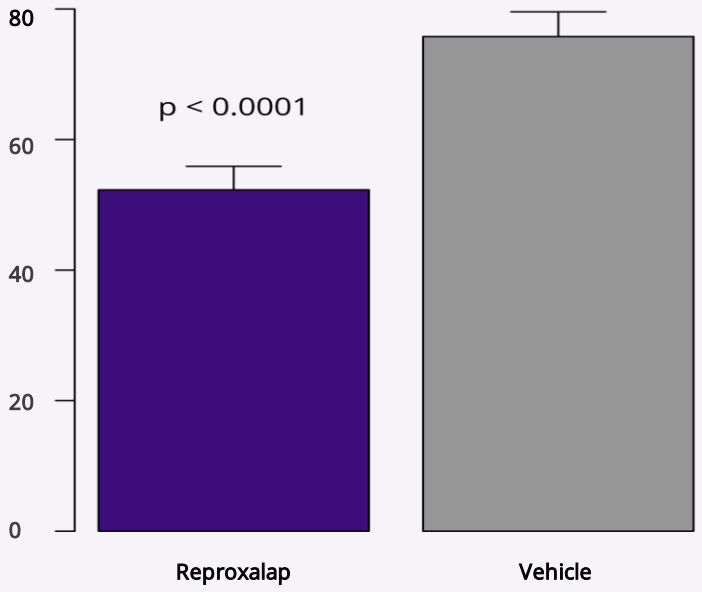
P-values represent MMRM of vehicle AUC vs. pooled Reproxalap AUC.

Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

Reproxalap Achieved Primary and Key Secondary Endpoints in ALLEVIATE Phase 3 Trial in Allergic Conjunctivitis

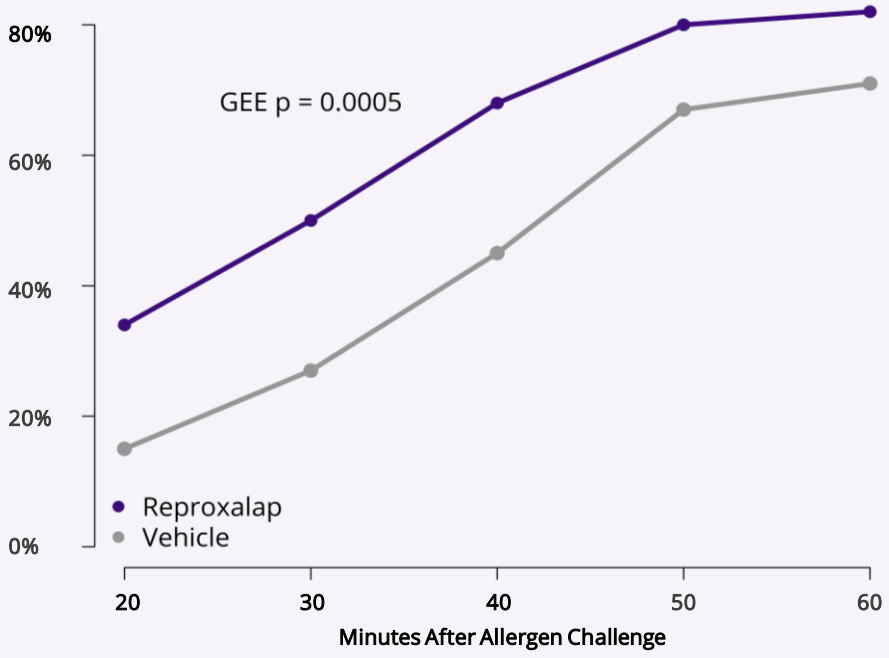
CONJUNCTIVAL ALLERGEN CHALLENGE

Area Under the Ocular Itch Score Curve Mean ± SEM (10-60 minutes after allergen challenge)



ALLEVIATE PHASE 3 TRIAL

Responder Probability
(2-Point Improvement from Peak Baseline Itch Score)



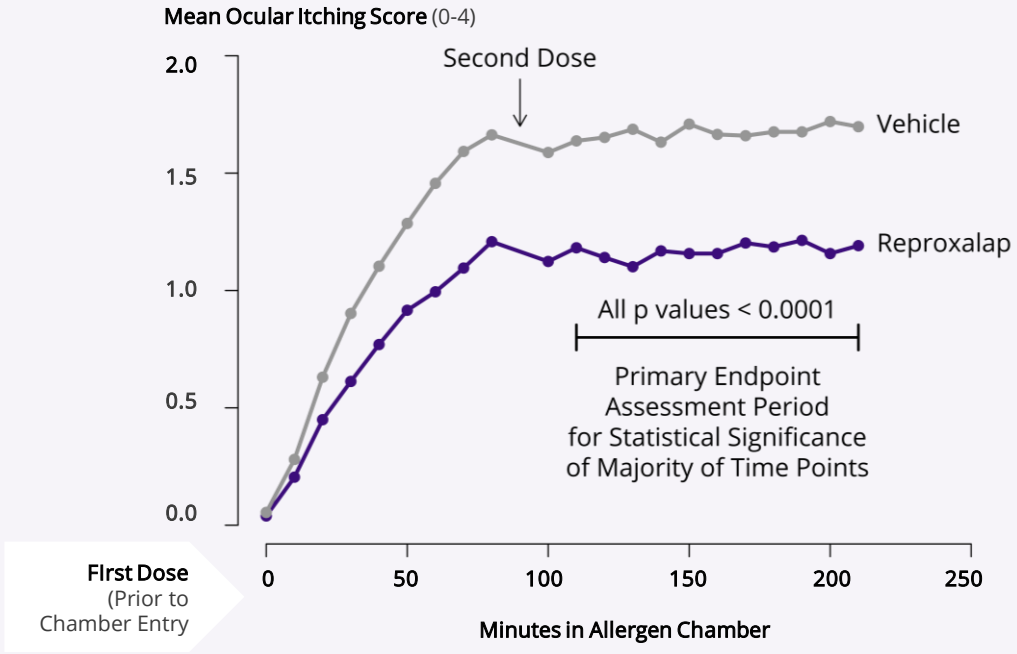
Approximately 100 subjects per arm, parallel-group. Topical ocular reproxalap has been studied in over 1,100 patients with no observed safety concerns reported; mild instillation site irritation is the most commonly reported adverse event in clinical trials. **Source:** Reproxalap ALLEVIATE Phase 3 and allergen chamber Phase 2 clinical trial results; Ocular itch scale (0-4); Ocular redness scale (0-4). **MMRM** = Mixed Effect Model Repeated Measures

Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

Primary and Key Secondary Endpoints Achieved in Phase 3 INVIGORATE Allergen Chamber Trial

PRIMARY ENDPOINT

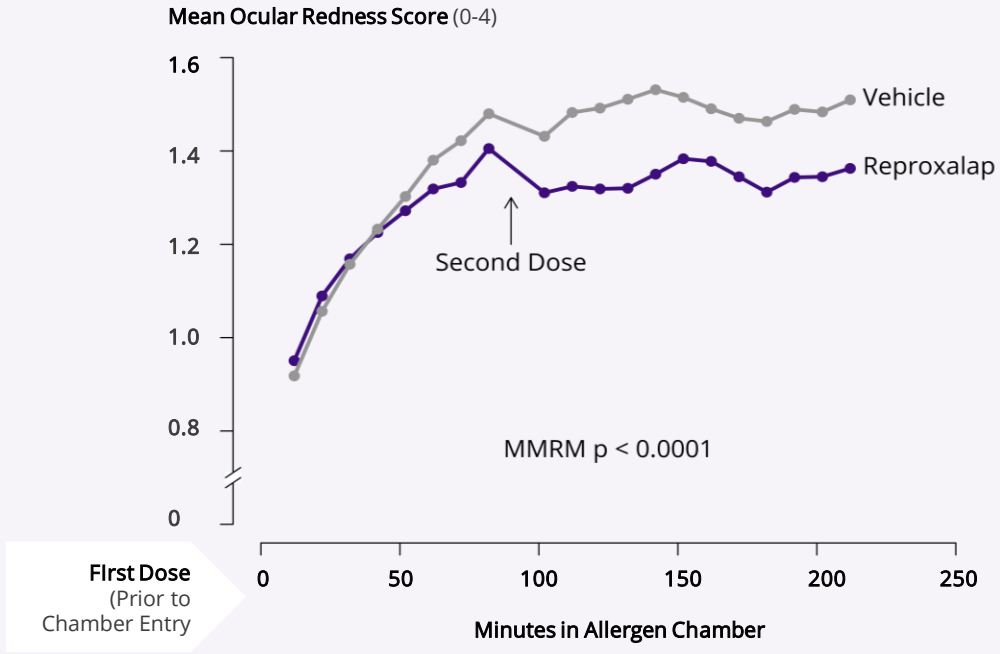
(Reduction in Ocular Itching Over Pre-Specified Time Frame)



Prophylactic and treatment effects of reproxalap demonstrated

KEY SECONDARY ENDPOINT

(Reduction in Ocular Redness Over the Entire Chamber)



Over entire chamber, change from baseline in ocular redness statistically lower in reproxalap-treated subjects

Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

Slide sources: INVIGORATE clinical trial results **MMRM** = Mixed Effect Model Repeated Measures

Topical ocular reproxalap has been studied in over 1,200 patients with no observed safety concerns; mild instillation site discomfort is the most commonly reported adverse event in clinical trials.

ADX-629 Clinical Initiative in Systemic Inflammatory Disease Complements Late-Stage Programs

ADX-629 is a first-in-class, orally available and irreversible covalent inhibitor of pro-inflammatory RASP, and potentially represents a new paradigm in the understanding and treatment of immune-mediated disease.

Comprehensive systemic disease initiative designed to assess the activity of ADX-629 in three types of severe inflammation: cytokine release syndrome, allergic inflammation, and autoimmune disease.

RASP-INHIBITION IN SYSTEMIC DISEASES

Phase 2 Proof of Concept Clinical Trials in Three Types of Severe Inflammation

1 Phase 2 clinical trial in COVID-19

2 Phase 2 allergen-challenge clinical trial in atopic asthma

3 Phase 2 clinical trial in psoriasis

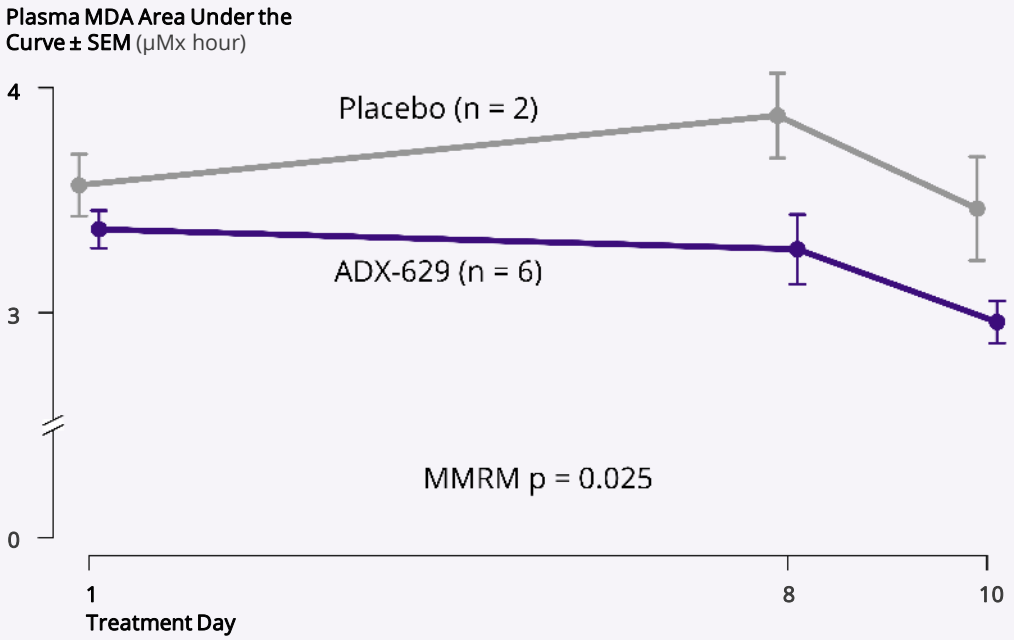
Data Readouts Expected in 2021

- Cytokine Release Syndrome
- Allergic Inflammation
- Autoimmune Disease

The timing of clinical trial initiation and completion depends, in part, on restrictions related to COVID-19, the availability of clinical research facilities and staffing, and the ability to recruit patients.

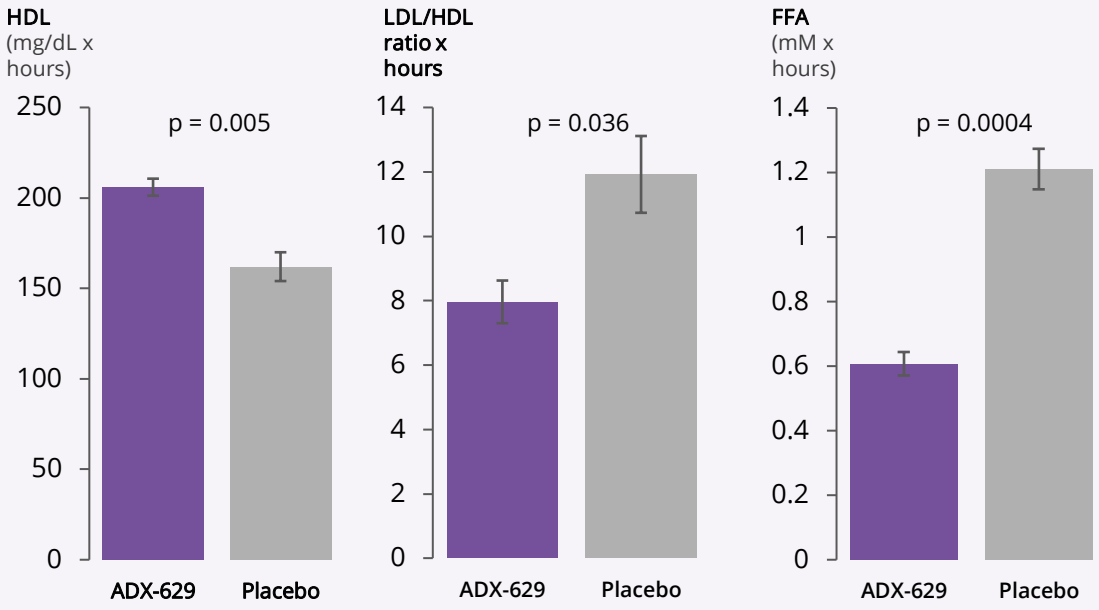
ADX-629 Reduced RASP vs. Placebo in Phase 1 Clinical Trial, Demonstrating Target Engagement, and Also Improved Lipid Profiles

MDA LEVELS OVER 10 DAYS OF DOSING



Area under the curve is over four hours post-dose; p-values subject to quality control analysis.
Source: ADX-629 Phase 1 clinical trial results.

PLASMA LIPID PROFILE AFTER FATTY MEAL



MDA = Malondialdehyde
MMRM = Mixed Model Repeated Measures
Day 10 = Food effect assessment
HDL = High-density lipoprotein
LDL = Low-density lipoprotein
FFA = Free fatty acids

May 2021

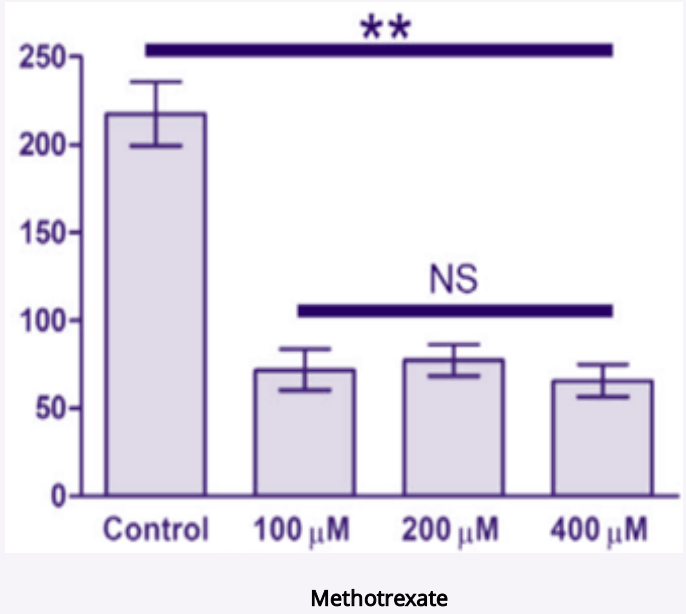
ADX-2191

Dihydrofolate Reductase Inhibition

Nasdaq: ALDX

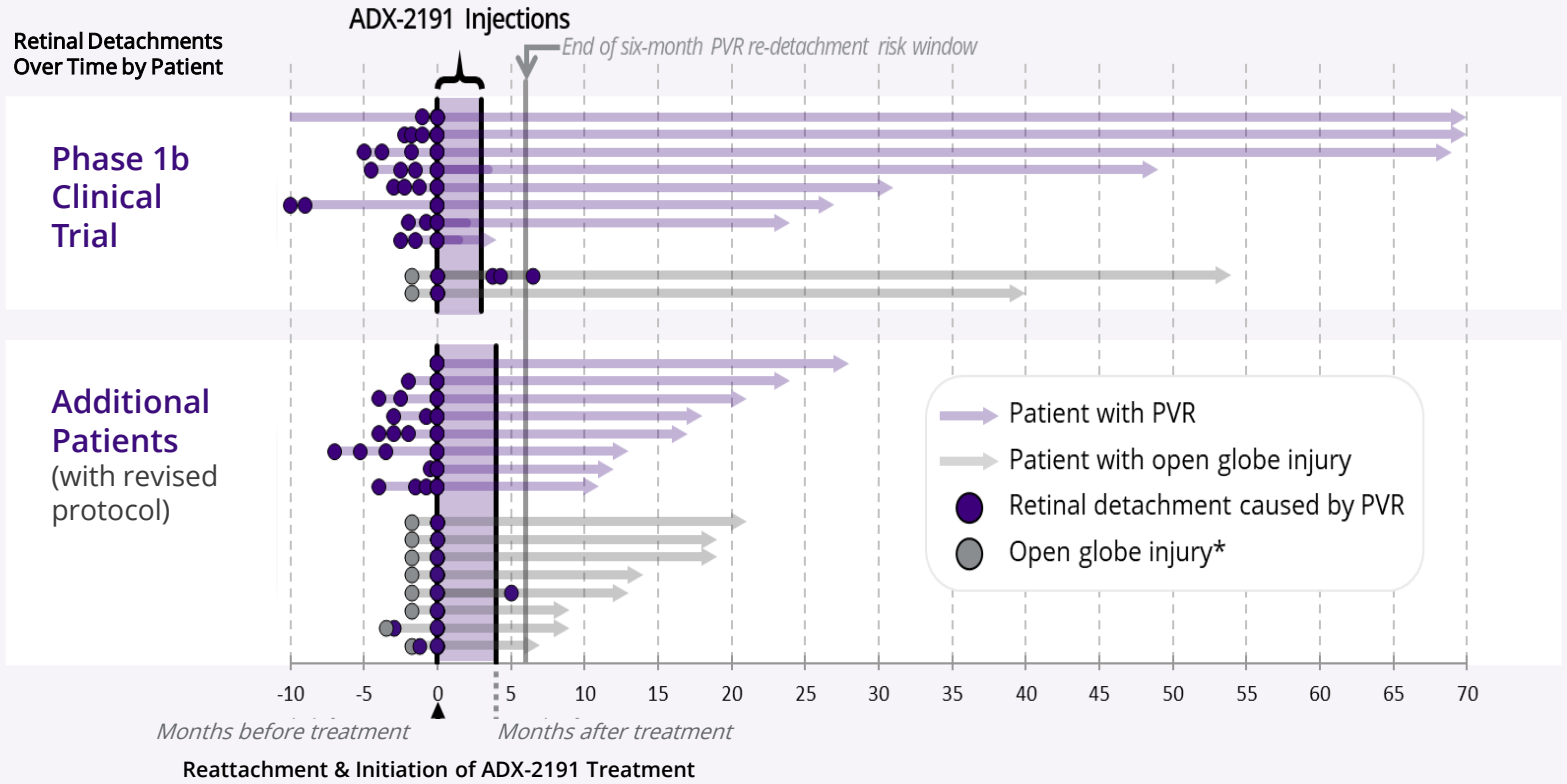
ADX-2191, a Novel Intravitreal Formulation of Methotrexate, Represents a Clinically Proven Systems Modulating Approach

Preclinical reduction in cellular proliferation



Source: Invest Ophthalmol Vis. Sci. 2017; 58:3940–3949

Clinical reduction in retinal detachment



*Timing of open globe injury as shown is estimated. Typically 6-8 weeks prior to reattachment & initiation of ADX-2191. There is no assurance that prior results, such as signals of safety, activity or durability of effect, observed from this open label investigator sponsored trial will be replicated in more rigorous clinical trials involving ADX-2191. **Source:** ADX-2191 PVR Phase 1b investigator sponsored clinical trial (n=10) results and additional in-practice use (n=16). ** = p value ≤ 0.01 **NS** = Not Significant **PVR** = Proliferative vitreoretinopathy

ADX-2191 Represents a Novel Approach and Potential Therapeutic Option For Proliferative Vitreoretinopathy Treatment

PROLIFERATIVE VITREORETINOPATHY (PVR)

PVR is a **rare disease**, with ~4,000 patients per year in the U.S. and nearly twice as many in Europe and Japan combined.

Left untreated, retinal detachment due to **PVR can progress to permanent blindness.**

There is currently **No FDA- or EMA-approved therapy**.

Repeat surgery, which can lead to **vision loss**, is currently the only possible course of action.

ADX-2191

A **potential therapeutic option** for the treatment of PVR

Granted U.S. orphan designation and FDA fast track designation for the prevention of PVR

Tolerability and reattachment success during study period **demonstrated in Phase 1b** open-label investigator sponsored clinical trial

GUARD adaptive Phase 3 clinical trial for the prevention of recurrent retinal detachment due to PVR ongoing

Source: Aldeyra internal estimates based on primary and secondary market research; published literature

PVR = Proliferative vitreoretinopathy

ADX-2191: GUARD Trial Design in Proliferative Vitreoretinopathy Adaptive Phase 3 (Part 1) Clinical Trial Design

COMPLETION OF ENROLLMENT EXPECTED IN 2021

Primary Objective
Evaluate efficacy of intravitreal ADX-2191 injections for prevention of recurrent retinal detachment due to PVR

Design
Multi-center, randomized, controlled, two- part, adaptive Phase 3 clinical trial

Inclusion Highlights

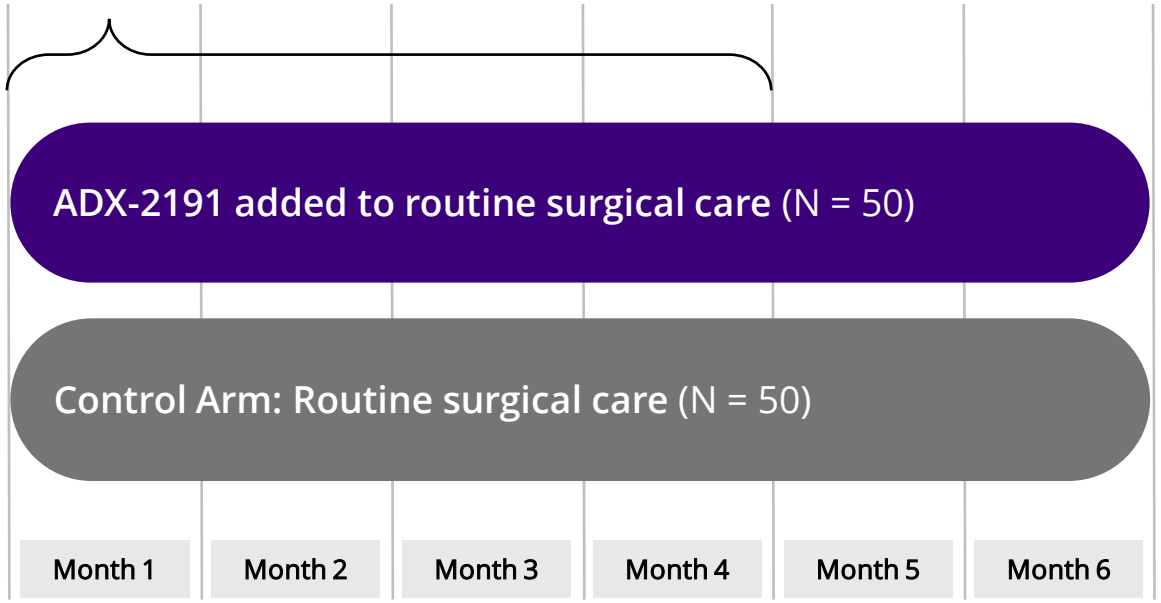
- Recurrent retinal detachment due to PVR, or
- Retinal detachment associated with open-globe injury

Dosing Regimen
At surgery, weekly (x8), and then every other week (x4) intravitreal ADX-2191 injections

Endpoint
Retinal re-detachments due to PVR requiring re-operation within 6 months:

1. OCT demonstrating fovea-off retinal detachment
2. Photographic documentation retinal detachment

ADAPTIVE PHASE 3 PVR CLINICAL TRIAL DESIGN: PART 1



*The timing of ongoing clinical trials depend, in part, on restrictions related to COVID-19, the availability of clinical research facilities and staffing, and the ability to recruit patients.

PVR = Proliferative Vitreoretinopathy **OCT** = Optical Coherence Tomography

Experienced Management Team and Board of Directors

MANAGEMENT TEAM

Todd Brady, M.D., Ph.D.
President, CEO & Director

Joshua Reed, M.B.A.
Chief Financial Officer

Stephen Machatha, Ph.D.
Chief Development Officer

BOARD OF DIRECTORS

Richard Douglas, Ph.D. Chairman	Former SVP Corporate Development at Genzyme
Ben Bronstein, M.D.	Former CEO Peptimmune[7]
Marty Joyce, M.B.A.	Former CFO of Serono USA
Nancy Miller-Rich	Former SVP BD&L and Commercial Strategy at Merck
Gary Phillips, M.D.	CEO OrphoMed
Neal Walker, D.O.	CEO Aclaris Therapeutics
Todd Brady, M.D., Ph.D.	CEO Aldeyra Therapeutics

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1. Acquired by Xanthus/Antisoma **2.** Acquired by Schwarz/UCB **3.** Acquired by Takeda **4.** Acquired by Ligand **5.** Acquired by Merck **6.** Acquired by Alexion **7.** Acquired by Genzyme

Upcoming Planned Clinical Milestones*

Phase 3 TRANQUILITY and TRANQUILITY-2 **top-line results H2 2021**

Phase 3 GUARD Trial **completion of enrollment in 2021**

Phase 2 clinical trials of ADX-629 **top-line results in cytokine release syndrome, allergic inflammation and autoimmune disease in 2021**

Aldeyra plans to meet with the U.S. FDA in the second half of 2021 to discuss the INVIGORATE results and the potential submission of a New Drug Application.

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Compelling Value Proposition

NOVEL SYSTEMS-BASED APPROACHES FOR IMMUNOLOGY

- RASP-inhibition represents a first-in-class therapeutic approach.
- Three unique immune-modulating mechanisms of action in development.

NEAR-TERM DEVELOPMENT CATALYSTS*

- Phase 3 TRANQUILITY and TRANQUILITY-2 results in dry eye disease expected 2H 2021.
- ADX-629 Phase 2 clinical testing results in asthma, psoriasis, and COVID-19 expected 2H 2021.

LARGE AND UNDERSERVED MARKET OPPORTUNITY

- Lead product candidate reproxalap targets a U.S. addressable market of >$20B.
- Significant potential commercial advantages of reproxalap in two blockbuster ocular indications.

SOLID CASH POSITION

- Cash, cash equivalents and marketable securities of $138.4M as of 3/31/2021
- Cash runway through the end of 2023, based on projected operating expenses**

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*Timing depends, in part, on restrictions related to COVID-19, the availability of clinical research facilities and staffing, the ability to recruit patients, and regulatory feedback.
**Raised $125 million, before deduction of underwriting discounts and commissions and other offering expenses, in gross proceeds in May 2021 underwritten public offering. Runway based on the company's Q1 2021 financial results press release dated May 6, 2021.

May 2021

CORPORATE OVERVIEW

Innovative Approaches to Regulating Immune Response

Nasdaq: ALDX