Transforming Patients' Lives – Focused on Functional Cures for Immunological Disorders

July 2026

CUE® BIOPHARMA

Cautionary Note Regarding Forward Looking Statements

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This presentation contains estimates and other statistical data made by independent parties and by us relating to market size and other data about our industry. This data involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such data and estimates. In addition, projections, assumptions and estimates of our future performance and the future performance of the markets in which we operate are necessarily subject to a high degree of uncertainty and risk.

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Cue Biopharma

A Precision Immuno-engineering Company Targeting Functional Cures For Immune Disorders with High Unmet Need

Augmenting and advancing a robust portfolio of new therapies with transformative potential

- CUE-221: A novel anti-IgE program with a unique dual-mechanism of action in Phase 2 for allergic disease
- CUE-401: A potential first-in-class bifunctional IL-2 and TGF-β molecule which highlights the Nobel Prize winning science of regulatory T cells for autoimmune disease[1]; advancing into Phase 1 development

Multiple milestones

- Submission of INDs for each program in preparation for the next clinical studies
- CUE-221 Phase 2 data readout by the end of the third quarter 2026 (Ascendant CSU Study)
  - Advancement to global Phase 2b trial in food allergy
- CUE-401 Initiation of Phase 1 study by year-end 2026

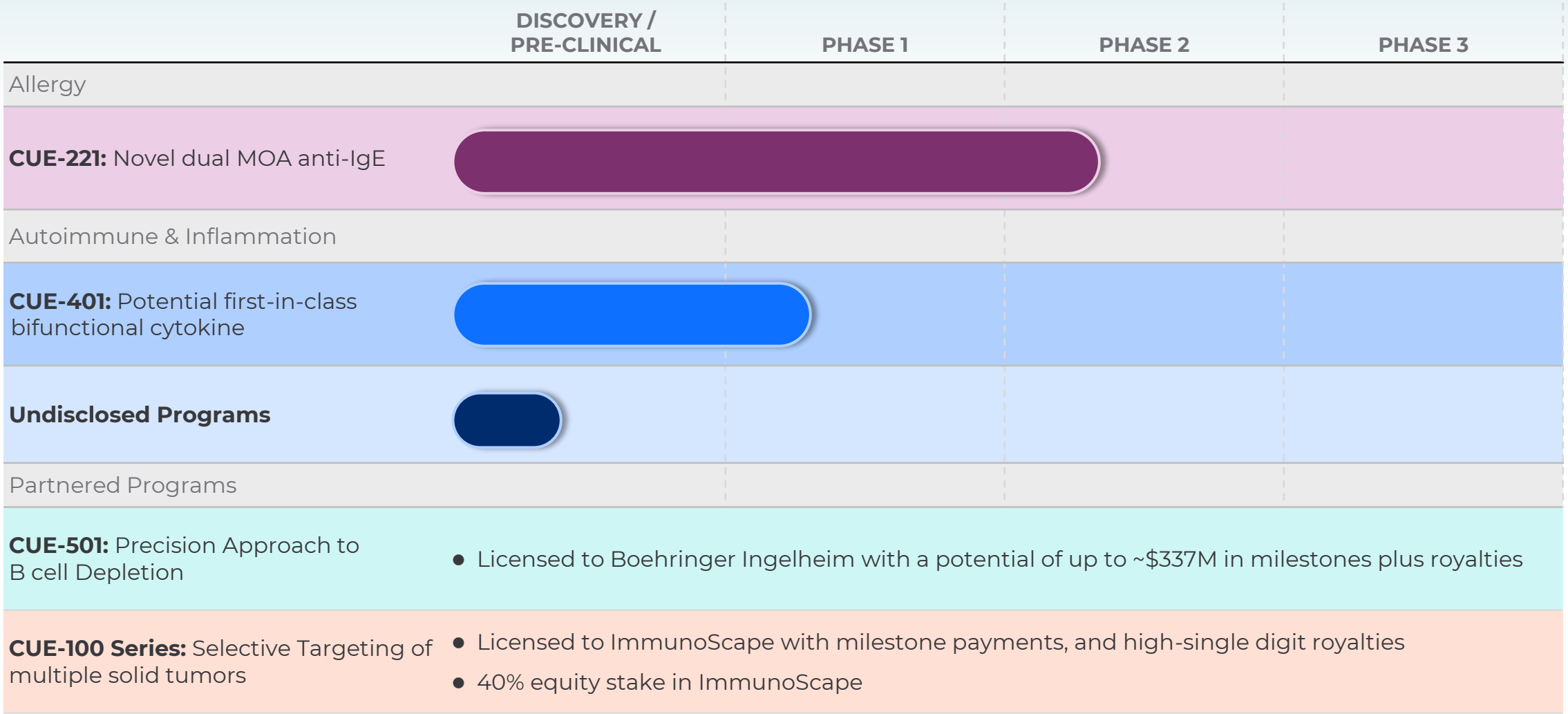
Company funded with cash runway through these milestones with potential for significant value inflection

Creates complementary team with expertise across portfolio to support CUE's strategic acceleration of growth

1. N. Mikami, R. Kawakami, K.Y. Chen, A. Sugimoto, N. Ohkura, & S. Sakaguchi, Epigenetic conversion of conventional T cells into regulatory T cells by CD28 signal deprivation, Proc. Natl. Acad. Sci. U.S.A. 117 (22) 12258-12268, https://doi.org/10.1073/pnas.1922600117 (2020); Press release. NobelPrize.org. Nobel Prize Outreach 2026. Wed. 6 May 2026. https://www.nobelprize.org/prizes/medicine/2025/press-release/

Expanding the Immunology Portfolio

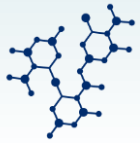
Clinical-Stage anti-IgE Added to a Portfolio Anchored by a Potential First-in-Class Autoimmunity Asset



Allergy
CUE-221: Novel dual MOA anti-IgE

Differentiated Science Validated by Consistent Clinical Data

Provides CUE-221 Potential to Outperform Existing And Emerging Anti-IgE Therapies



Functionally distinct dual MOA

- Humanized anti-IgE IgG1 mAb **uniquely engineered by the innovators of omalizumab**
- Unique binding to IgE with distinct IgE conformation
- **Neutralizes free IgE with higher potency than omalizumab and unlike other anti-IgE's, down-regulates IgE synthesis**
- Robust preclinical safety profile

Consistent clinical data reinforce benchmark-setting potential in allergic disease

- **Rapid, durable IgE suppression** below limit of quantification, maintained beyond peak PK
- Supports anti-IgE pharmacodynamic activity in high-IgE patients
- Clinically meaningful improvements in CSU symptom scores
- PD supports dosing ≥ QM
- Well tolerated and safe

Advancing toward late-stage value inflection

- **CUE-221 Phase 2 with placebo and active comparator; data readout expected by the end of 3Q 2026** (Ascendant CSU Study)
- Testing 3 SC QM doses vs placebo and omalizumab
- Primary Endpoint: HSS7 = 0 at week 12
- Will provide opportunity to further benchmark efficacy and refine dosing schedule

Driving next phase of growth through potential best-in class innovation

- Potential best-in class efficacy will be tested in global P2b study in food allergy
- **Food allergy is an IgE-driven disease, underscoring the potential of a therapy that neutralizes free IgE and blocks new IgE production**
- A second P2b/3 in CSU will follow based on readout from P2 CSU China study

There is a Massive Unmet Need in Our Global Beachhead Indication: Food Allergy

377%

Claim lines with diagnoses of anaphylactic food reactions increased 377 percent between 2007 and 2016

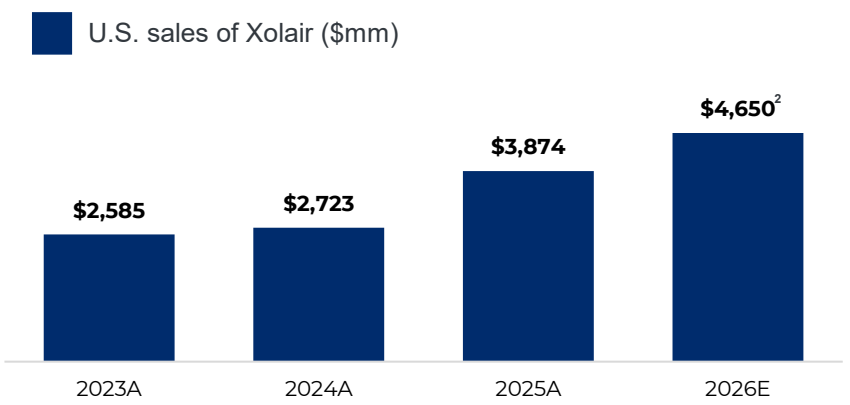
1 in 10 adults

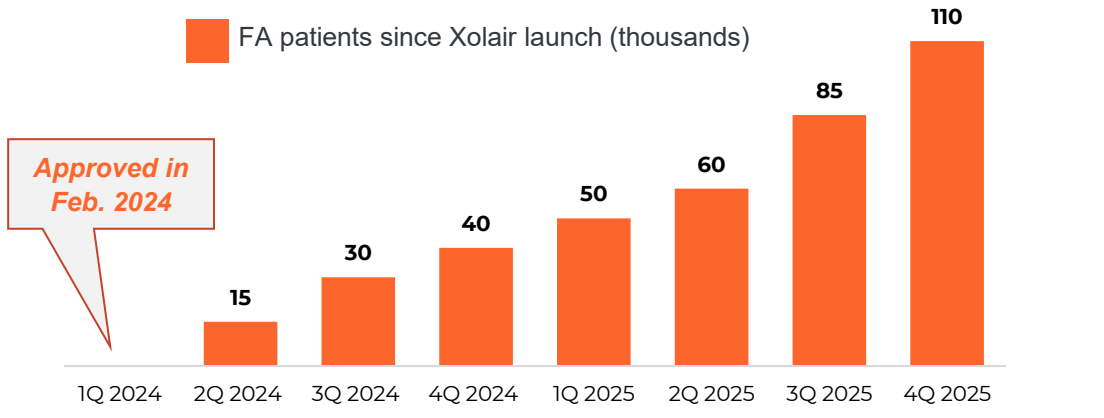
51% More than half of adults with food allergies have experienced a severe reaction

1 in 13 children

42% More than 40% of children with food allergies have experienced a severe reaction

AFTER FDA APPROVAL FOR FOOD ALLERGIES IN EARLY 2024, XOLAIR[1] SALES ARE INFLECTING



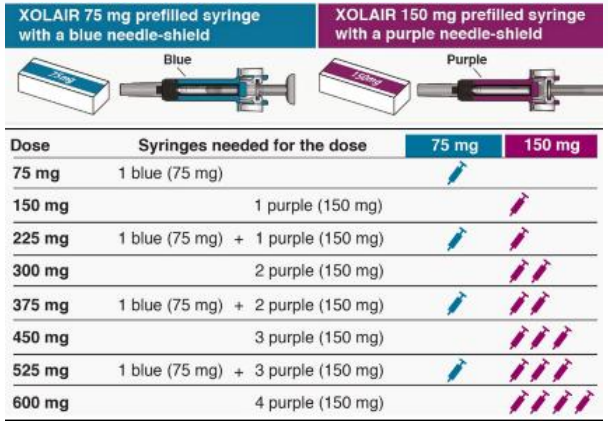


Source: Wall Street equity research; Food Allergy Research & Education (FARE), "Food Allergy Facts and Statistics," accessed 04/06/2026
Note: FA = food allergy; [1] Xolair is current standard of care. [2]Roche provided verbal guidance of 20% growth for Xolair in 2026 during the FY-2025 earnings call

Omalizumab and an Omalizumab Biosimilar are the Only FDA-Approved Anti-IgE Therapies [1,2]

Significant Unmet Need Remains

- **Omalizumab works by neutralizing IgE[1]**
  - In IgE mediated food allergy, patients are dosed every 2 to 4 weeks and may require up to 4 injections
  - Patients with high baseline IgE levels > 1850 IU/mL are not eligible for treatment[1]
- **Other emerging anti-IgE therapies appear to only offer incremental improvements**
  - Longer half-life which may improve convenience, not efficacy[3]
  - Novel mechanisms of action that are still in early clinical development, with clinical validation yet to be established[4]



Dose	Syringes needed for the dose	75 mg	150 mg
75 mg	1 blue (75 mg)	1	
150 mg	1 purple (150 mg)		1
225 mg	1 blue (75 mg) + 1 purple (150 mg)	1	1
300 mg	2 purple (150 mg)		2
375 mg	1 blue (75 mg) + 2 purple (150 mg)	1	2
450 mg	3 purple (150 mg)		3
525 mg	1 blue (75 mg) + 3 purple (150 mg)	1	3
600 mg	4 purple (150 mg)		4

Source: 1. Xolair (omalizumab) US Prescribing Information, 2. OMLYCLO (omalizumab-igec) US Prescribing Information 2025; 3. Shen et al Clinical and Translational Science, 2025; 4. Becklund et al. J Allergy Clin Immunol, 2022 and Brigger et al. J Allergy Clin Immunol 2025

CUE-221 is a Functionally Distinct Novel Dual MOA Anti-IgE Therapy, with Pipeline-in-a-Product Potential

CUE-221
Dual mechanism anti-IgE

Potential Future Indications

CSU	**FOOD ALLERGY**
~86mm WW patients	~214mm WW patients
ATOPIC DERMATITIS	**ASTHMA**
~287mm WW patients	~223mm WW patients
ALLERGIC RHINITIS	**ANAPHYLAXIS**
~427mm WW patients	~171mm WW patients

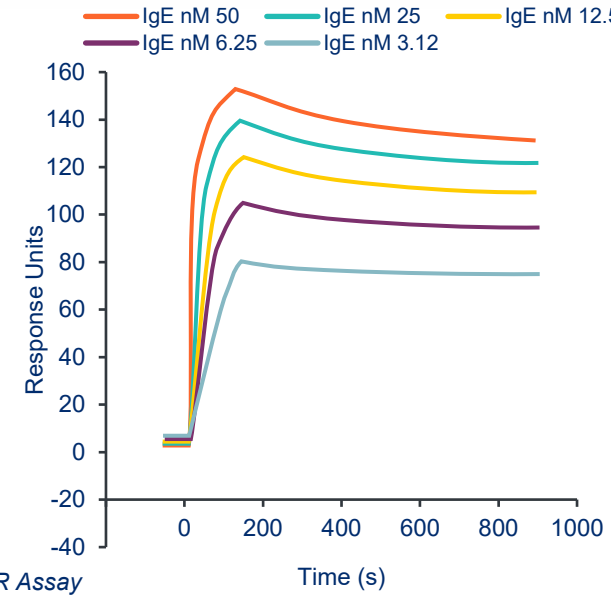
Significant unmet need remains across the large opportunities in allergic disease

Source: Company filings, Wall Street equity research, World Health Organization, United Nations Department of Economic and Social Affairs, and academic research Note: Patient populations and TAM figures are WW estimates for 2030; IgE = Immunoglobulin E; CSU = chronic spontaneous urticaria

CUE-221: Designed for Deeper and Durable IgE Suppression

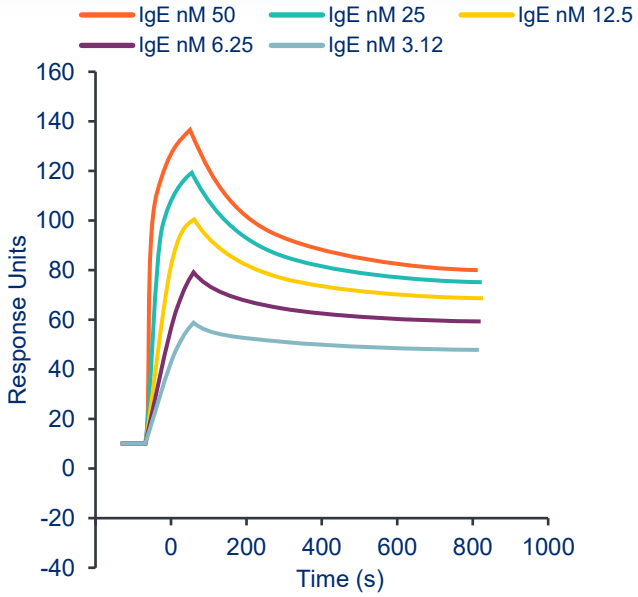
Higher binding affinity (picomolar range) and slower dissociation (off-rate) than omalizumab

CUE-221



SPR Assay

OMALIZUMAB



- Humanized anti-IgG1 mAb engineered by the innovators of omalizumab
- Binds IgE at distinct epitopes, inducing a unique conformational change versus existing and emerging anti-IgE therapies
- Combines allosteric and orthosteric inhibition of FceRI binding
- 4 to 8-fold higher IgE binding affinity and slower dissociation (off-rate) than omalizumab

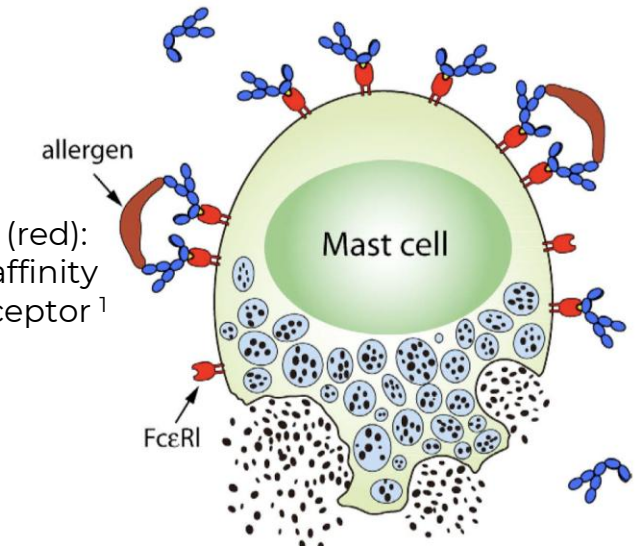
Source: Kuo et al. J Clin Invest. 2022 and data on file.

IgE Drives Allergic Disease by Engaging Two Critical Receptors

FcεRI and CD23 (FcεRII) regulate the allergic response

Cross-linking the FcεRI receptor leads to allergic reaction

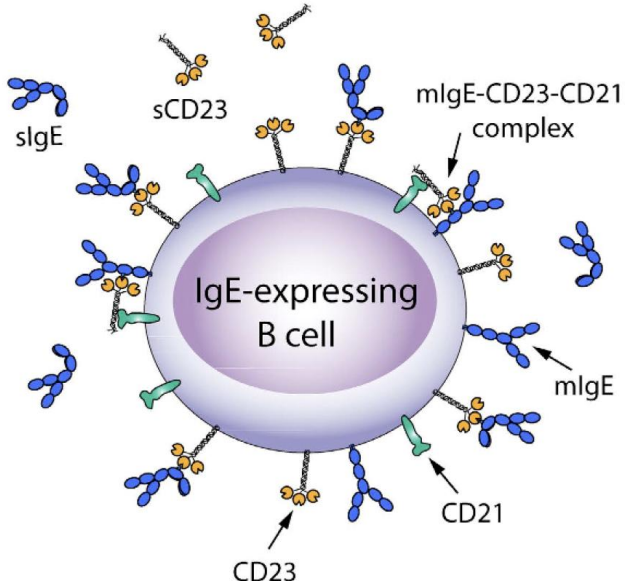
IgE binds to FcεRI receptor on the surface of mast cells



FcεRI (red): high-affinity IgE receptor [1]

Membrane bound CD23 suppresses IgE production when bound by IgE

CD23 receptor regulates IgE synthesis[2]



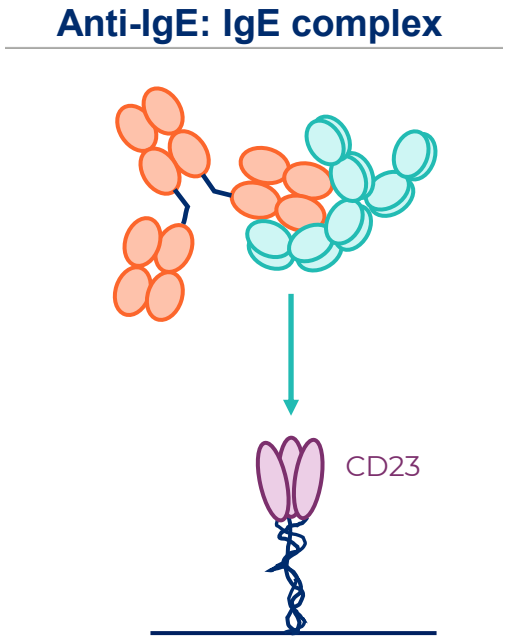
CD23 (yellow): low-affinity IgE receptor [1]

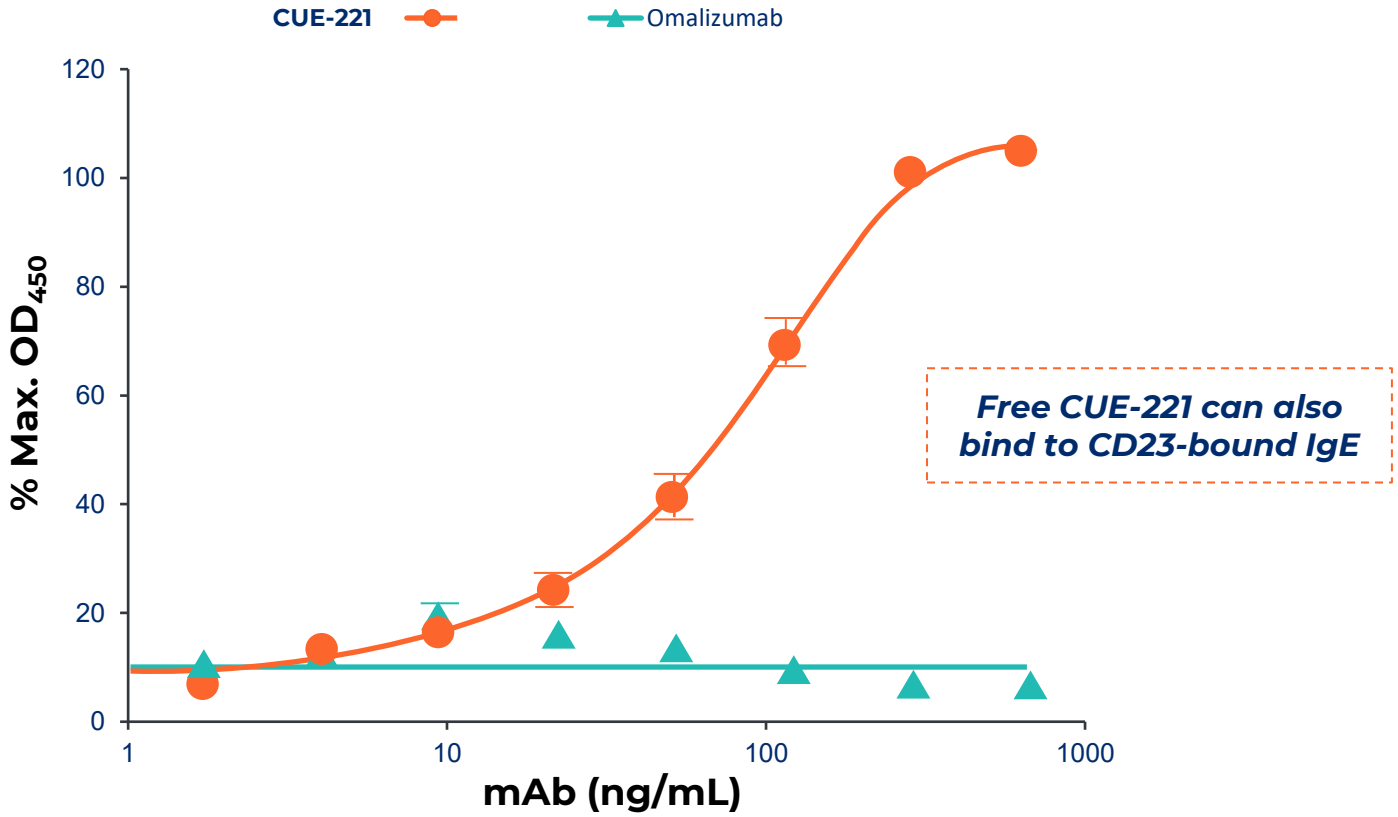
Soluble CD23 promotes IgE synthesis

Source: [1] Wright et al 2015 Nature Scientific Reports; [2] Engeroff and Vogel 2020 Allergy

CUE-221's Differentiated IgE Binding Enables Distinct Functional Properties, Including Preserved Interaction with CD23-Bound IgE

CUE-221 does not block IgE binding to CD23, preserving CD23's natural regulatory function in high-IgE states



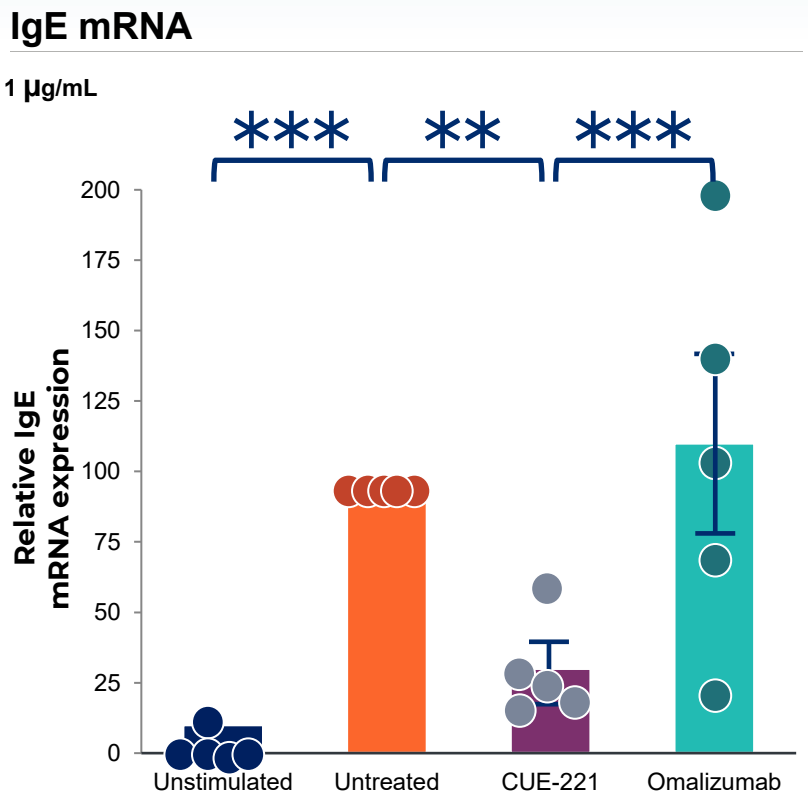


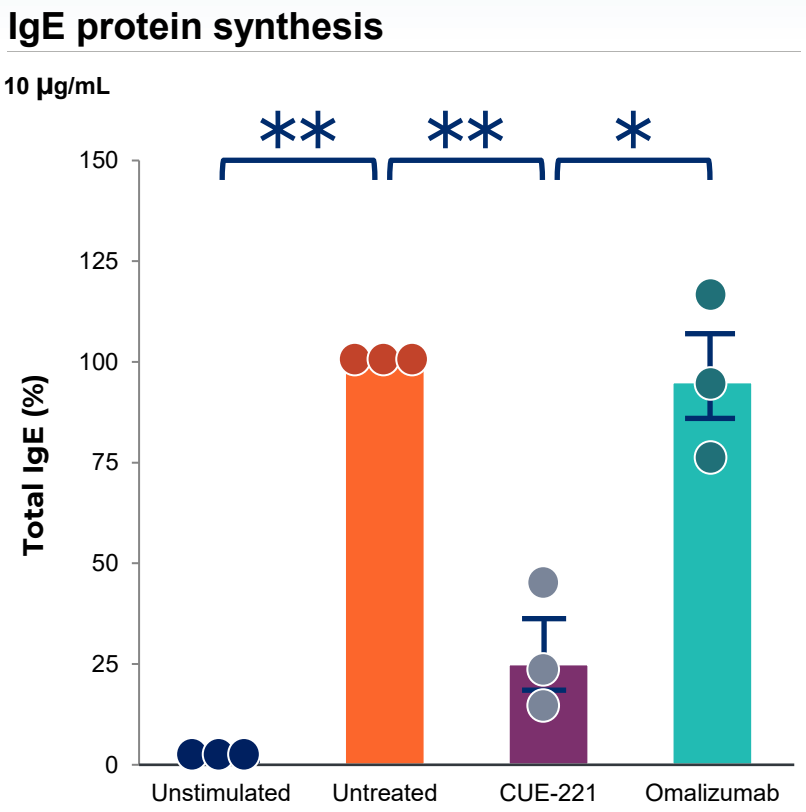
CD23-immobilized ELISA with IgE preloaded

Source: Kuo et al. J Clin Invest. 2022

CD23 Acts as a Natural Brake on IgE Production in High IgE States

CUE-221 leverages the CD23-mediated IgE downregulation pathway, suppressing IgE mRNA and protein synthesis[1]

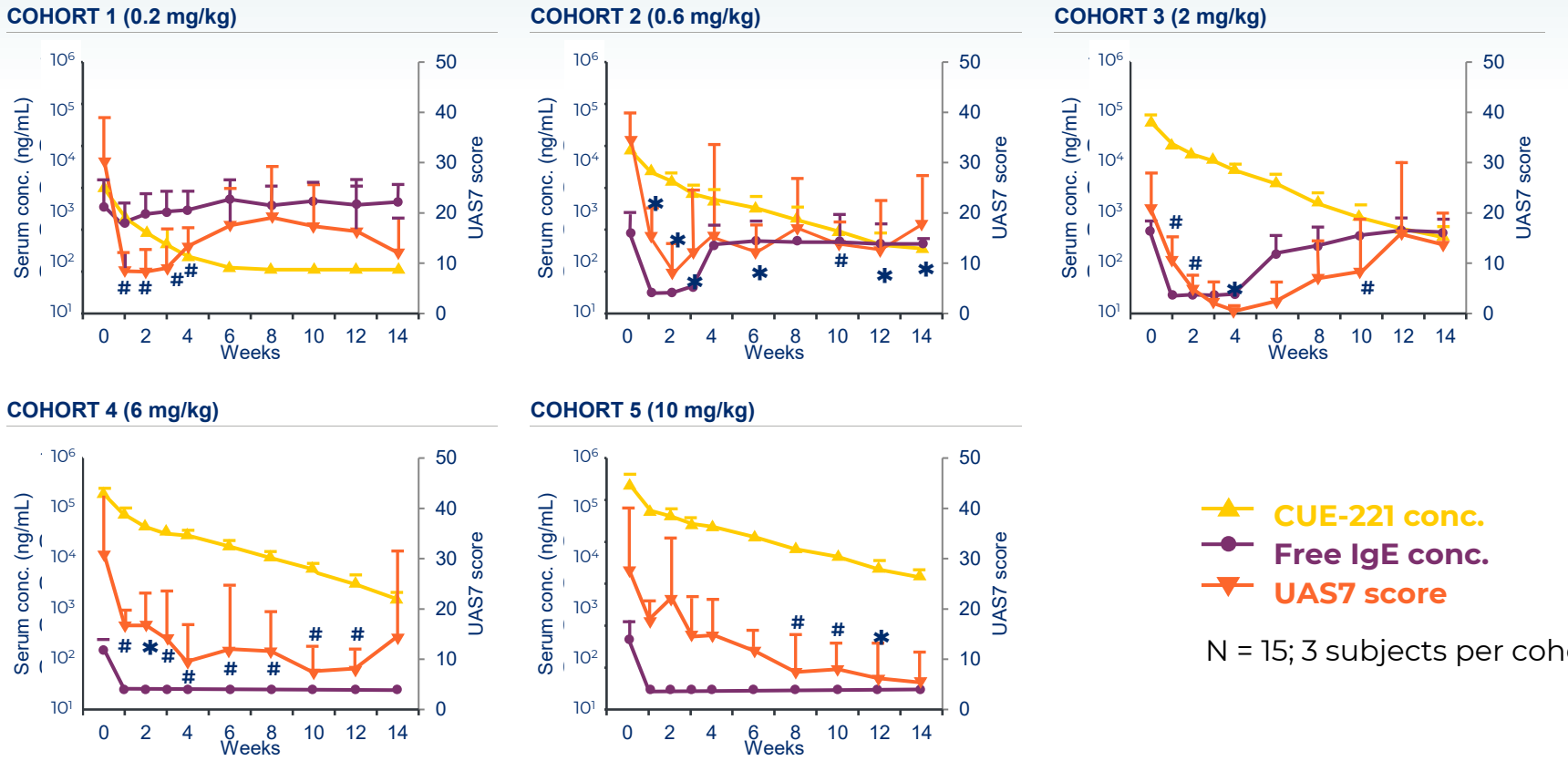




Source: Adapted from Kuo et al. J Clin Invest. 2022
Note: [1] Human PBMCs were stimulated with IL-4 and anti-CD40 to induce IgE production, treated with mAbs for 11 days; Total IgE (by ELISA) and IgE mRNA levels (by real-time PCR; data not shown) measured relative to untreated controls; The unstimulated group corresponds PBMCs in which NO IL-4 and NO anti-CD40 was added, and thus is the background IgE (low/undetectable); The untreated group corresponds to a group that was stimulated with IL-4 + anti-CD40 but NO anti-IgE antibody added. This group produces a full IgE response and is used as the reference/baseline (100%).

P1 SAD: Rapid and Prolonged Single-Dose PD Effect

Consistent with Dual IgE Neutralization and Down-regulation of Synthesis



N = 15; 3 subjects per cohort

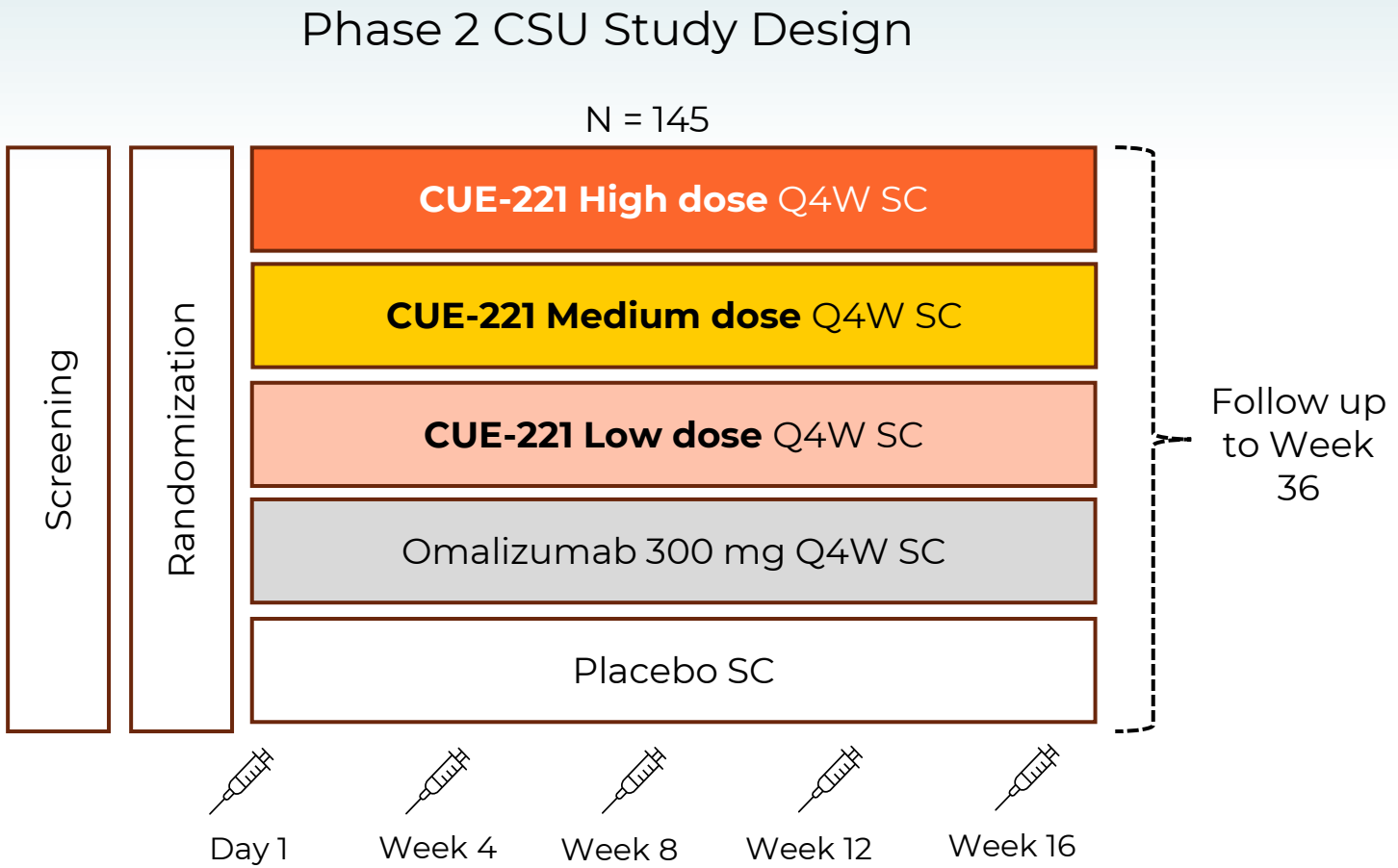
Durable reduction in free IgE beyond peak PK; improvement in symptom scores

Source: Kuo et al. J Clin Invest. 2022

Potential for a Significant Value Inflection with Phase 2 CSU Study Results by the end of 3Q 2026

Phase 2 Study in China with placebo and active comparator (Ascendant CSU Study)

Will provide opportunity to further benchmark efficacy and refine dosing schedule for future global Phase 2 studies



Source: Data on File; CSU = chronic spontaneous urticaria; SC = subcutaneous; HSS7 = Hives severity score over 7 days

Autoimmune & Inflammation
401: Potential first-in-class bifunctional cytokine

CUE-401: A Potential First-in-Class Bifunctional Cytokine

Novel bispecific fusion protein	Broad in Vivo Efficacy Across Immune-mediated Disease Models	Near term value inflection with clear path to clinic
• **Combines** affinity-attenuated **IL-2 and TGF-β cytokines** delivering two key Treg-supporting signals in a single molecule • Engineered to attenuate TGF-β activity and **preferentially enable signaling on IL-2 receptor expressing cells**, to enhance specificity and reduce potential for off-target effects • Designed to **promote FOXP3⁺ Treg induction** and **expansion**	• Robust **in vivo proof-of-mechanism** and functional efficacy in various animal models of disease including autoimmune gastritis, EAE model of multiple sclerosis and GVHD • **Suppresses pro-inflammatory cytokine signaling** while promoting immune tolerance	• Manufacturing production established • IND-enabling studies completed • **IND submission** and **P1 study start by year end 2026** • Broad landscape of potential **opportunities to address high unmet need** in autoimmune disease

Abbreviations: EAE = Experimental autoimmune encephalomyelitis; GVHD = graft-versus-host disease

2025 Nobel Prize Recognized Importance in Understanding of FOXP3⁺ Tregs as Central Regulators of Immune Tolerance[1,2]

Nature publication provides external validation of dual IL-2 and TGF-β agonism as a differentiated approach for durable immune tolerance with reduced off-target effects[3]

Nobelförsamlingen
The Nobel Assembly at Karolinska Institutet

Scientific background

Scientific background to the Nobel Prize in Physiology or Medicine 2025: Immune tolerance. The identification of regulatory T cells and FOXP3 (pdf)

PRESS RELEASE
6 October 2025

The Nobel Prize in Physiology or Medicine 2025

The Nobel Assembly at Karolinska Institutet has decided to award the Nobel Prize in Physiology or Medicine 2025 to:

Mary E. Brunkow
Institute for Systems Biology, Seattle, USA

Fred Ramsdell
Sonoma Biotherapeutics, San Francisco, USA

Shimon Sakaguchi
Osaka University, Osaka, Japan

"for their discoveries concerning peripheral immune tolerance"

They discovered how the immune system is kept in check

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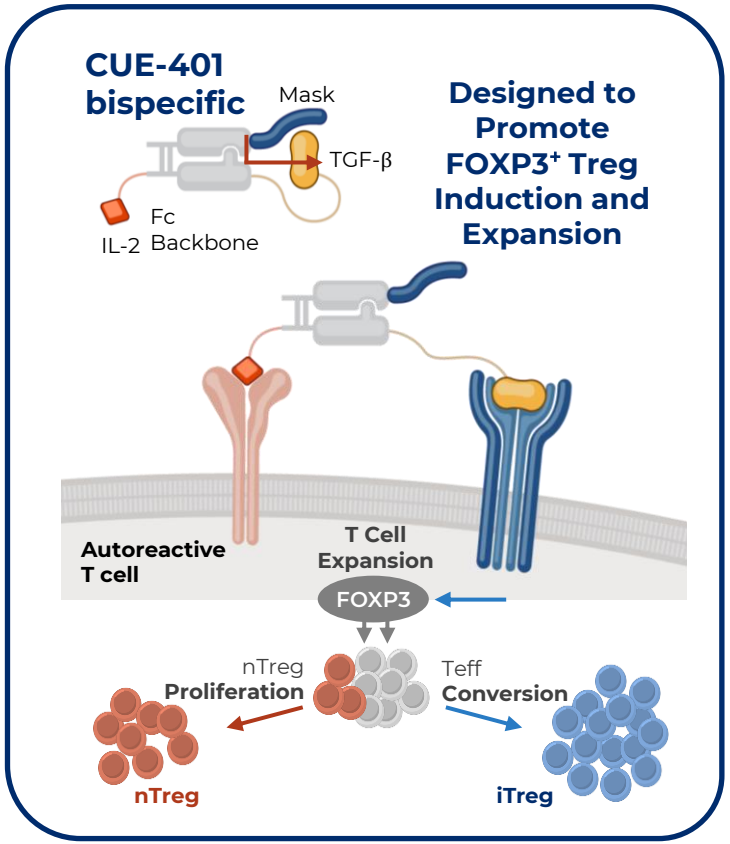
Facile induction of immune tolerance by an interleukin-2–TGFβ surrogate agonist

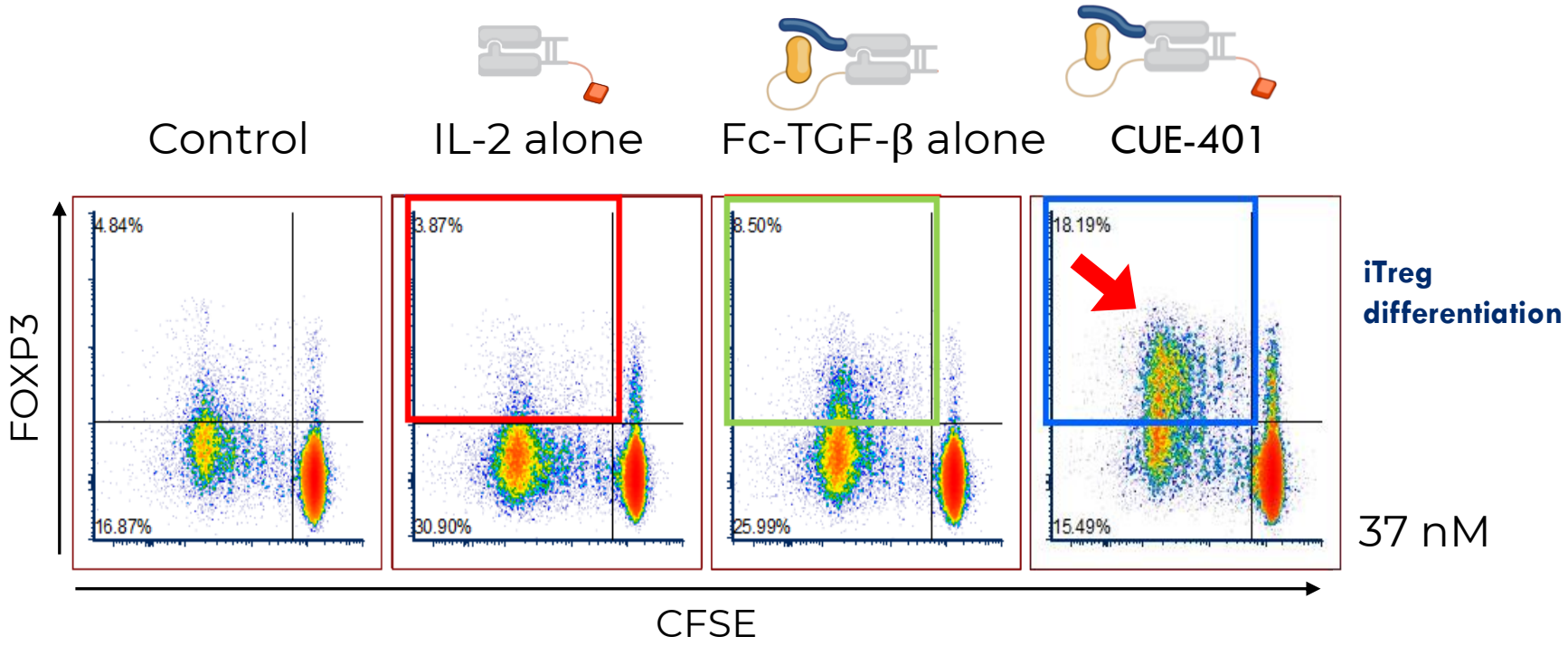
CUE-401: Bi-functional Agonist Combining Affinity-attenuated IL-2 and TGF-β Cytokines



1. N. Mikami, R. Kawakami, K.Y. Chen, A. Sugimoto, N. Ohkura, & S. Sakaguchi, Epigenetic conversion of conventional T cells into regulatory T cells by CD28 signal deprivation, Proc. Natl. Acad. Sci. U.S.A. 117 (22) 12258-12268, https://doi.org/10.1073/pnas.1922600117 (2020); 2. Press release. NobelPrize.org. Nobel Prize Outreach 2026. Wed. 6 May 2026. https://www.nobelprize.org/prizes/medicine/2025/press-release/ 3. Sun et al. 2026 Nature Reviews

Dual IL-2 and TGF-β Signaling Drives Immune Reprogramming Toward Tolerance

In vitro studies demonstrate FOXP3 induction and proliferation with CUE-401 dual agonism



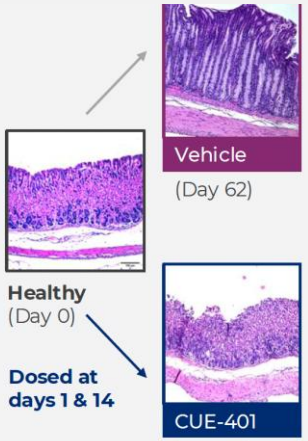
Source: Sponsored Research Collaboration with Dr. Richard DiPaolo, St. Louis University;
Abbreviations: CFSE = Carboxyfluorescein succinimidyl ester; iTreg = induced T regulatory cell; moDC =monocyte-derived dendritic cells

IL-2 and TGF-β Agonism Demonstrates Activity Across Inflammatory Diseases, Supporting a Platform for Immune Tolerance

Broad in vivo efficacy across immune-mediated disease models

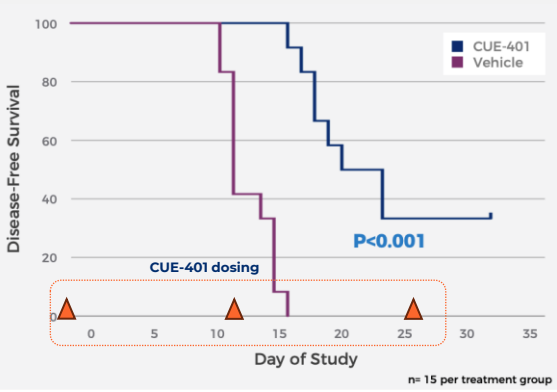
Suppresses pro-inflammatory cytokine signaling

Prevention of Autoimmune Gastritis

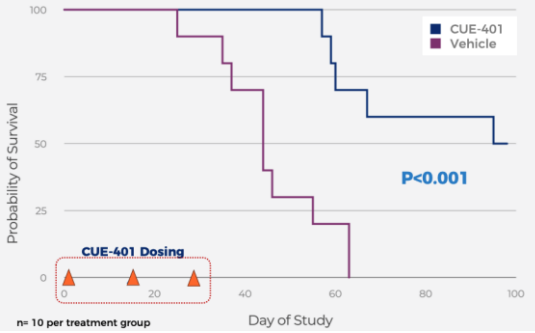


Attenuation of Disease Development and Delay of Onset in EAE

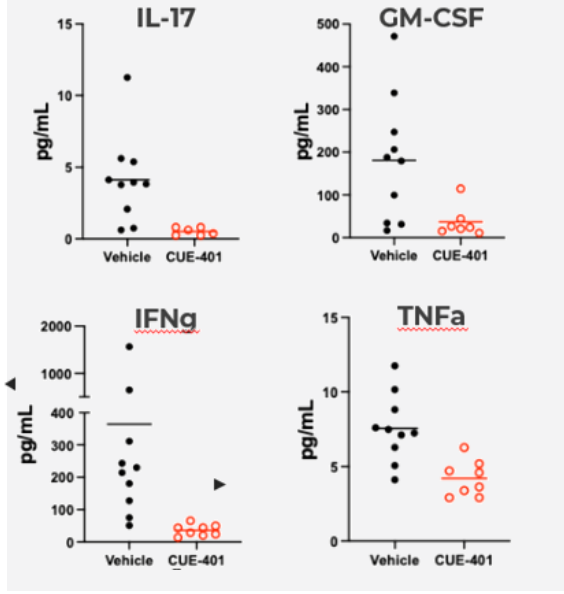
Across 35 days



GVHD: Delayed Development and Increased Overall Survival[1]



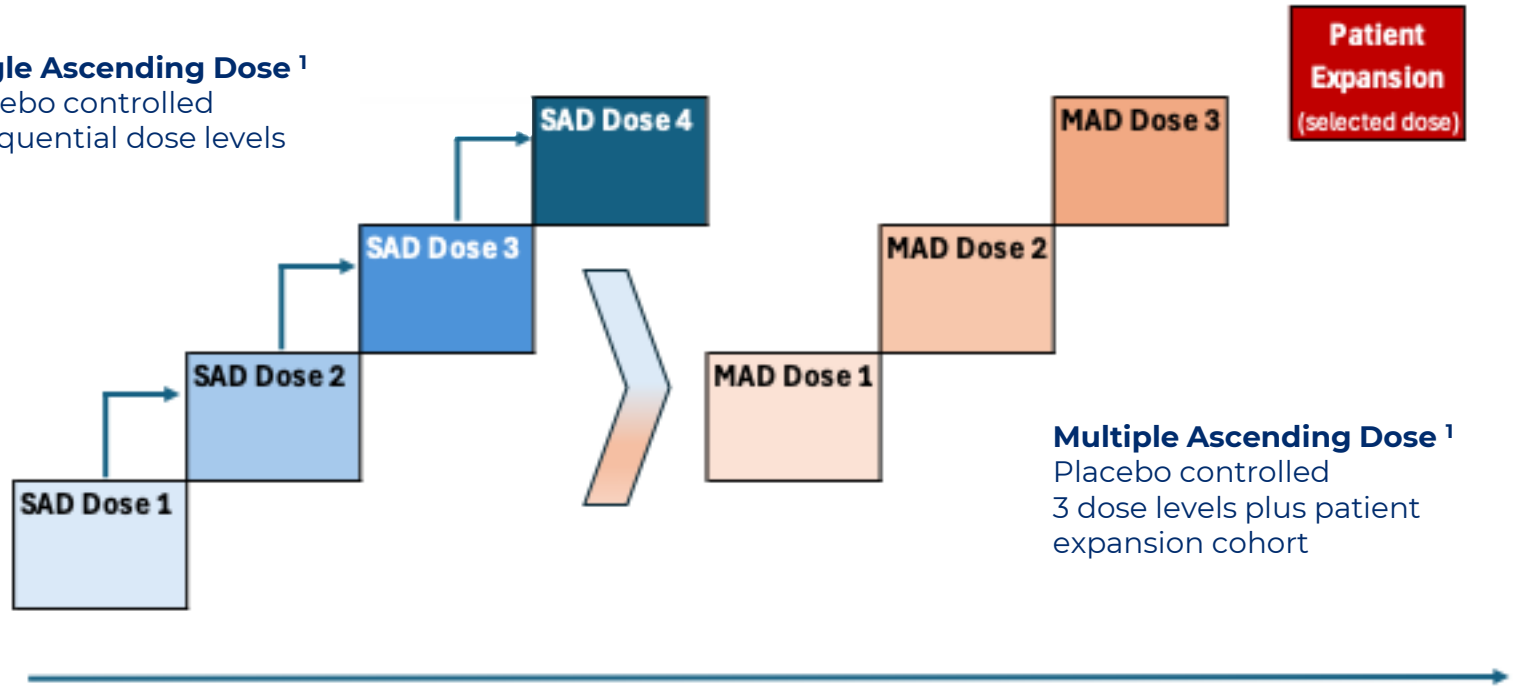
Suppresses pro-inflammatory cytokine signaling



Source: Peterson et al 2018 J of Autoimmunity; Girgis N et al., 2025,CUE-401: A Novel TGF-beta/IL-2 Fusion Protein for the Induction Expansion of FOXP3+ Regulatory T Cells. Cytokines conference, Seattle, Washington USA
Note: [1] Wild-type IL-2 accelerates disease in xenogeneic GVHD model

Phase 1 Single and Multiple Ascending Dose Study In Healthy Volunteers with Patient Cohort Expansion

Single Ascending Dose [1]
Placebo controlled
4 sequential dose levels



Multiple Ascending Dose [1]
Placebo controlled
3 dose levels plus patient expansion cohort

[1] Optional cohorts may be added to refine dose levels given the potential for a narrow therapeutic window.

- **Safety and tolerability**
- **Immunogenicity**
- **Biomarker driven PK/PD characterization**
- **Exploratory efficacy in patients**

CUE is Advancing a Portfolio of Potentially Transformative Therapies Aimed at Enabling Functional Cures Across Immunological Disorders

Enhanced clinical-stage pipeline

- CUE-221: a **novel anti-IgE program** with a unique dual-mechanism of action in Phase 2 for allergic disease augmenting the portfolio that includes CUE-401
- CUE-401: Designed to be a first-in-class **bifunctional IL-2 and TGF-β** molecule which highlights the Nobel Prize winning science of regulatory T cells for autoimmune disease, advancing into Phase 1 development

Multiple near-term milestones

- **IND submissions in food allergy** (CUE-221) and **autoimmune disease** (CUE-401)
- **CUE-221 Phase 2 data** expected **by the end of 3Q 2026** (Ascendant CSU study)
  - Advancement of **CUE-221 to global Phase 2b trial in food allergy**
- **CUE-401 Phase 1** first-in-human study expected to be **initiated by YE 2026**

Well-positioned for significant value inflections

- Company **funded** with a cash runway projected to **cover milestones**
- Creates a **complementary** team with expertise across the portfolio to support the company's strategic acceleration of growth