Corporate Presentation

Immune Responses, On Cue™

Nasdaq: CUE | January 2020

Forward-Looking Statements

This presentation has been prepared by Cue Biopharma, Inc. (“we,” “us,” “our,” “Cue” or the “Company”) and is made for informational purposes only and does not constitute an offer to sell or a solicitation of an offer to buy securities, nor shall there be any sale of any securities in any state or jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such state or jurisdiction. The information set forth herein does not purport to be complete or to contain all of the information you may desire. Statements contained herein are made as of the date of this presentation unless stated otherwise, and neither this presentation, nor any sale of securities, shall under any circumstances create an implication that the information contained herein is correct as of any time after such date or that information will be updated or revised to reflect information that subsequently becomes available or changes occurring after the date hereof.

This presentation contains “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, that are intended to be covered by the “safe harbor” created by those sections. Forward-looking statements, which are based on certain assumptions and describe our future plans, strategies and expectations, can generally be identified by the use of forward-looking terms such as “believe,” “expect,” “may,” “will,” “should,” “would,” “could,” “seek,” “intend,” “plan,” “goal,” “project,” “estimate,” “anticipate,” “strategy,” “future,” “likely” or other comparable terms. All statements other than statements of historical facts included in this press release regarding our strategies, prospects, financial condition, operations, costs, plans and objectives are forward-looking statements. Examples of forward-looking statements include, among others, statements we make regarding anticipated results of our drug development efforts, including study results, our expectations regarding the timing of milestone events, regulatory developments and expected future operating results. Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based only on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, projections, anticipated events and trends, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict and many of which are outside of our control. Our actual results and financial condition may differ materially from those indicated in the forward-looking statements. Therefore, you should not rely on any of these forward-looking statements. Important factors that could cause our actual results and financial condition to differ materially from those indicated in the forward-looking statements include, among others, our limited operating history, limited cash and a history of losses; our ability to achieve profitability; our ability to secure required U.S. Food and Drug Administration (“FDA”) or other governmental approvals for our product candidates and the breadth of any approved indication; negative or inconclusive results from our clinical studies or serious and unexpected drug-related side effects or other safety issues experienced by participants in our clinical trials; delays and changes in regulatory requirements, policy and guidelines including potential delays in submitting required regulatory applications to the FDA; our reliance on licensors, collaborations and strategic alliances; our ability to obtain adequate financing to fund our business operations in the future; and the other risks and uncertainties described in the Risk Factors and in Management's Discussion and Analysis of Financial Condition and Results of Operations sections of our most recently filed Annual Report on Form 10-K and any subsequently filed Quarterly Report(s) on Form 10-Q. Any forward-looking statement made by us in this presentation is based only on information currently available to us and speaks only as of the date on which it is made. We undertake no obligation to publicly update any forward-looking statement, whether written or oral, that may be made from time to time, whether as a result of new information, future developments or otherwise.

CUE™
BIOPHARMA

Corporate Highlights

Disruptive Platform for T Cell Modulation *In Vivo*

- **Distinct mechanism of action** for the selective and specific modulation of disease relevant T cells
- **Modular therapeutic frameworks** enable potential to address a broad range of cancers and autoimmune diseases
- **Injectable biologics engineered** for production through industry-standard manufacturing, without the need for ex vivo manipulation

Focused Execution Against Platform Validation

- **CUE-101 in Phase 1** for recurrent/ metastatic HPV+ head and neck cancer with initial translational readout expected 1H 2020
- **Platform modularity** demonstrated through CUE-102 for WT1 associated cancers
- **Neo-STAT capability** enhances manufacturability and R&D efficiency offering potential for personalized immunotherapy

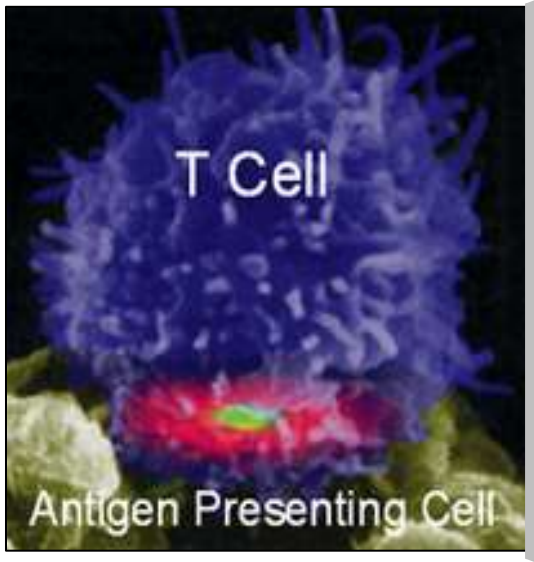
Strategic Partnerships to Accelerate Expansion

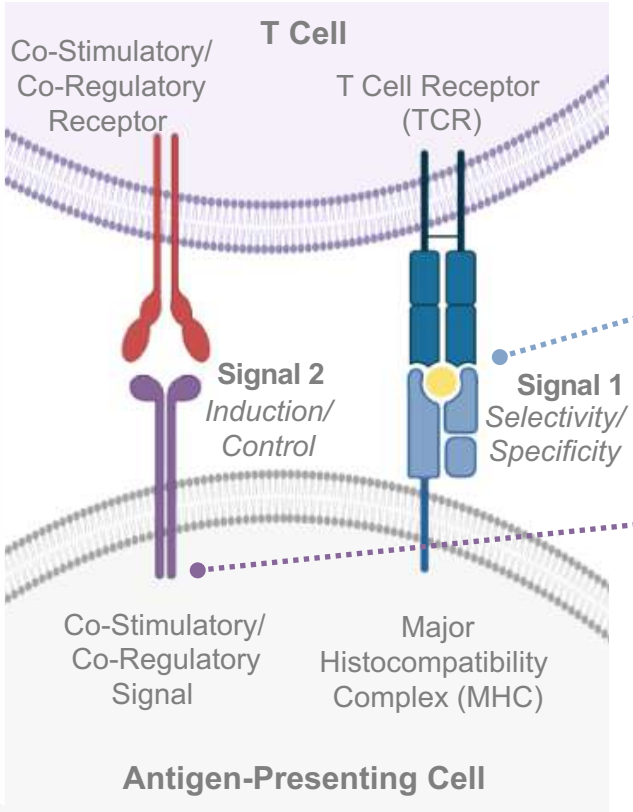
- **LG Chem collaboration** to expand IL-2 based CUE-100 series in immuno-oncology
- **Merck collaboration** to establish proof of mechanism for Immuno-STAT platform in autoimmune disease

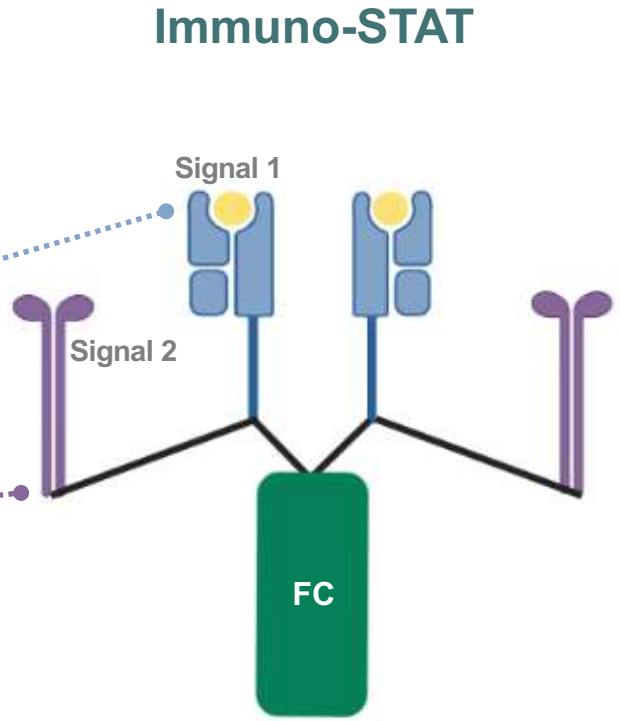
Strong financial position supports key readouts from ongoing CUE-101 clinical study and further expansion of Immuno-STAT platform

CUE™ BIOPHARMA

Emulating Nature's Cues to Selectively Modulate T Cells







Rationally engineered Immuno-STAT biologics selectively target and modulate the activity of disease-relevant T cells

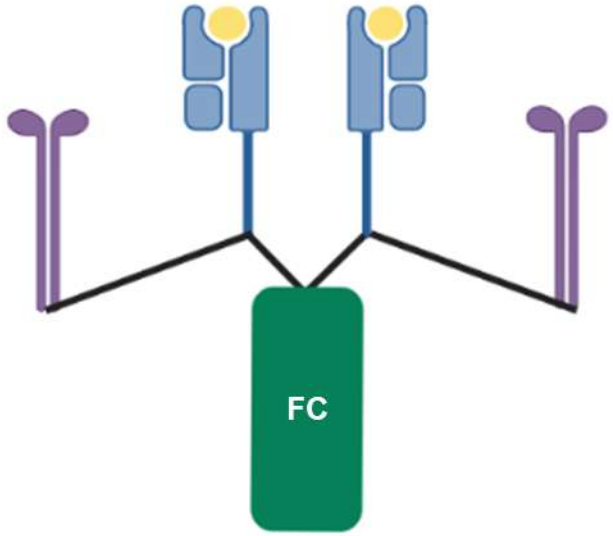
Immuno-STAT Modularity

MHC

Different HLA alleles to address global patient populations

Co-stim/Co-reg

Distinct biological signals, including cytokines and cell-surface receptors



Peptide

Peptide epitopes to target different diseases

Fc Backbone

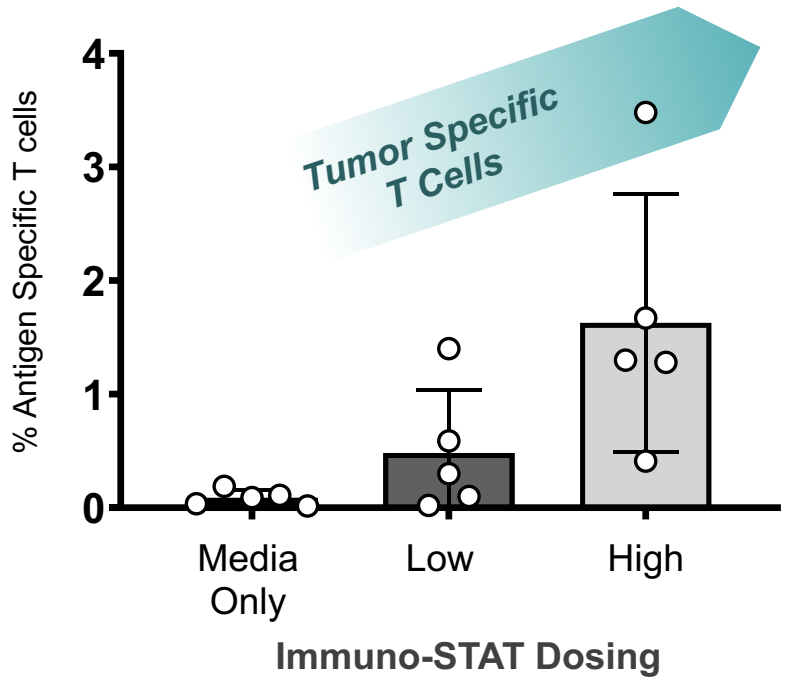
Fc engineering to dial in or dial out biological and effector functions

Combinatorial diversity presents potential to generate therapeutic molecules for a broad set of diseases and patient populations

Immuno-STATs Selectively Modulate Disease Relevant T Cells

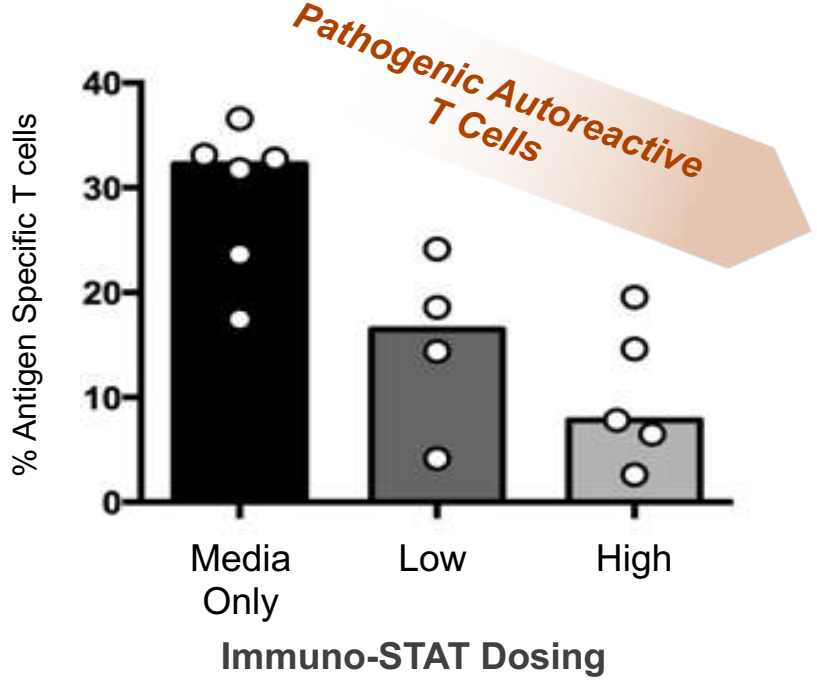
Oncology

MART1 and IL-2 in Human PBMCs



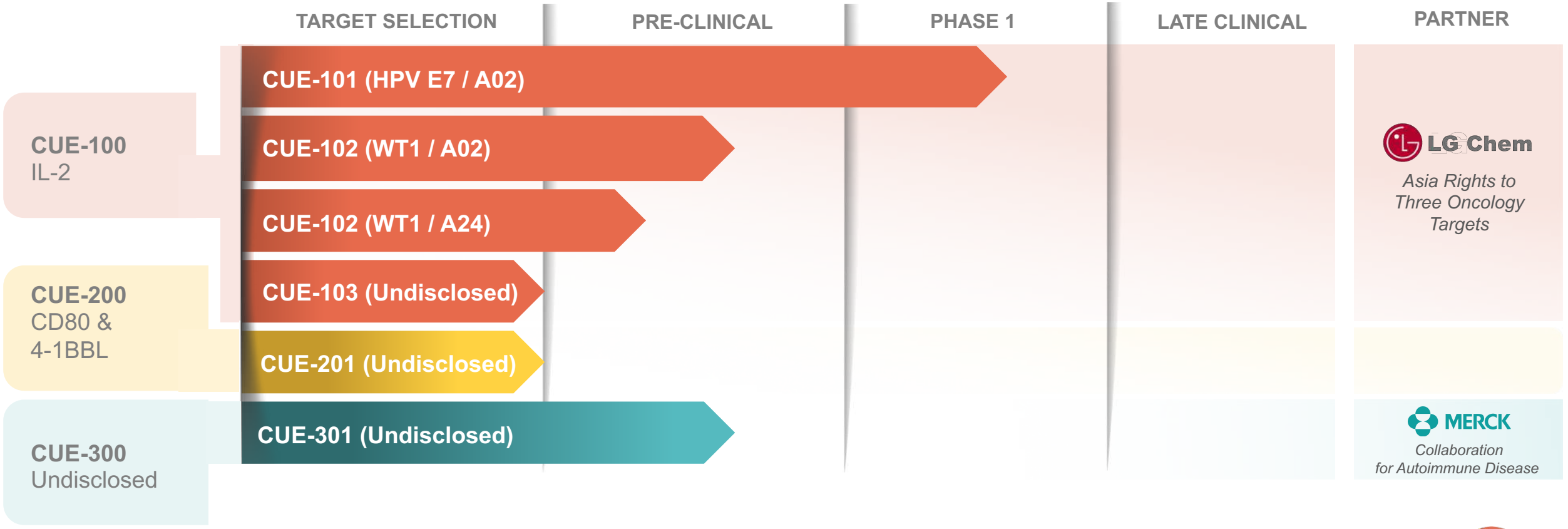
Autoimmune Disease

IGRP and PD-L1 in NOD Mice



Immuno-STAT design and formatting enables selective expansion or depletion of disease relevant T Cells

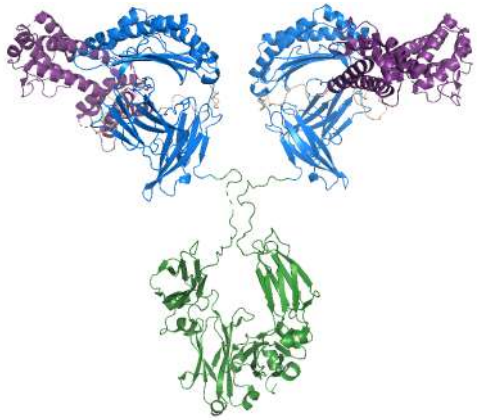
Pipeline



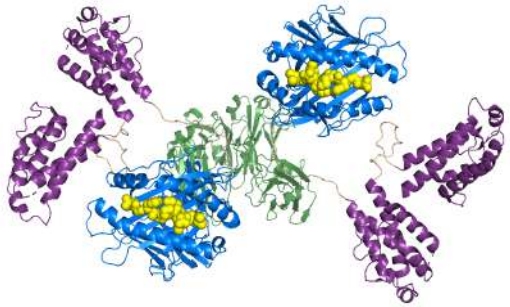
CUE-100 Series: Exploiting IL-2 via Rational Protein Design

CUE-100 Series

Side View



Top View



Immune Signaling Components

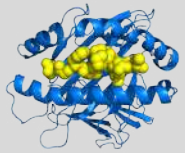
Attenuated IL-2

Optimized for desired biological activity through two single amino acid changes

- Abrogates binding to IL-2R alpha
- Reduces binding affinity to IL-2R beta

Maintains IL-2 ability to stimulate antigen-specific CD8+ T cells while reduced Treg expansion

Peptide Loaded HLA



Stabilized peptide HLA complex to present disease-relevant epitope to T cell receptor

- Framework allows for incorporation of an array of HLA Class I alleles (i.e., A02, A11, A24)

Provides "Signal 1" to the targeted antigen-specific CD8+ T cells, thereby enhancing the activity of the attenuated IL-2

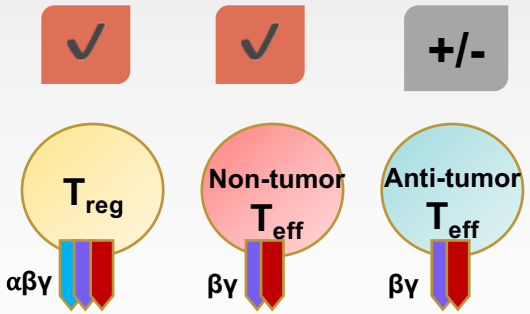
Therapeutic framework is not dependent on barriers of antigen processing & presentation, and is designed to avoid systemic immune activation

CUE™ BIOPHARMA

CUE-100 Series: Mechanistic Differentiation Over Emerging "Not Alpha" IL-2 Landscape

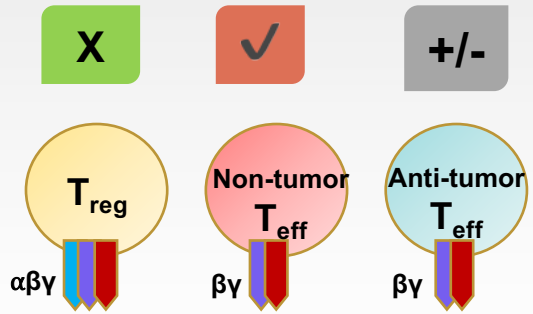
IL-2Rα
IL-2Rβ
IL-2Rγ

Wild Type IL-2 *(e.g., Proleukin)*



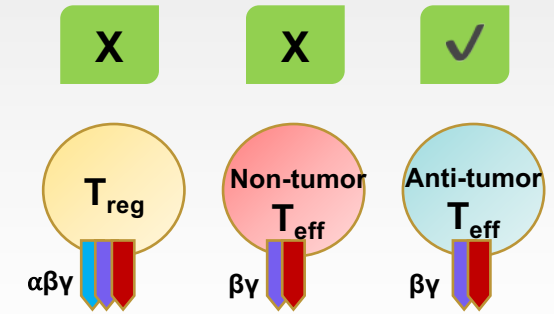
- Expansion of Tregs
- Expansion of non-tumor Teffs
- Expansion of tumor-specific T cells, if pre-existing

"Not Alpha" IL-2 *(e.g., THOR-707)*



- **No expansion of Tregs**
- Expansion of non-tumor Teffs
- Expansion of tumor-specific T cells, if pre-existing

CUE-100 IL-2 Series *(e.g., CUE-101)*



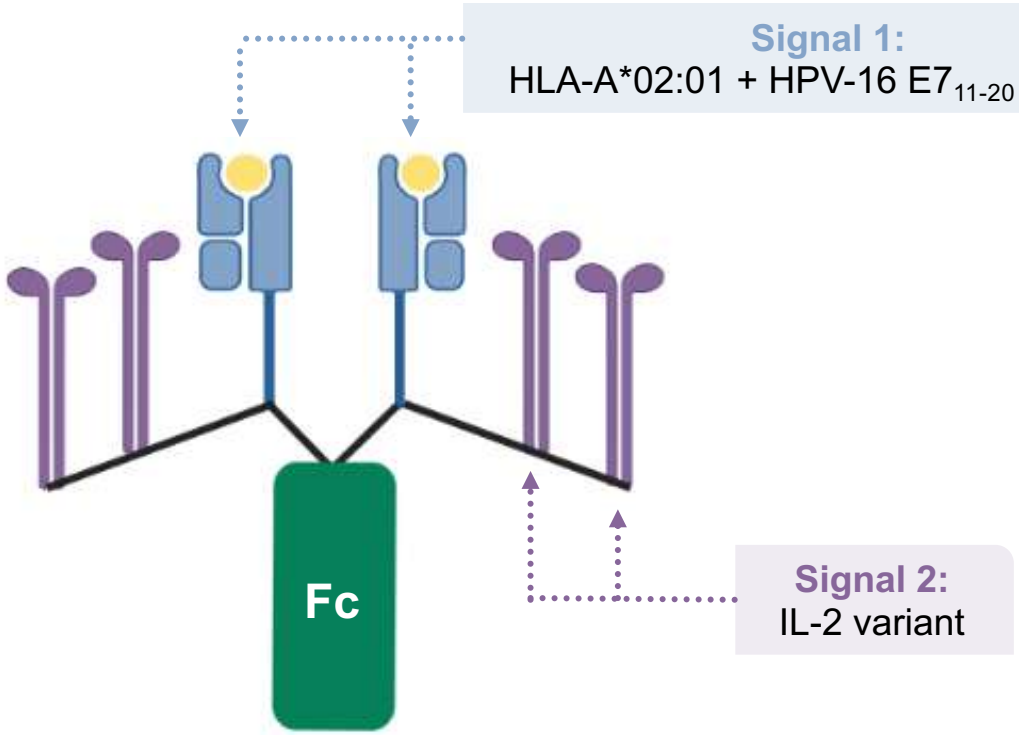
- **No expansion of Tregs**
- **Minimal expansion of non-tumor Teffs**
- **Induction and expansion of tumor-specific T cells**

CUE-100 series is designed for selective induction and expansion of tumor-specific CD8+s without reliance on a pre-existing repertoire

CUE BIOPHARMA

CUE-101: Lead Clinical Candidate for HPV-Driven Malignancies

CUE-101 Immuno-STAT Design

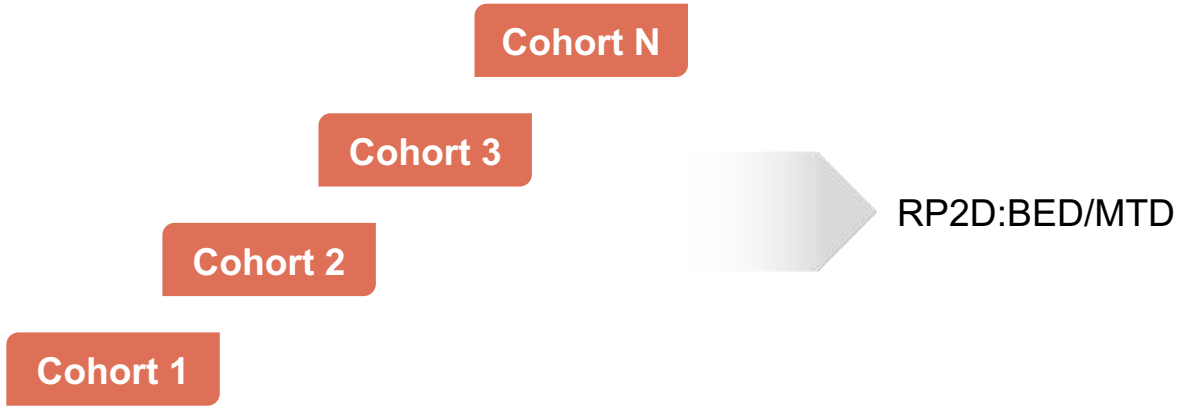


Clinical Rationale

- HPV+ head and neck cancer is a significant issue in western markets, with reported 2.5% annual growth in incidence
- Despite treatment with current standards of care, more than 50% of patients with advanced disease will experience recurrence and experience significant quality of life impact
- CUE-101 is designed to selectively activate and expand HPV-specific T cells in vivo, while bypassing global activation of the immune system thereby avoiding safety concerns
- CUE-101 clinical development plan builds upon robust translational preclinical data and rational patient stratification strategy

CUE-101: Ongoing First-In-Human Study

Part A: Monotherapy Dose Escalation



Part B: Monotherapy Dose Expansion

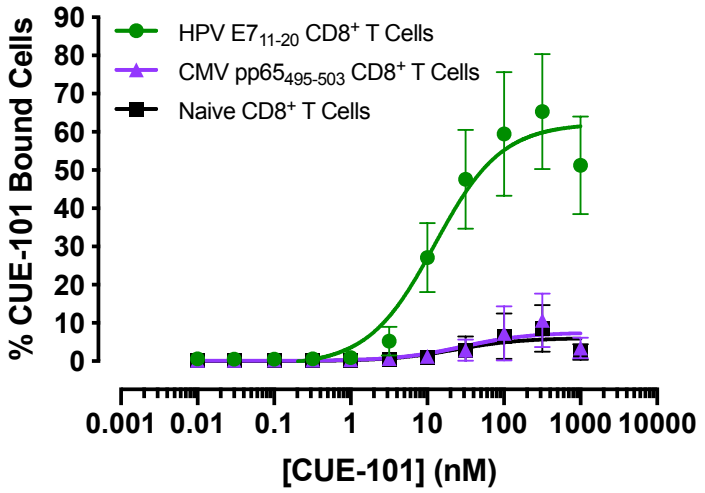
Late Line Accelerated Approval Opportunity in H&N

Potential for Other Tumor Cohorts and PD-1 Combination

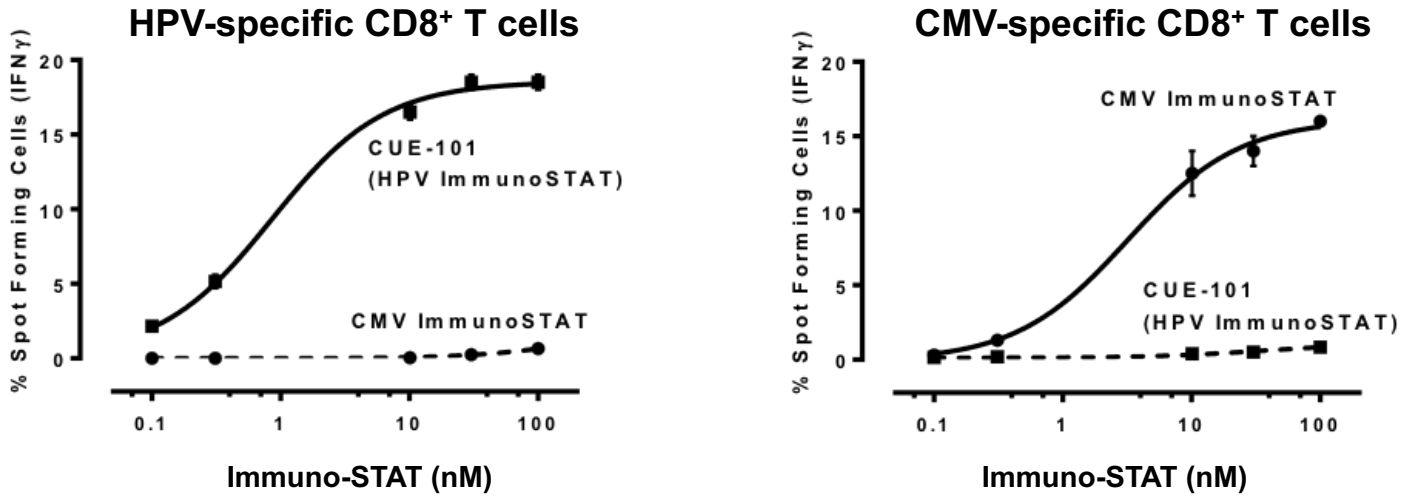
- **Design** (CUE-101 Q3W)
  - Part A: Dose Escalation (3+3)
  - Part A: Safety Expansion (Up to 9 Patients)
  - Part B: Dose Expansion (10-20 Pts at RP2D)
- **Eligibility**
  - Part A & B: HPV+ H&N Cancer, R/M 2L+
- **Objectives**
  - Primary: Safety and Tolerability
  - Secondary: PK/PD, Anti-Tumor Activity
- **Biomarkers** (Pre/Post CUE-101 Dose)
  - HPV E7-specifc CD8+ T cell counts
  - HPV E7-specific CD8+ T cell functionality
  - Immunophenotyping, cytokine release, and TCR sequencing

CUE-101: Directing IL-2 to the "Right" T Cells

Selective Binding

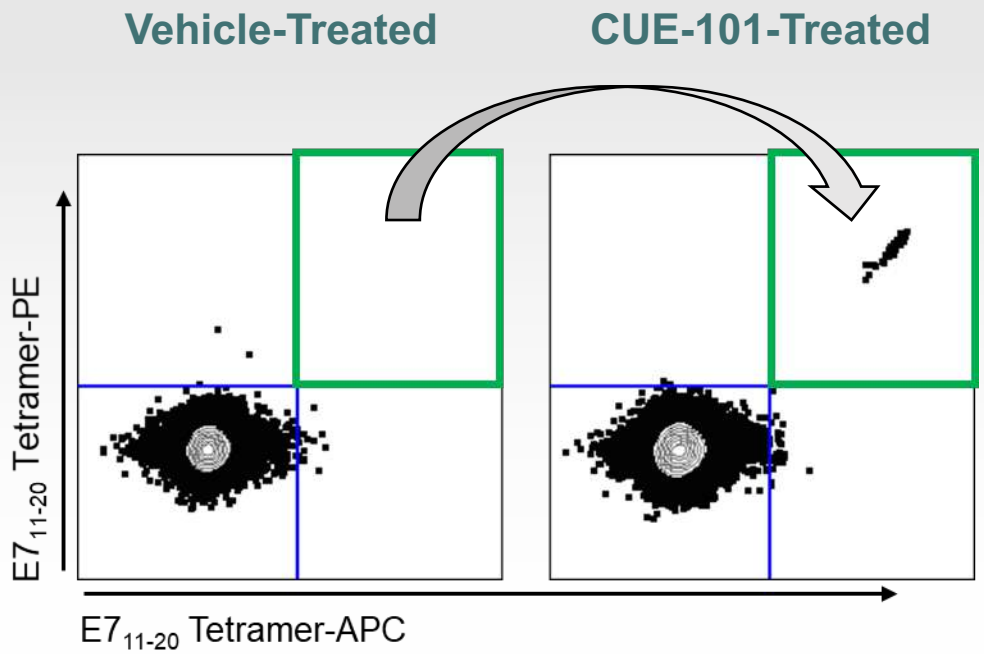


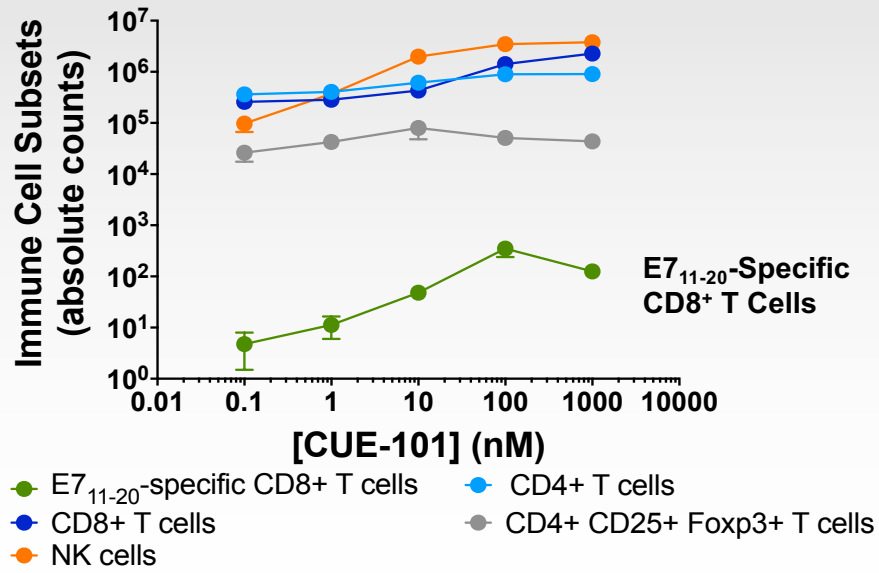
Intact & Selective Effector Function



CUE-101 specifically targets and activates HPV-E7 T cells

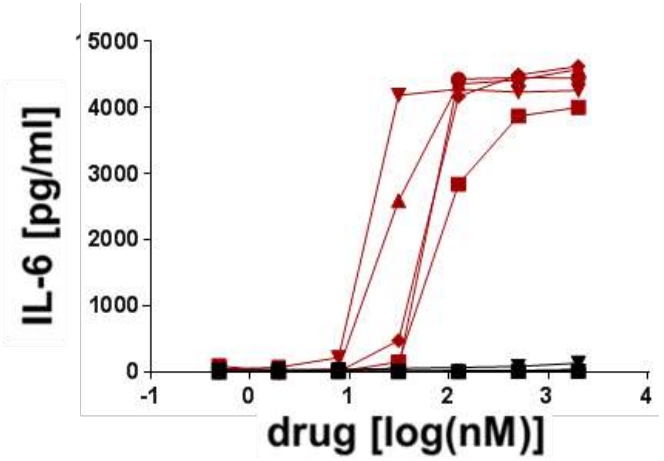
CUE-101: *In Vitro* Expansion of E7-Specific T Cells

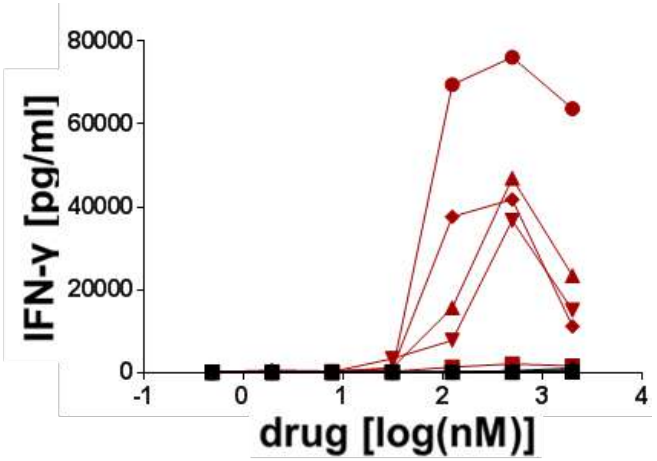


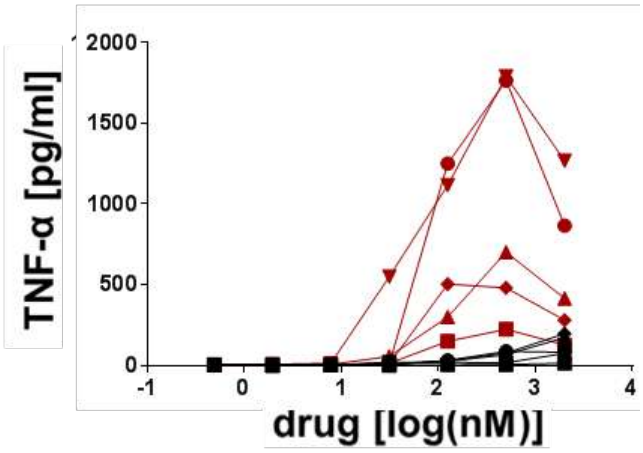


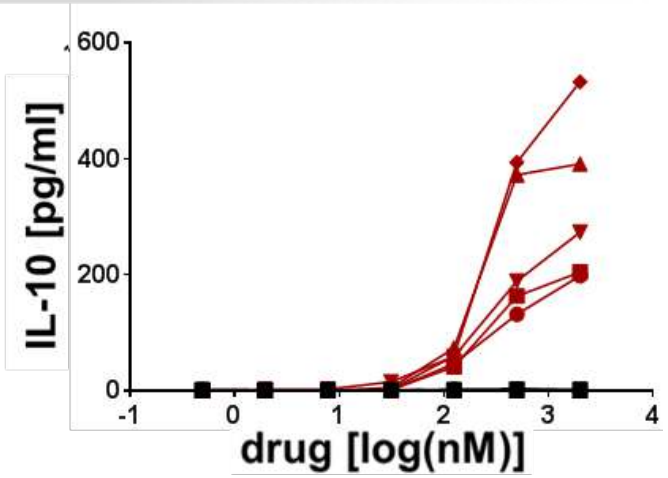
CUE-101 selectively expands HPV-E7 T cells with minimal effects on regulatory T cells

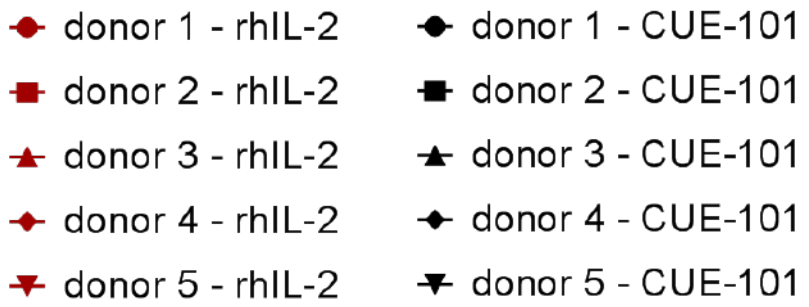
CUE-101 vs Wild-Type IL-2: Mitigating the Risk Associated with Systemic IL-2 Activation







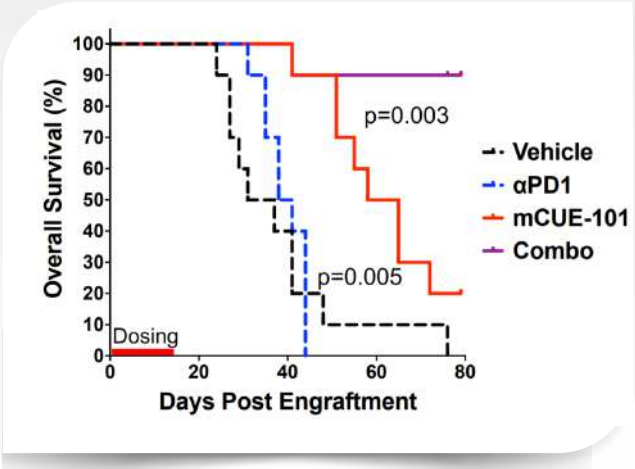




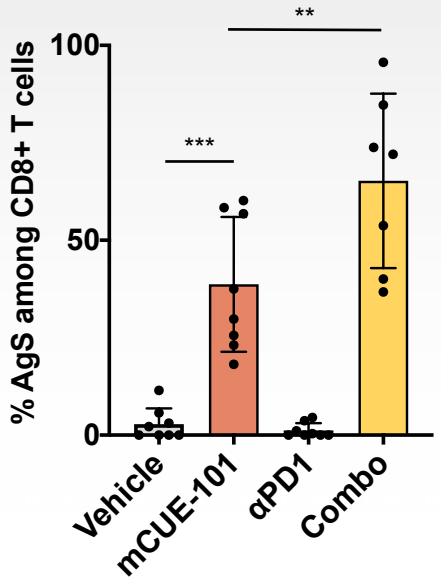
- PBMC from healthy human donors were stimulated for 18 hours with increasing amounts of CUE-101 or recombinant human IL-2
- Cytokine production was assessed in culture supernatant by MSD

CUE-101 Surrogate: Activity in an *In Vivo* Preclinical Model

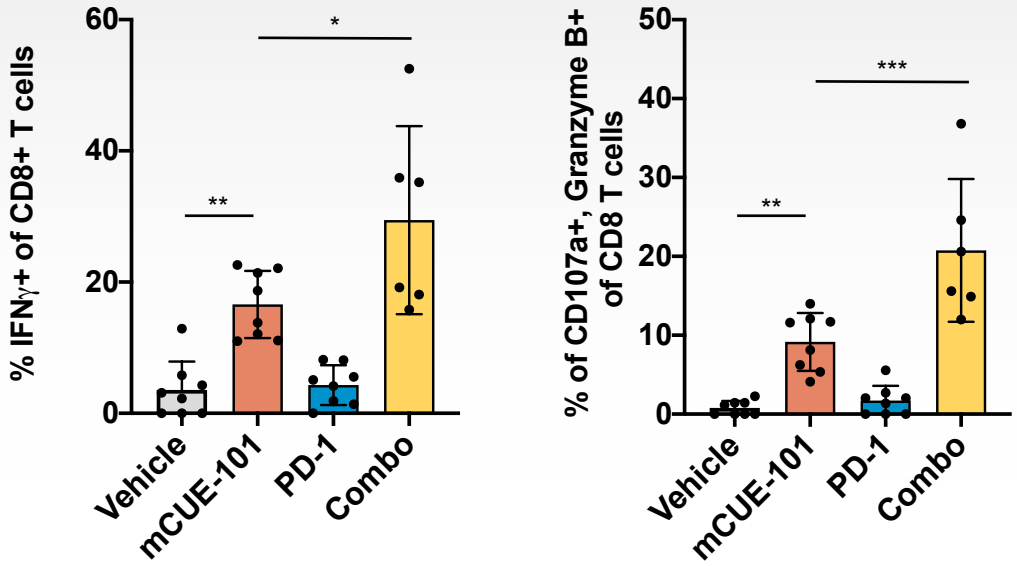
TC1 Tumor Model: Improved Survival (mono vs combo w/ anti-PD-1)



Specific T Cell Expansion in Tumors



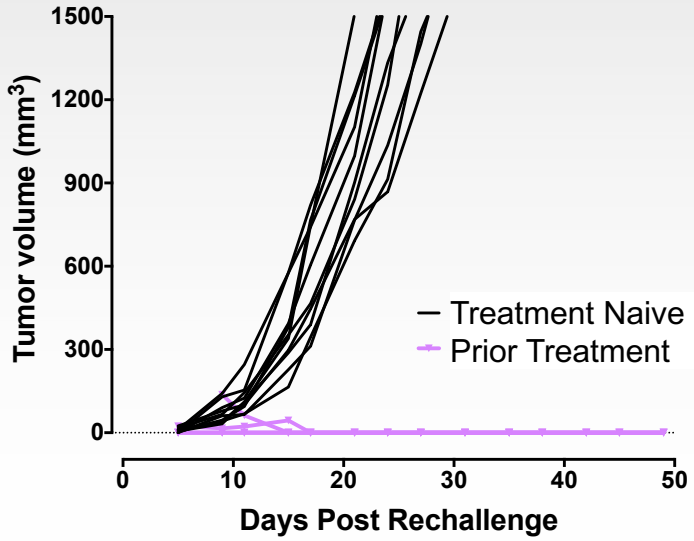
Antigen-Specific TILs are Cytolytic



CUE-101 shows improved survival through expansion of functional, tumor-specific T cells

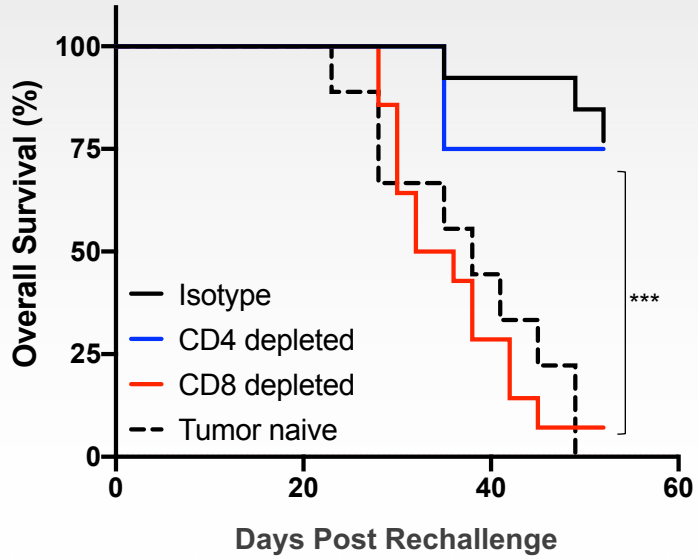
CUE-101 Surrogate: Activity in an *In Vivo* Preclinical Model

Induction of Long Term Memory



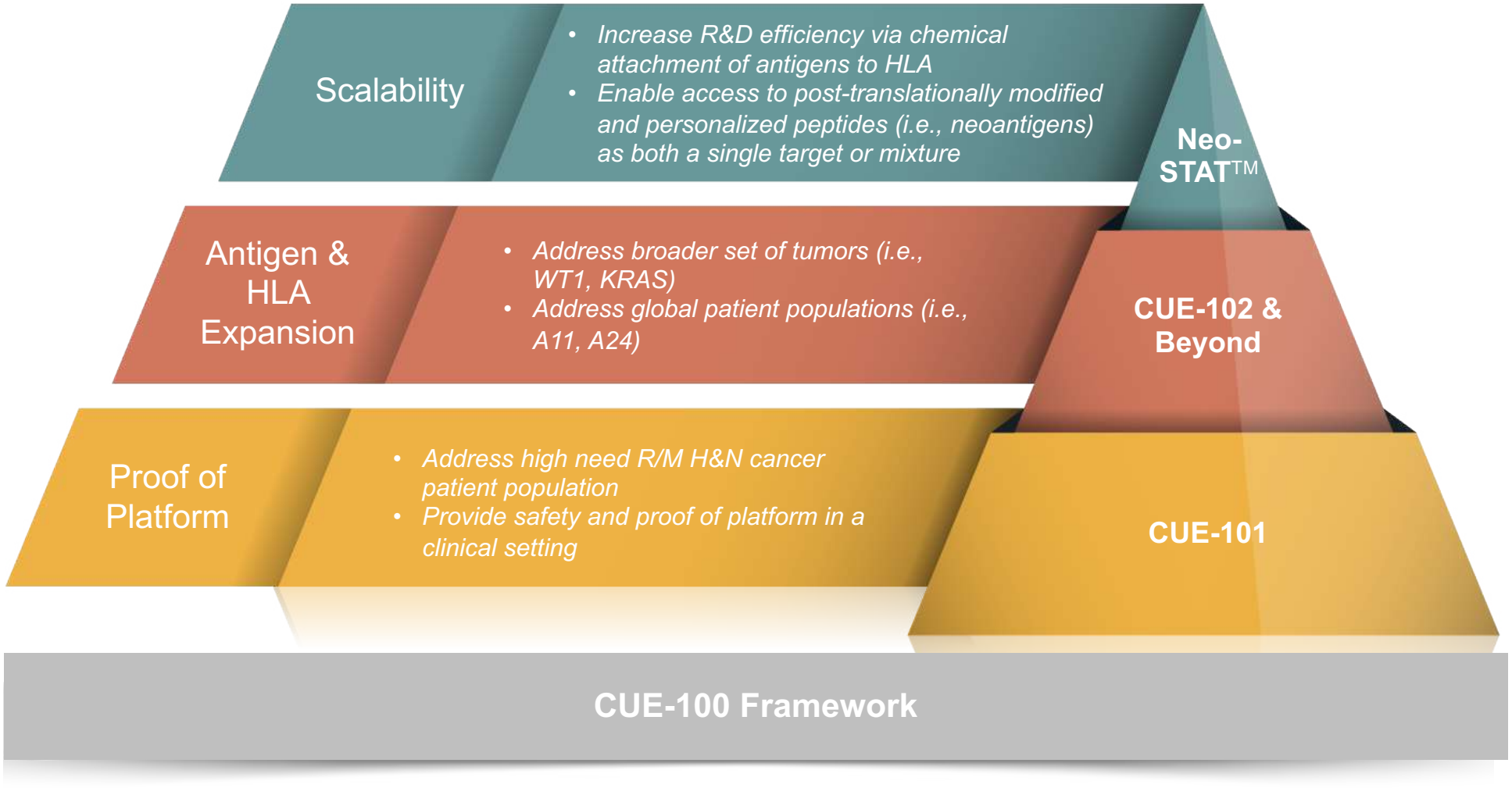
Re-challenge of long-term protected mice at post d80 in absence of additional treatment

Memory Dependent Upon CD8+ T cells

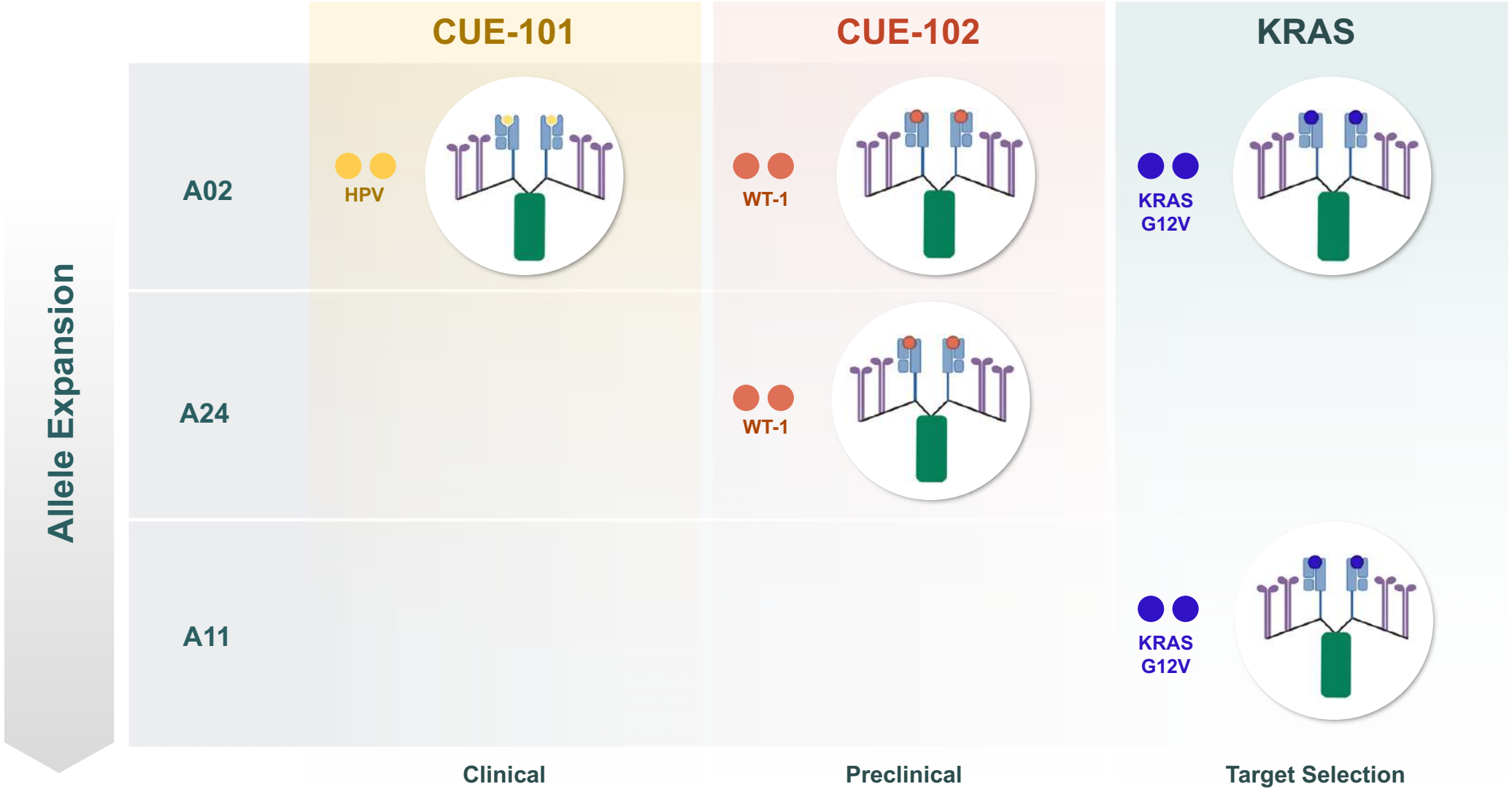


Induction of long-term memory is CD8-dependent, both as a monotherapy and in combination with anti-PD-1

Building Blocks of IO Growth Strategy

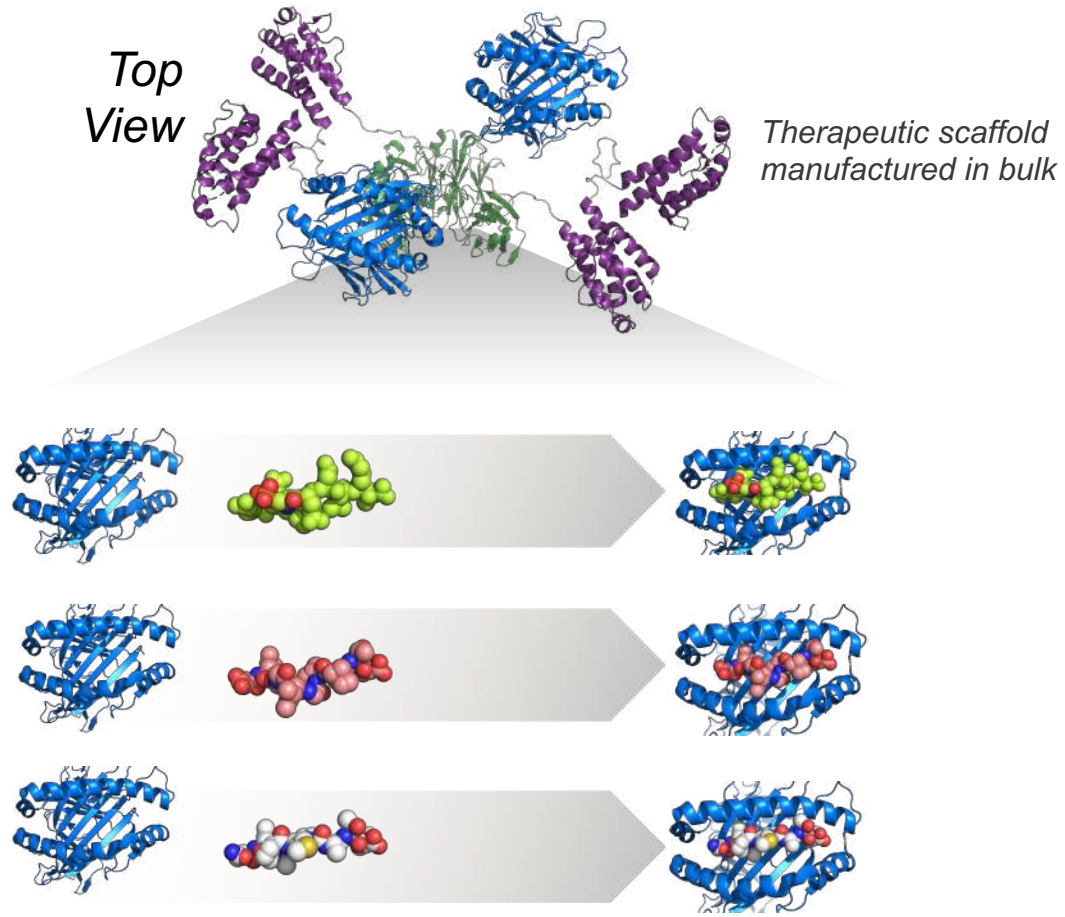


CUE-100 Series Extensibility: CUE-102 and KRAS



Neo-STAT: Next-gen Evolution of the Immuno-STAT Framework

CUE-100 Neo-STAT



Therapeutic scaffold receptive for chemical conjugation of peptides, that potentially:

- **Increases R&D efficiency** and reduces cost of the generation of clinical grade material on the CUE-100 framework
- **Enables access to post-translationally** modified peptides and targeting of multiple peptides/neo-antigens for personalized therapy

Corporate Highlights

Disruptive Platform for T Cell Modulation *In Vivo*

- **Distinct mechanism of action** for the selective and specific modulation of disease relevant T cells
- **Modular therapeutic frameworks** enable potential to address a broad range of cancers and autoimmune diseases
- **Injectable biologics engineered** for production through industry-standard manufacturing, without the need for ex vivo manipulation

Focused Execution Against Platform Validation

- **CUE-101 in Phase 1** for recurrent/ metastatic HPV+ head and neck cancer with initial translational readout expected 1H 2020
- **Platform modularity** demonstrated through CUE-102 for WT1 associated cancers
- **Neo-STAT capability** enhances manufacturability and R&D efficiency offering potential for personalized immunotherapy

Strategic Partnerships to Accelerate Expansion

- **LG Chem collaboration** to expand IL-2 based CUE-100 series in immuno-oncology
- **Merck collaboration** to establish proof of mechanism for Immuno-STAT platform in autoimmune disease

Strong financial position supports key readouts from ongoing CUE-101 clinical study and further expansion of Immuno-STAT platform

CUE BIOPHARMA