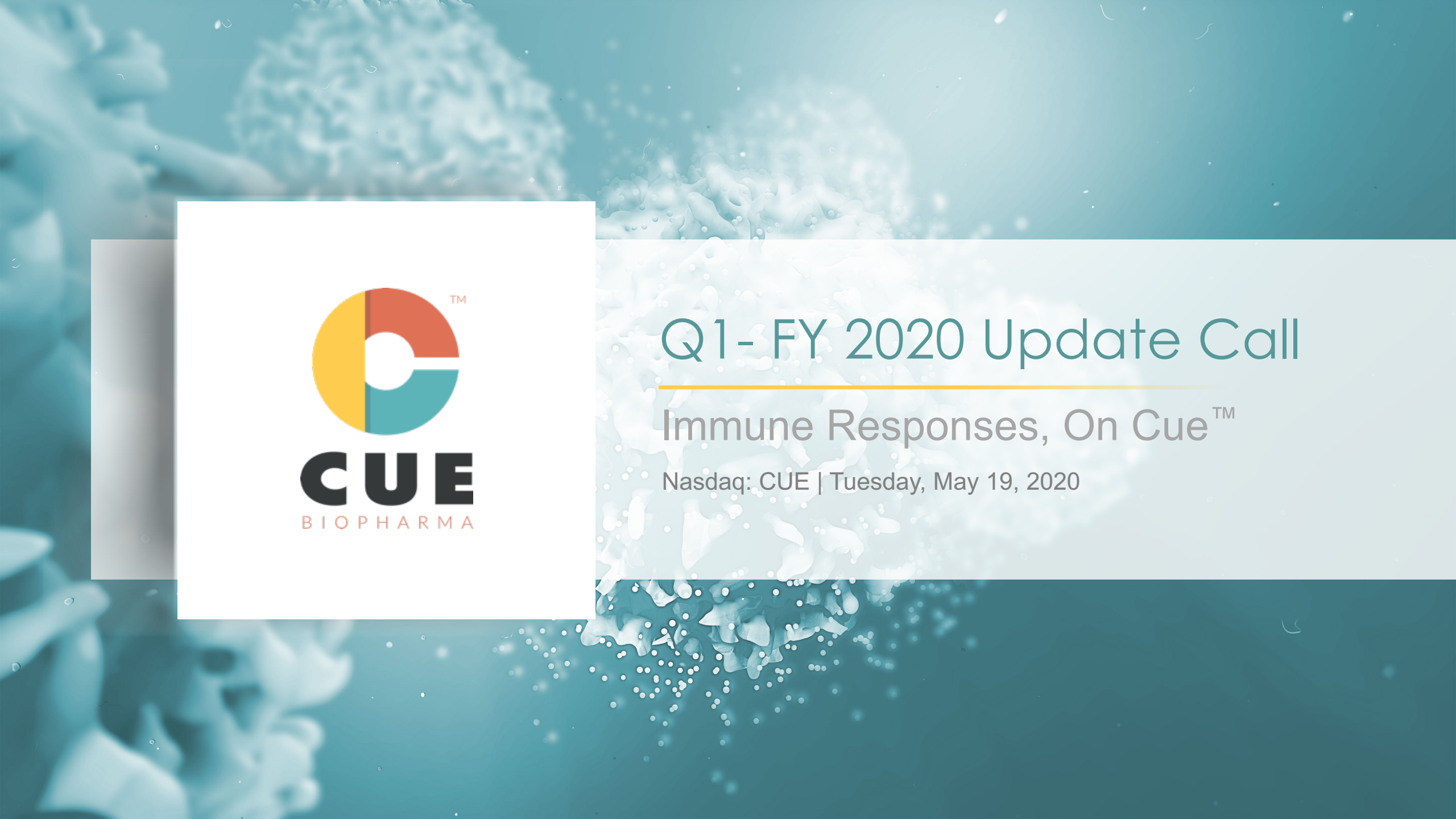

Q1- FY 2020 Update Call

Immune Responses, On Cue™

Nasdaq: CUE | Tuesday, May 19, 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 third parties to conduct our clinical trails as well as licensors, collaborations and strategic alliances; our ability to obtain adequate financing to fund our business operations in the future; uncertainties associated with COVID-19 or coronavirus, including its possible effects on our operations and clinical trial; 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.

Agenda

Introduction and Q1 Highlights	Dan Passeri, CEO
CUE-101 Clinical Update	Dr. Ken Pienta, Acting CMO
Pipeline and Platform Progress	Dr. Anish Suri, President and CSO
Financials	Kerri-Ann Millar, VP Finance
Concluding Remarks	Dan Passeri
Q&A	All

Overview of Progress in Q1

Validate

- Data from first four CUE-101 patient cohorts demonstrates favorable characteristics and drug properties, including safety, tolerability and dose proportional PK that aligns with projections
- Growing evidence supporting that the CUE-101 appears to be “clinically active”
- Recent announcement of collaboration with Merck to study CUE-101 with anti-PD-1 combination in H&N front line setting

Expand

- Presentation of data from CUE-102 demonstrating ex vivo expansion of WT-1-specific human T cells, polyfunctionality and their killing of target cells at NYAS Frontiers in Cancer Immunotherapy
- PoC data supporting feasibility of Immuno-STATs to target KRAS-mutant cancers
- Continue to expand Immuno-STAT applications in autoimmune diseases via Merck collaboration focused on two indications; and early assessments and interest in additional indications

Accelerate

- Generation of early proof of concept data supporting the biological activity of molecules generated via the Neo-STAT platform
- Opportunity to rapidly expand the IL-2-based CUE-100 series using the Neo-STAT platform

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CUE-101: Phase 1 Clinical Development Network

- **Emory Winship Cancer Institute**: Nabil Saba
- **Karmanos Cancer Institute**: Elizabeth Heath and Ammar Sukari
- **MD Anderson Cancer Center**: Bonnie Glisson
- **MGH/Harvard and Dana Farber Cancer Institute**: Sara Pai and Lori Wirth
- **Moffitt Cancer Center**: Christine Chung
- **Memorial Sloan Kettering Cancer Center**: Lara Dunn
- **Stanford Cancer Center:** A. Dimitrios Colevas
- **University of Arizona Center:** Julie Bauman
- **University of Michigan Rogel Cancer Center:** Frank Worden
- **University of Washington Fred Hutch Cancer Center**: Cristina Rodriguez
- **Vanderbilt-Ingram Cancer Center**: Jill Gilbert and Mike Gibson
- **Washington University Siteman Cancer Center**: Doug Adkins
- **Yale Cancer Center**: Barbara Burtness

Cue Biopharma has engaged a network of nationally recognized clinical investigators and 13 Phase 1 sites are now open

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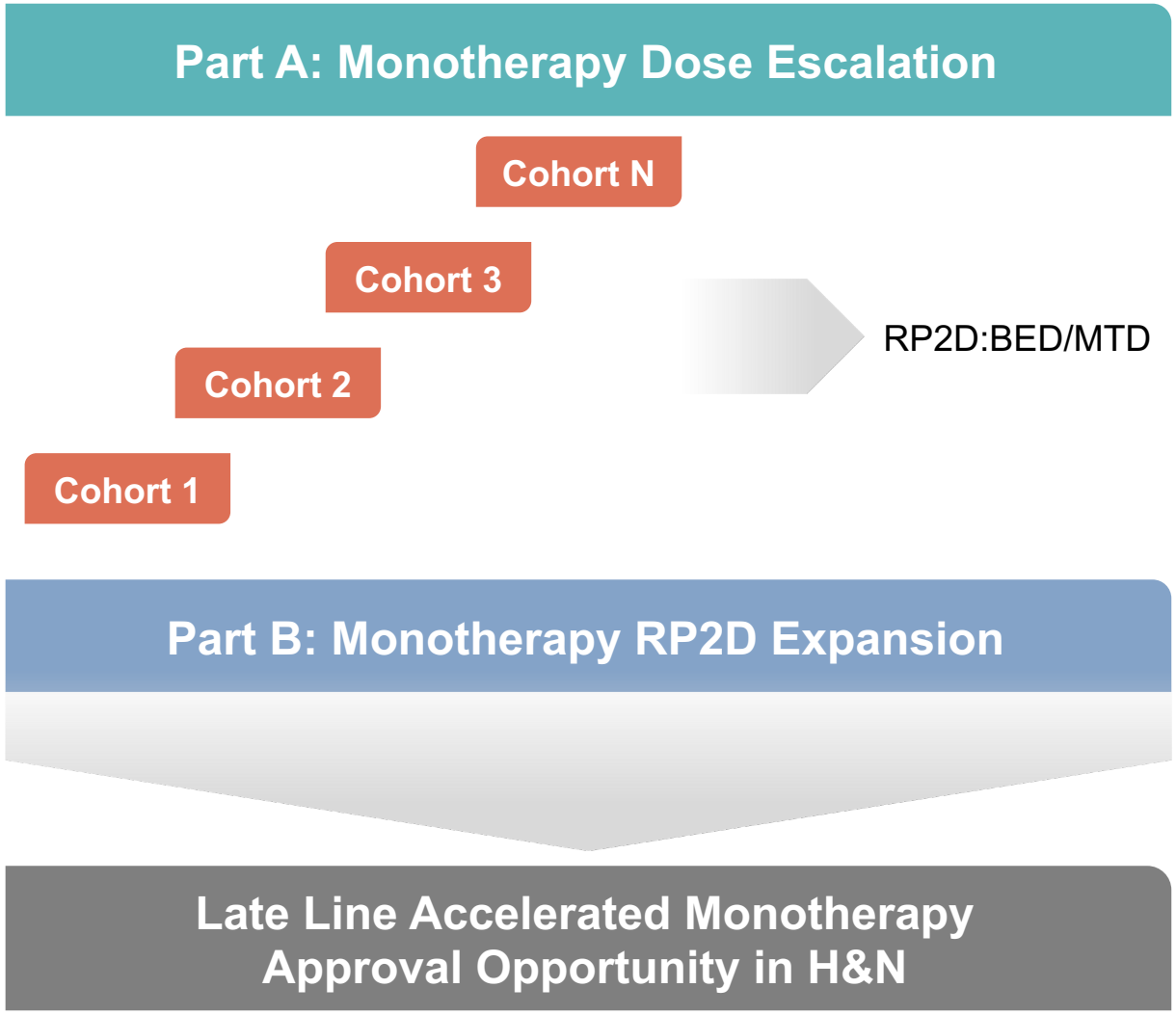
CUE-101: Ongoing First-In-Human Study



- **Eligibility**
  - Part A & B: HPV+ H&N Cancer, R/M 2L+
- **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)
- **Objectives**
  - Primary: Safety and Tolerability
  - Secondary: PK/PD, Anti-Tumor Activity
- **Biomarkers** (Pre/Post CUE-101 Dose)
  - HPV E7-specific CD8+ T cell counts
  - HPV E7-specific CD8+ T cell functionality
  - Immunophenotyping, cytokine release, and TCR sequencing

CUE-101: Phase 1 Dose Cohorts

Cohort	CUE-101 Dose	CUE-101 Dose relative to approved Proleukin dose (0.037 mg/kg)	CUE-101 IL-2 content (nmol/kg)	CUE-101 IL-2 content relative to the approved Proleukin dose (2.4 nmol/kg)
Cohort 1 ✓	0.06 mg/kg (starting dose)	~ 1.6x	1.1	~ 0.46x
Cohort 2 ✓	0.18 mg/kg	~ 4.9x	3.4	~ 1.4x
Cohort 3 ✓	0.54 mg/kg	~ 14.6x	10.3	~ 4.3x
Cohort 4 ✓	1 mg/kg	~ 27.0x	19.1	~ 8.0x
Cohort 5	2 mg/kg	~ 54.0x	38.2	~ 16.0x
Cohort 6	4 mg/kg	~ 108.0x	76.4	~ 32.0x
Cohort 7	8 mg/kg	~ 216.0x	152.9	~ 64.0x

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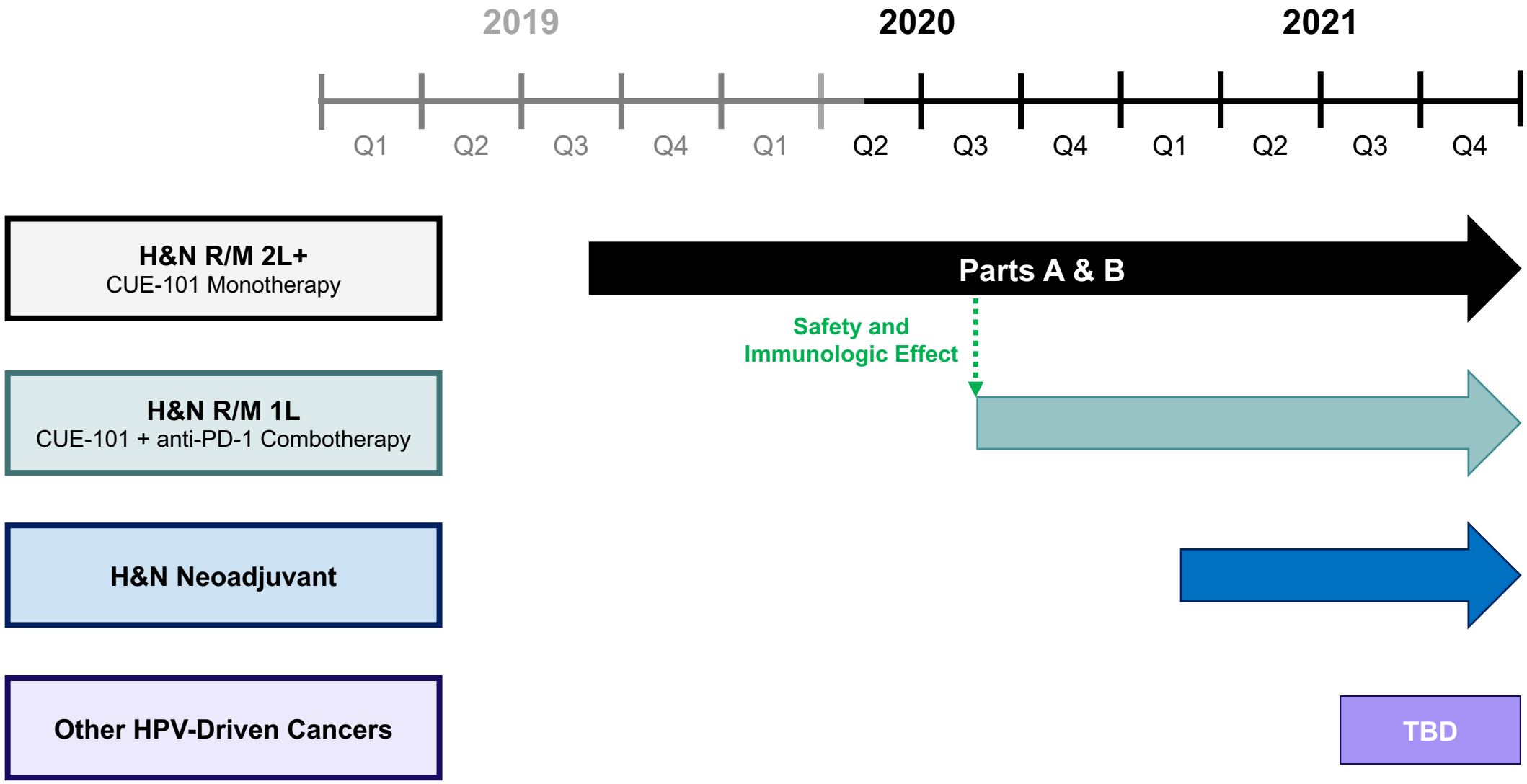
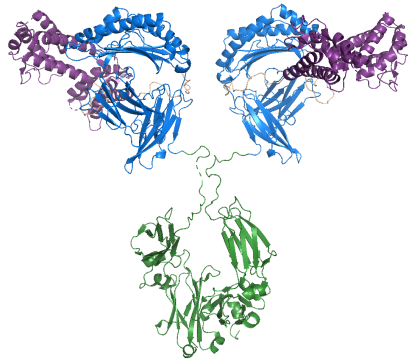
CUE-101: Clinical Development Plan



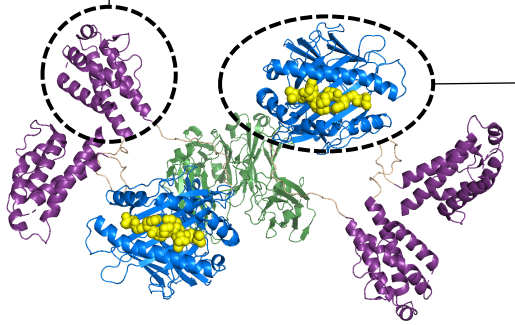
CUE-100 Series: Exploiting IL-2 via Rational Protein Design

CUE-100 Series

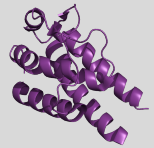
Side View



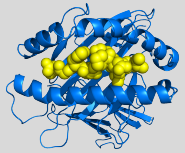
Top View



Attenuated IL-2



Peptide Loaded HLA



Immune Signaling Components

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 reducing Treg expansion

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

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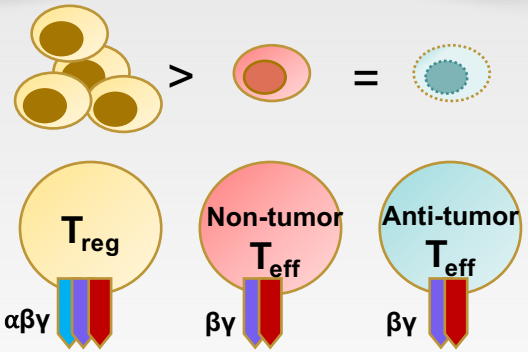
CUE-100 Series: Mechanistic Differentiation Over Emerging "Not Alpha" IL-2 Landscape

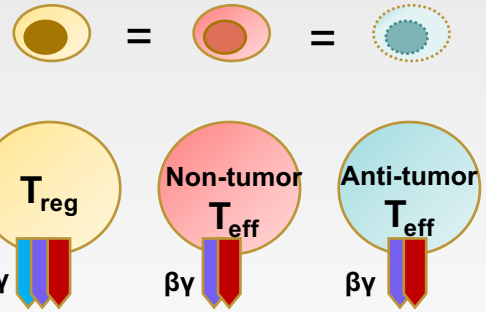
IL-2Rα
IL-2Rβ
IL-2Rγ

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



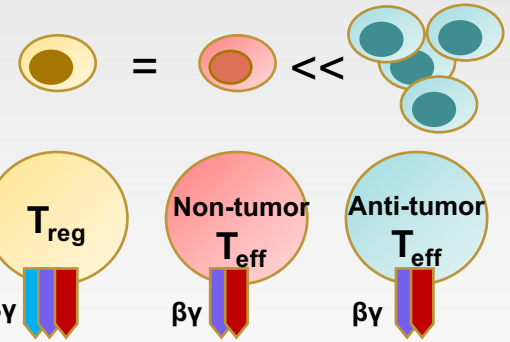
- Expansion of Tregs
- Expansion of non-tumor Teffs
- Expansion of tumor-specific T cells, if pre-existing

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



- **Reduced 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)*



- **Reduced expansion of Tregs**
- **Reduced expansion of non-tumor Teffs**
- **Expansion of pre-existing tumor-specific T cells and priming of naïve T cells**

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

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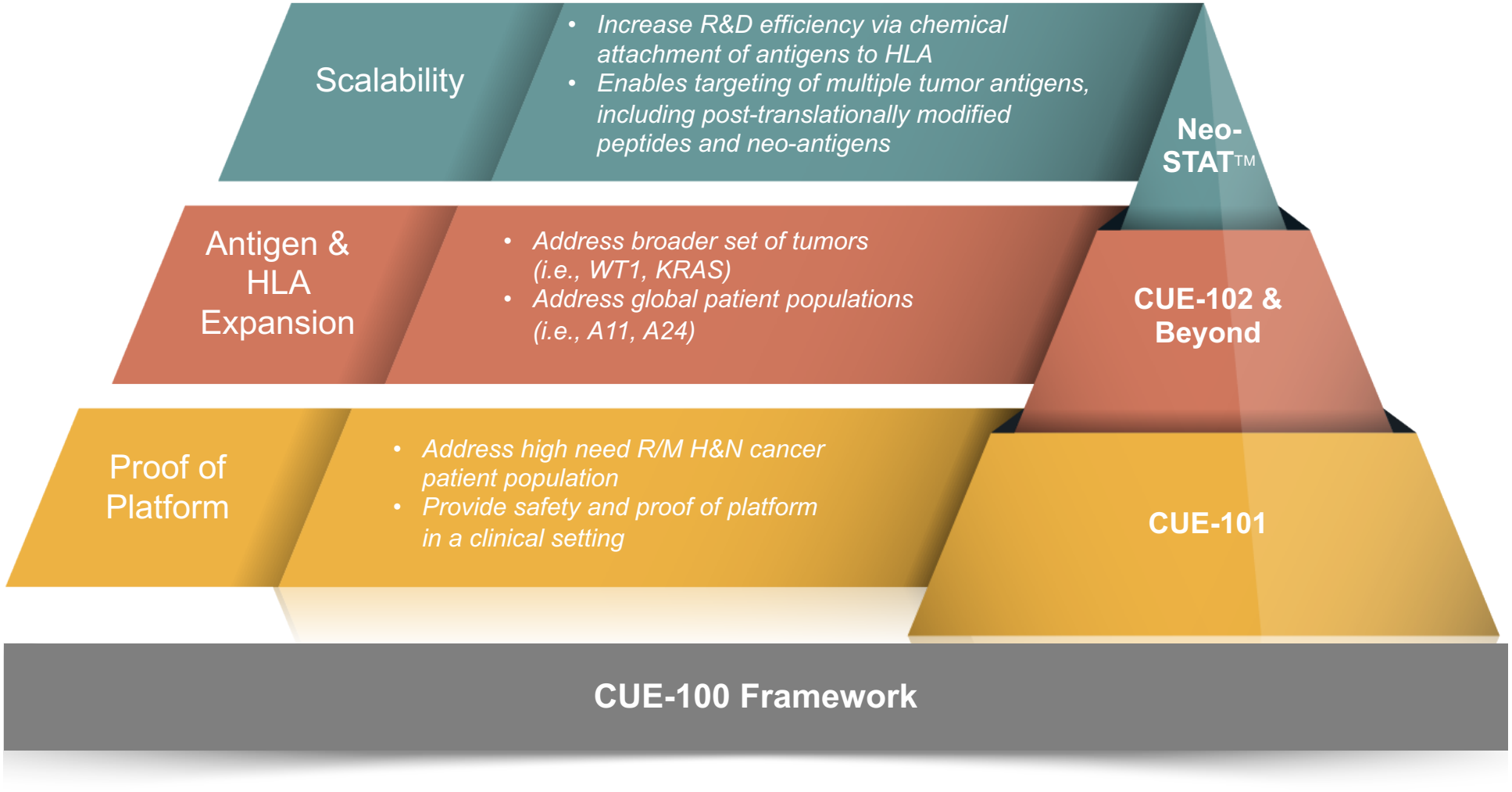
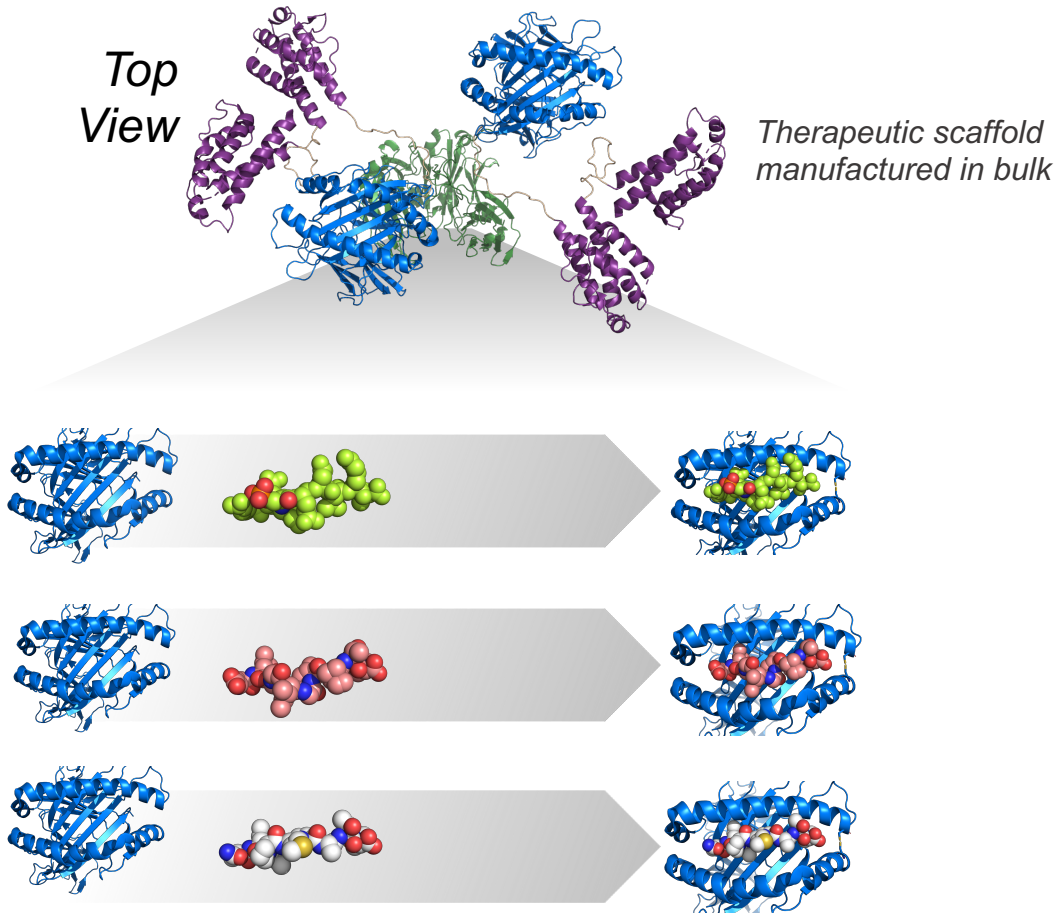
Building Blocks of IO Growth Strategy



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

CUE-100 Neo-STAT

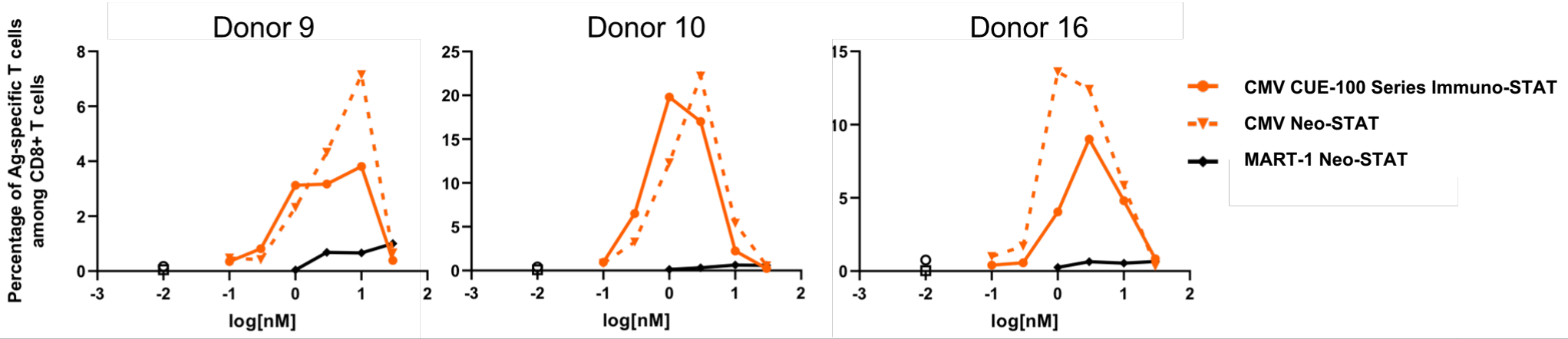


Therapeutic scaffold receptive for chemical conjugation of peptides, that potentially:

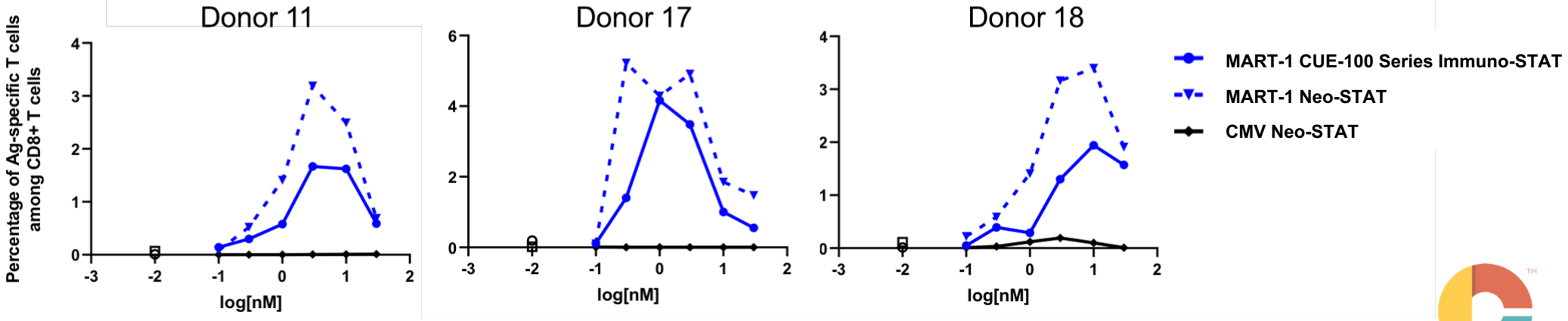
- **Increases R&D efficiency** and reduces cost of the generation of clinical grade material on the CUE-100 framework
- **Enables targeting of multiple tumor antigens** including post-translationally modified peptides and neo-antigens for personalized therapy

Primary Human T Cell Expansion: Neo-STAT = Immuno-STAT

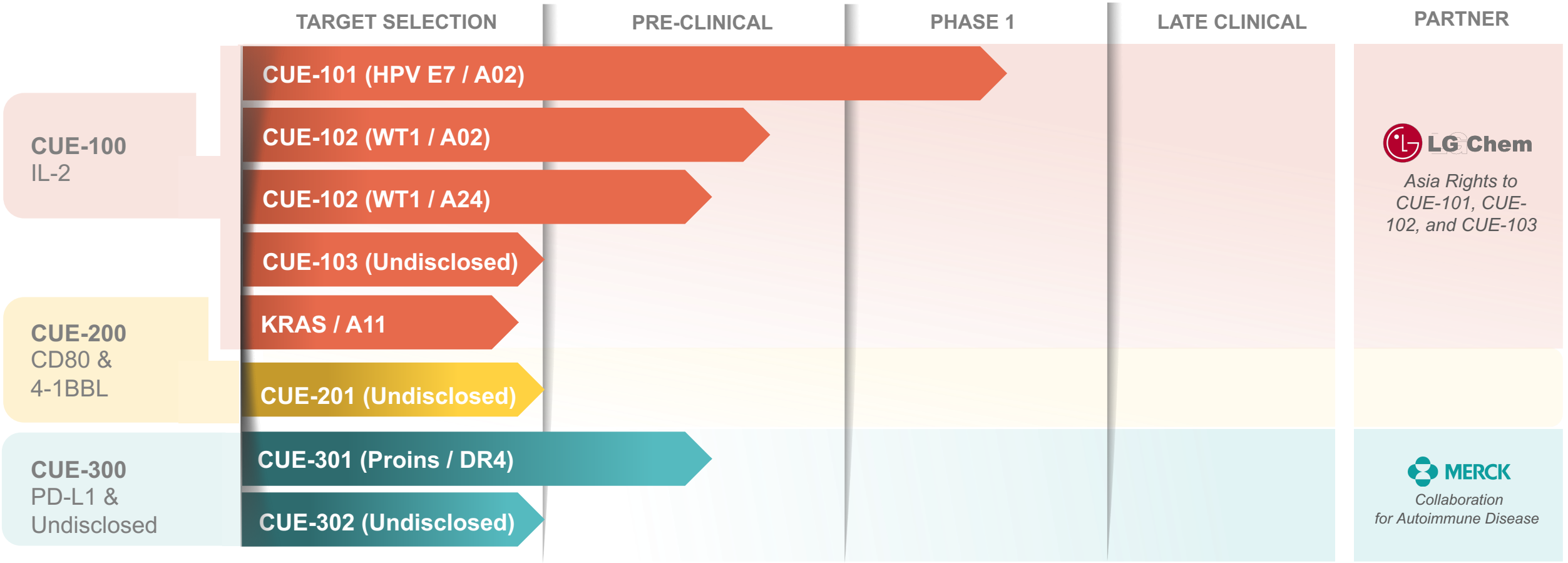
CMV Responsive Donors



MART-1 Responsive Donors



Pipeline



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Balance Sheet and Statement of Operations Summary

(in thousands)	As of March 31, 2020	As of December 31, 2019
Cash and Cash Equivalents	$23,432	$44,290
Marketable Securities	$25,298	$15,120
Total Current Assets	$51,190	$61,025
Working Capital	$39,100	$49,370

(in thousands)	Q1 2020	Q1 2019
Collaboration revenue	**$900**	**$370**
General & Administrative	$3,989	$3,444
Research & Development	$9,906	$8,353
Total Operating Expenses	**$13,895**	**$11,797**

Our current cash position is estimated to take us into the fourth quarter of 2021

Key 2020 Milestones

1. PK/PD results from the Phase 1 CUE-101 clinical trial in **2Q20**
2. Clinical responses in Phase 1 CUE-101 via RECIST criteria in **2H20**
3. Initiate CUE-101 combination trial with Keytruda in 1L SCCHN in **2H20**
4. Initiate and extend IND-enabling activities for CUE-102 in **2H20**
5. Select target for CUE-103 in **2Q20**
6. Demonstrate Neo-STAT manufacturability and efficiencies in **2H20**
7. Identify potential clinical candidates in autoimmune collaboration with Merck in **2H20**

Key objectives met in 2019 and early 2020 have set the stage for data flow from multiple programs in the remainder of 2020

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