ASCO Investor Event

June 5, 2022

Forward-Looking Statements

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 based on our management's beliefs and assumptions and on information currently available to our management. All statements other than statements of historical facts contained in this presentation, including statements regarding our future financial condition, results of operations, business strategy, operations and prospects, the potential of and expectations regarding our product candidates and programs, and the plans and objectives of management, as well as statements regarding industry trends, are forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as "anticipate," "believe," "can," "contemplate," "continue," "could," "design," "estimate," "expect," "imagine," "intend," "likely," "may," "might," "objective," "ongoing," "plan," "potential," "predict," "project," "should," "target," "will" or "would," or the negative of these terms or other similar expressions or other comparable terminology are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

We have based these forward-looking statements largely on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, business strategy and financial needs, and these statements represent our views as of the date of this presentation. We may not actually achieve the plans, intentions or expectations disclosed in these forward-looking statements, and you should not place undue reliance on these forward-looking statements. Forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified. Information regarding certain risks, uncertainties and assumptions may be found in our filings with the Securities and Exchange Commission. New risk factors emerge from time to time and it is not possible for our management team to predict all risk factors or assess the impact of all factors on the business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in, or implied by, any forward-looking statements. While we may elect to update these forward-looking statements at some point in the future, we specifically disclaim any obligation to do so. These forward-looking statements should not be relied upon as representing our views as of any date subsequent to the date of this presentation.

This presentation discusses product candidates that are under preclinical or clinical evaluation and that have not yet been approved for marketing by the U.S. Food and Drug Administration or any other regulatory authority. The presentation also includes select interim and preliminary results from an ongoing clinical trial as of specific data cutoff dates. Such results should be viewed with caution as final results may differ as additional data becomes available. Until finalized in a clinical study report, clinical trial data presented herein remain subject to adjustment as a result of clinical site audits and other review processes. No representation is made as to the safety or effectiveness of these product candidates for the use for which such product candidates are being studied.

This presentation also contains estimates and other statistical data made by independent parties or publicly available information, as well as other information based on our internal sources. These data involve a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. We have not independently verified the accuracy or completeness of the data contained in these industry publications and other publicly available information. Accordingly, we makes no representations as to the accuracy or completeness of that data.

Agenda

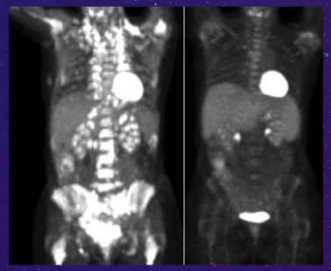
Opening Remarks	**Rami Elghandour** Chairman and Chief Executive Officer, Arcellx	10 Minutes
Phase I Study of CART-ddBCMA: A CART-Therapy Utilizing a Novel Synthetic Binding Domain for the Treatment of Subjects with Relapsed or Refractory Multiple Myeloma	**Matthew J. Frigault, M.D., M.S.** CART-ddBCMA and ACLX-001 Clinical Study Investigator, Assistant Director of the Cellular Therapy Service at Mass General Cancer Center and Instructor at Harvard Medical School	15 Minutes
Panel Discussion and Q&A	Panelists **Binod Dhakal, M.D., M.S.** CART-ddBCMA and ACLX-001 Clinical Study Investigator, Associate Professor of Medicine, Division of Hematology/Oncology Medical College of Wisconsin **Matthew J. Frigault, M.D., M.S.** Moderator: **Chris Heery, M.D.** Chief Medical Officer, Arcellx	45 Minutes


OUR MISSION
Advance humanity by engineering cell therapies that are safer, more effective, and more broadly accessible

Reimagining Cell Therapy

Novel Synthetic Binding Domain

Single-infusion ddCAR and dosable, controllable ARC-SparX platforms



Positive Preliminary Clinical Results

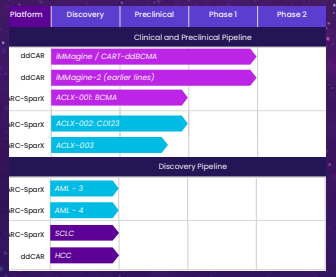
Demonstrated 100% overall response rate and deep durability in multiple myeloma Phase 1 study. Pivotal study planned for initiation by YE2022

Multiple Myeloma is the 3rd most common blood cancer

Impacting **100,000** patients annually

Significant Market Opportunity

2020 global multiple myeloma market of $18B; CAR-T multiple myeloma market projected at $10B



Platform Potential

ARC-SparX Phase 1 clinical trial in multiple myeloma planned for initiation in 1H22

ARC-SparX Phase 1 clinical trial in acute myelogenous leukemia / myelodysplastic syndrome planned for initiation in 2H22

Built for Success

Strong investor base

Exceptional team

Scalable CMC foundation

Wholly owned IP

Near-term catalysts

Arcellx

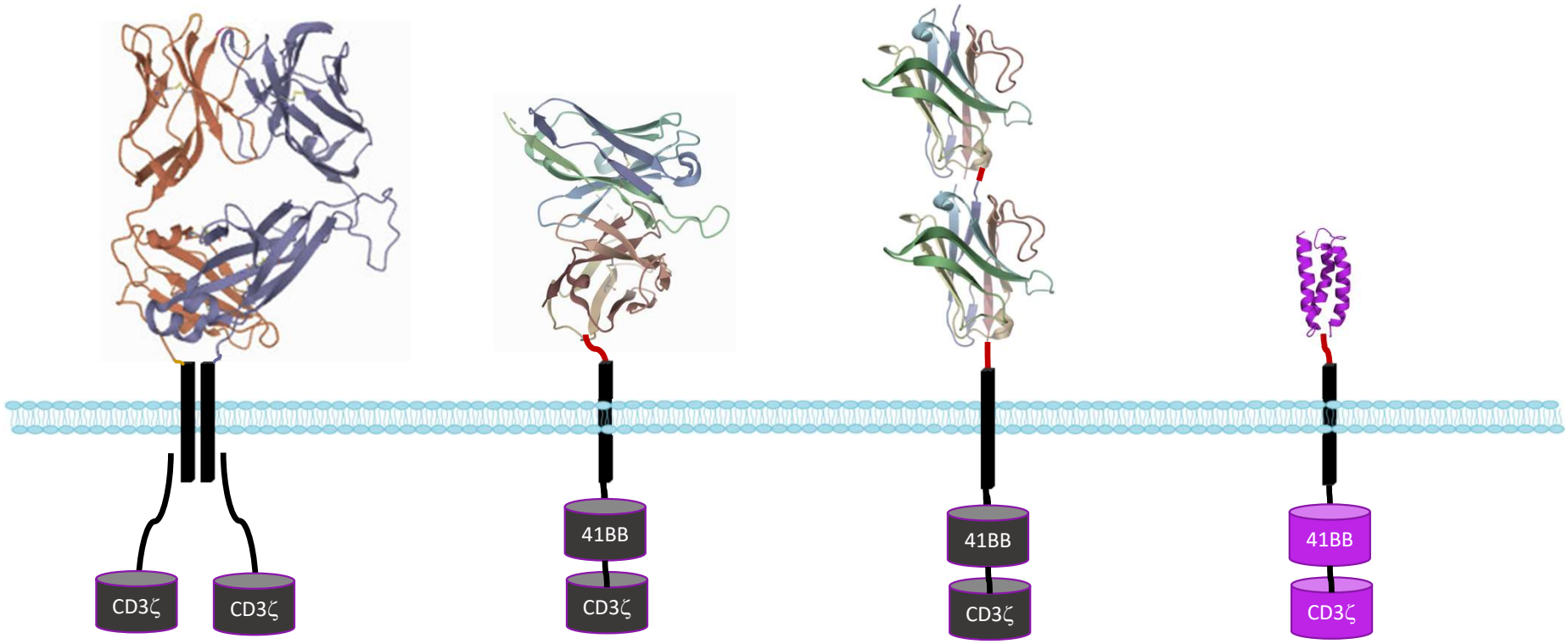
Binding Domain Differentiated by Size and Stability

TCR[1]
(50kDa)

scFv[2]
(25kDa)

Bi-Valent
Camelid VHh[3]
(25kDa)

D-Domain
(8kDa)



[1] Chan, KF. et al. 2018.,Nat Commun 9:1026-1026
[2] Bjerragaard-Anderson, K., et al 2018. Sci. Rep., 8:10836-10836.
[3] https://commons.wikimedia.org/wiki/File:1I3V_(Lama_VHH_domain_unligated).png#file

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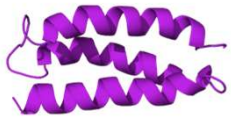
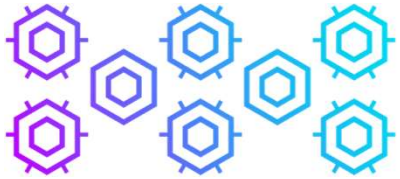
D-Domain Designed To Enhance Safety, Efficacy, and Availability



D-Domain

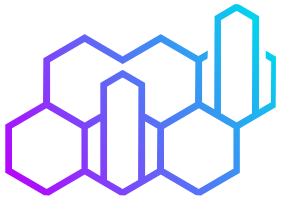
Hydrophobic Core & Stable



High Transduction Efficiency

Lower dose may lead to lower toxicity

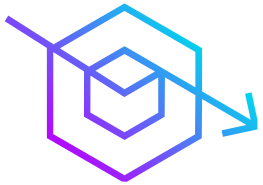
Preclinical and clinical evidence demonstrate CARs constructed with D-Domains have higher rates of transduction compared to scFv-based CARs



High Surface Expression

Potentially improved binding

The simple structure of D-Domains facilitates high cell surface expression of CAR constructs on the T cell surface.



Low Tonic Signaling

Reduced T cell exhaustion

D-Domains have biophysical properties that reduce high levels of aggregation leading to low tonic signaling that could lead to premature T cell exhaustion

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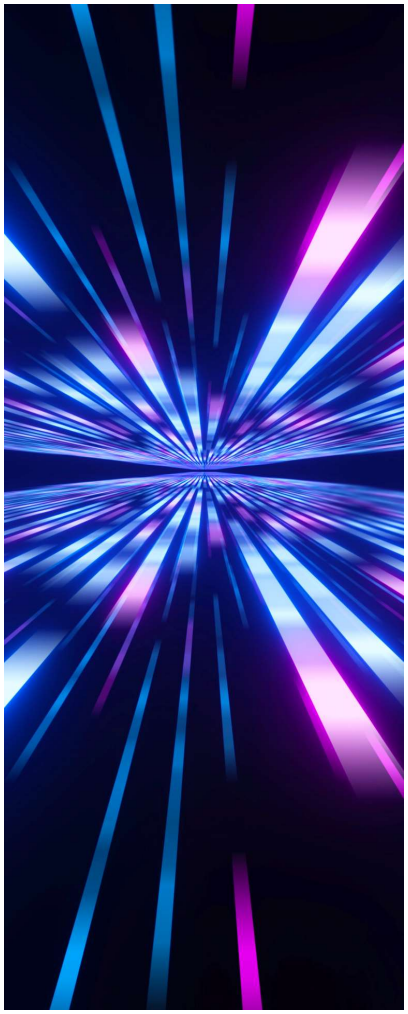
Multiple Myeloma is a Significant Market Opportunity

3rd most common blood cancer	Impacting **100,000** patients annually	Limited Therapies comprise **$18B** global market today
Incurable disease with **life expectancy of 5 years**	Growing opportunity for CAR-T solutions as **more effective** therapies move to **earlier line** patients	Total addressable market of **$10B** in CAR-T

A Rich Development Pipeline with Growth in Mind

Stage of Development						
Indication	**Platform**	**Discovery**	**Preclinical**	**Phase 1**	**Phase 2**	**Phase 3**
Clinical and Preclinical Pipeline						
Multiple Myeloma	ddCAR	*iMMagine / CART-ddBCMA*				
	ddCAR	*iMMagine-2 (earlier lines)*				
	ARC-SparX	*ACLX-001: BCMA*				
AML / MDS	ARC-SparX	*ACLX-002: CD123*				
	ARC-SparX	*ACLX-003*				
Discovery Pipeline						
AML / MDS	ARC-SparX	*AML - 3*				
	ARC-SparX	*AML - 4*				
Solid Tumors	ARC-SparX	*SCLC*				
	ddCAR	*HCC*				

Significant Near-term Milestones



Multiple Myeloma	Projected Date
ddCAR- FDA End-of-Phase 1 meeting	4Q21
ddCAR- ASH 2021 Data Update	4Q21
ARC-SparX - Initiate Phase 1 Enrollment in ACLX-001	1H22
ddCAR- Present Data Update	1H22
ddCAR- Present Data Update	Q422
ddCAR- Initiate Pivotal Study	YE22
ARC-SparX – Present interim clinical data from ACLX-001	2023
ddCAR- Initiate iMMagine-2, earlier line clinical trial	2023
ddCAR- Anticipated BLA filing for the treatment of BCMA	1H25

AML/MDS	Projected Date
ARC-SparX – Initiate ACLX-002 Phase 1 clinical trial in AML/MDS	2H22
ARC-SparX – Initiate ACLX-003 Phase 1 clinical trial in AML/MDS	2024

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Abstract #8003
Phase I study of CART-ddBCMA: a CART-Therapy Utilizing a Novel Synthetic Binding Domain for the Treatment of Subjects with Relapsed or Refractory Multiple Myeloma

Matthew J. Frigault, MD[1,2]; Jacalyn Rosenblatt, MD[3]; Noopur S. Raje, MD[1,2]; Daniella Cook, BS[1,2]; Andrew J Yee, MD[1,2]; Emma K. Logan[3]; Christine Cornwell[4]; Kamalika Banerjee, MS[4]; Anand Rotte, PhD[4]; Christopher R. Heery, MD[4]; David Avigan, MD[3]; Andrzej Jakubowiak[5]; and Michael R. Bishop, MD[5]

[1]Massachusetts General Hospital Cancer Center, Boston, MA; [2]Harvard Medical School, Boston, MA; [3]Beth Israel Deaconess Medical Center, Boston, MA; [4]Arcellx, Inc., Gaithersburg, MD;[5]The David and Etta Jonas Center for Cellular Therapy, University of Chicago, Chicago, IL

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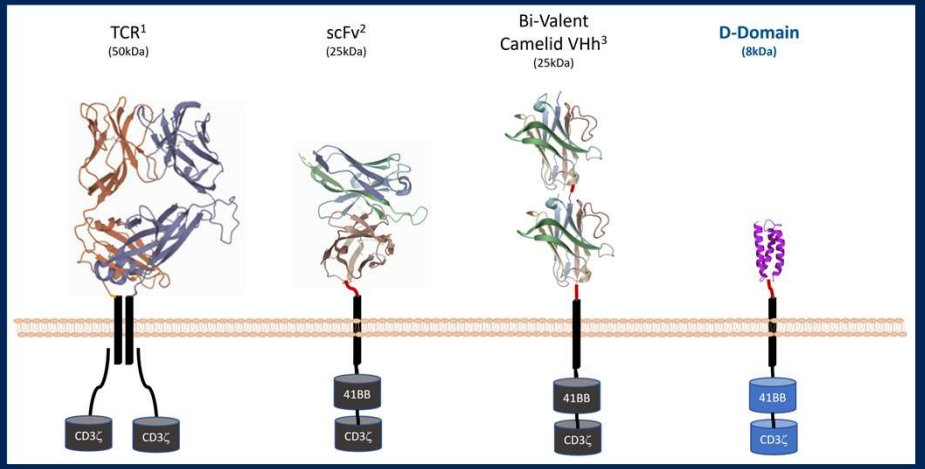
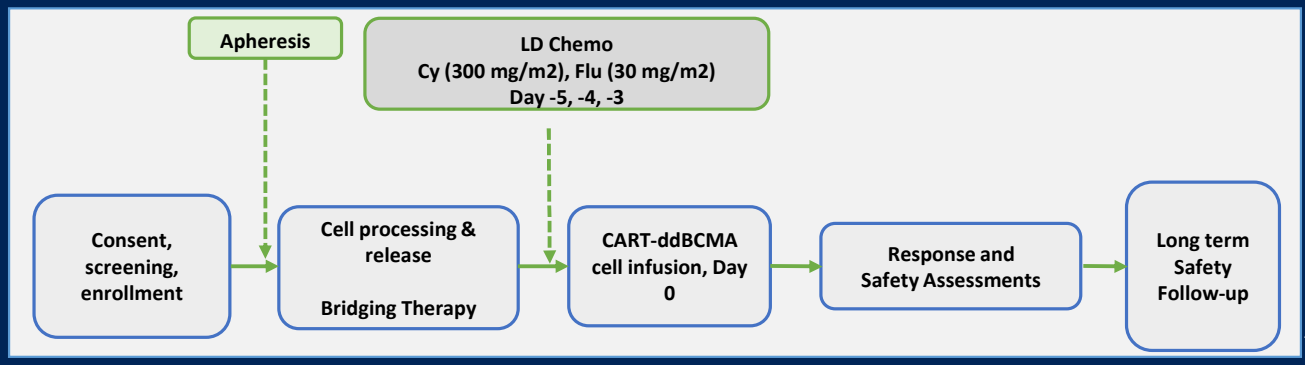
Dr Matthew Frigault MD
Administrative Director, Cellular Therapy Service, MGH

Background and Methods

- CART-ddBCMA is an autologous CAR-T containing a novel computationally designed synthetic protein[1,2] binding domain (non-scFv) engineered to reduce the risk of immunogenicity and is highly stable
- Phase 1 first-in-human trial is in progress, enrolling patients with relapsed or refractory myeloma
  - Prior IMiD, PI, and CD38-targeted therapy
  - Received ≥3 prior therapies or triple refractory
  - 2 Dose Levels evaluated, 6 subjects in each dose escalation cohort.
    - DL1 = 100 x 10^6 CAR+ cells; DL2 = 300 x 10^6 CAR+ cells
  - Expansion cohort is enrolled at DL1



[1] Chan, KF. et al. 2018.,Nat Commun 9:1026-1026
[2] Bjerragaard-Anderson, K., et al 2018. Sci. Rep., 8:10836-10836.
[3] https://commons.wikimedia.org/wiki/File:1i3V_(Lama_VHH_domain_unligated).png#file



[1]Rotte, et al. "BCMA targeting CAR T cells using a novel D-domain binder for multiple myeloma: clinical development update." *Immuno-Oncology Insights 2022; 3(1), 13–24*
[2]Frigault et al. "Phase 1 Study of CART-ddBCMA for the treatment of subjects with relapsed and refractory Multiple Myeloma." Blood Advances 2022; bloodadvances.2022007210. doi: https://doi.org/10.1182/bloodadvances.2022007210.

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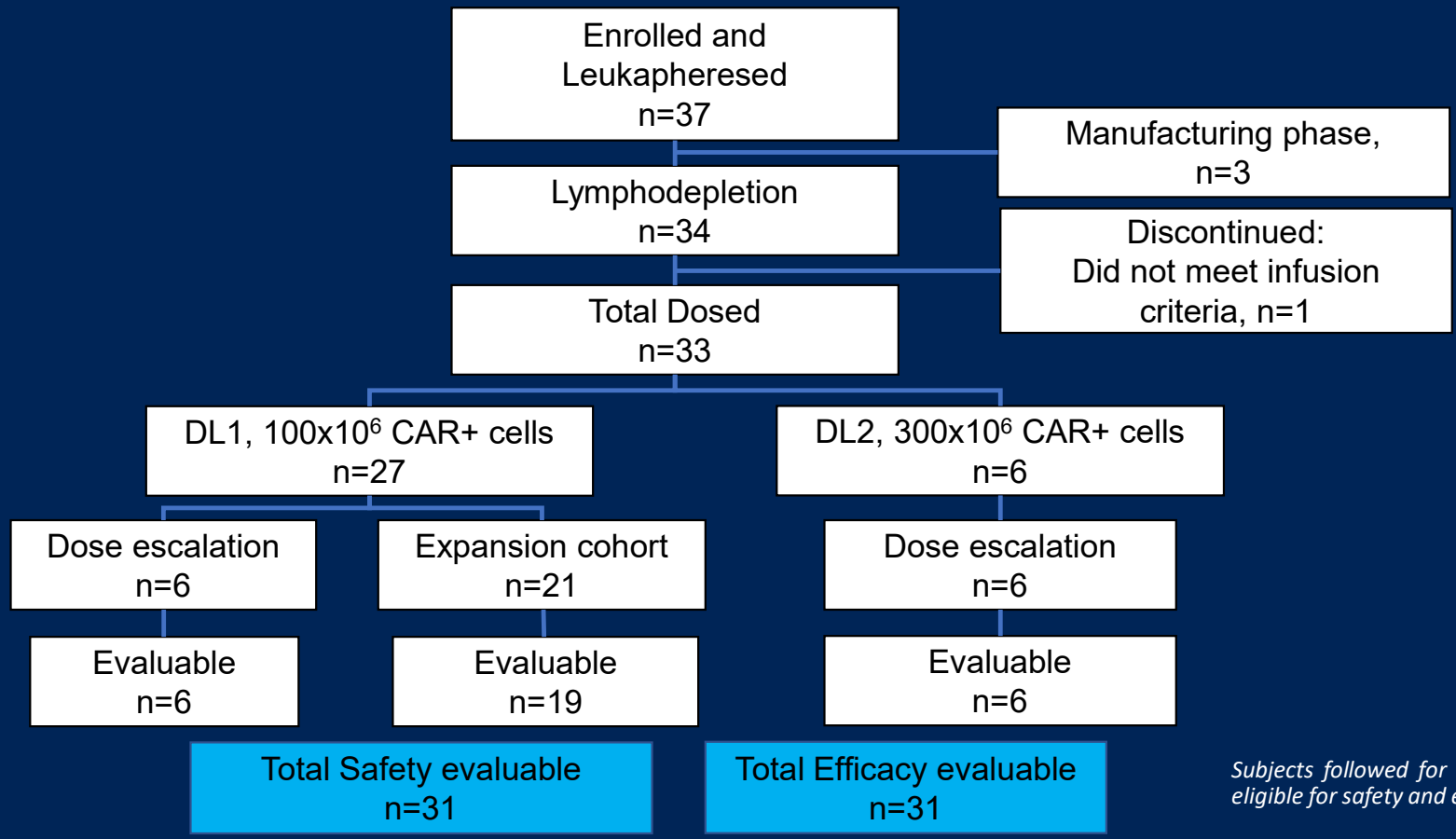
Patient Disposition



Subjects followed for >1 month f/u are eligible for safety and efficacy analysis.

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Patient Demographics (as of 03 MAY 2022)

Characteristics	Dose Level 1 100 million CAR-T (n=25)	Dose Level 2 300 million CAR-T (n=6)	Total (n=31)
Age, median (min-max)	68 (44-76)	60 (52-65)	66 (44-76)
Gender	13 Male (52%) 12 Female (48%)	5 Male (83%) 1 Female (17%)	18 Male (58%) 13 Female (42%)
BMPC ≥50%	7 (28%)	5 (83%)**	12 (39%)
Extra-medullary disease	9 (36%)	3 (50%)	12 (39%)
Prior Lines of Therapy, Median (min – max) *	5 (3 – 7)	4 (3 – 16)	5 (3 – 16)
Triple refractory	19 (76%)	5 (83%)	24 (77%)
Penta refractory	17 (68%)	4 (67%)	21 (68%)
IgG myeloma IgA myeloma Light chain only	14 4 5	5 0 1	19 4 6

*Two subjects with ongoing data entry excluded
**Data updated since ASH 2021 after full data entry was complete.

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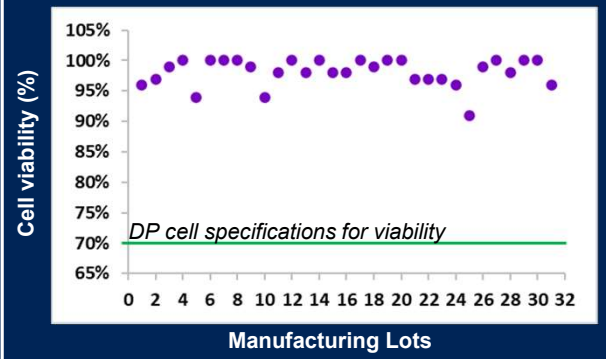
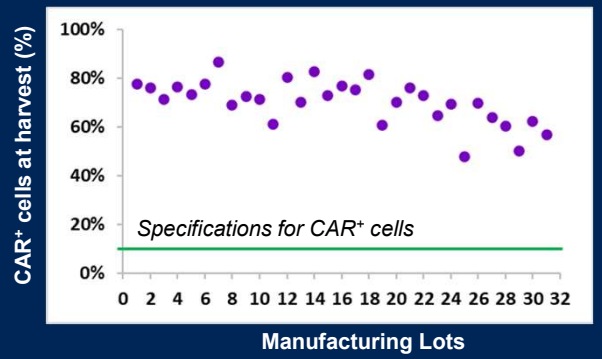
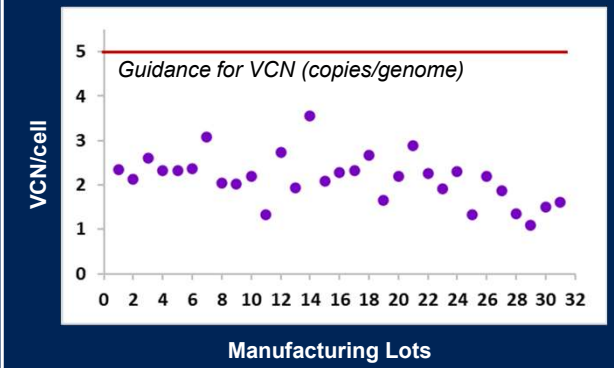
CART-ddBCMA Manufacturing Results in Consistent Product Profile



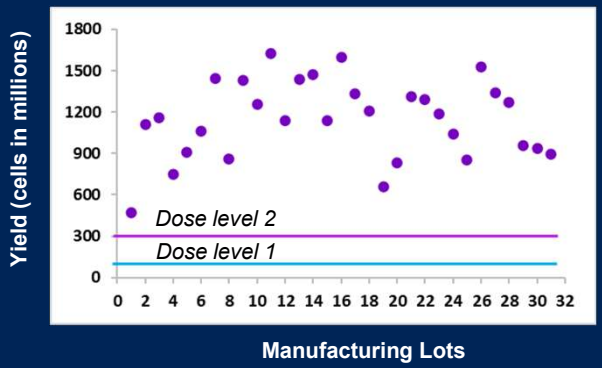
High cell viability: median 99% viable cells



Low inter-patient variability in CAR+ cells: median 72% CAR+ cells



Low inter-patient variability in CAR expression/cell: median 2.2 copies/cell



High yield: ≥3 doses of DL1 can be administered from a single manufacture run

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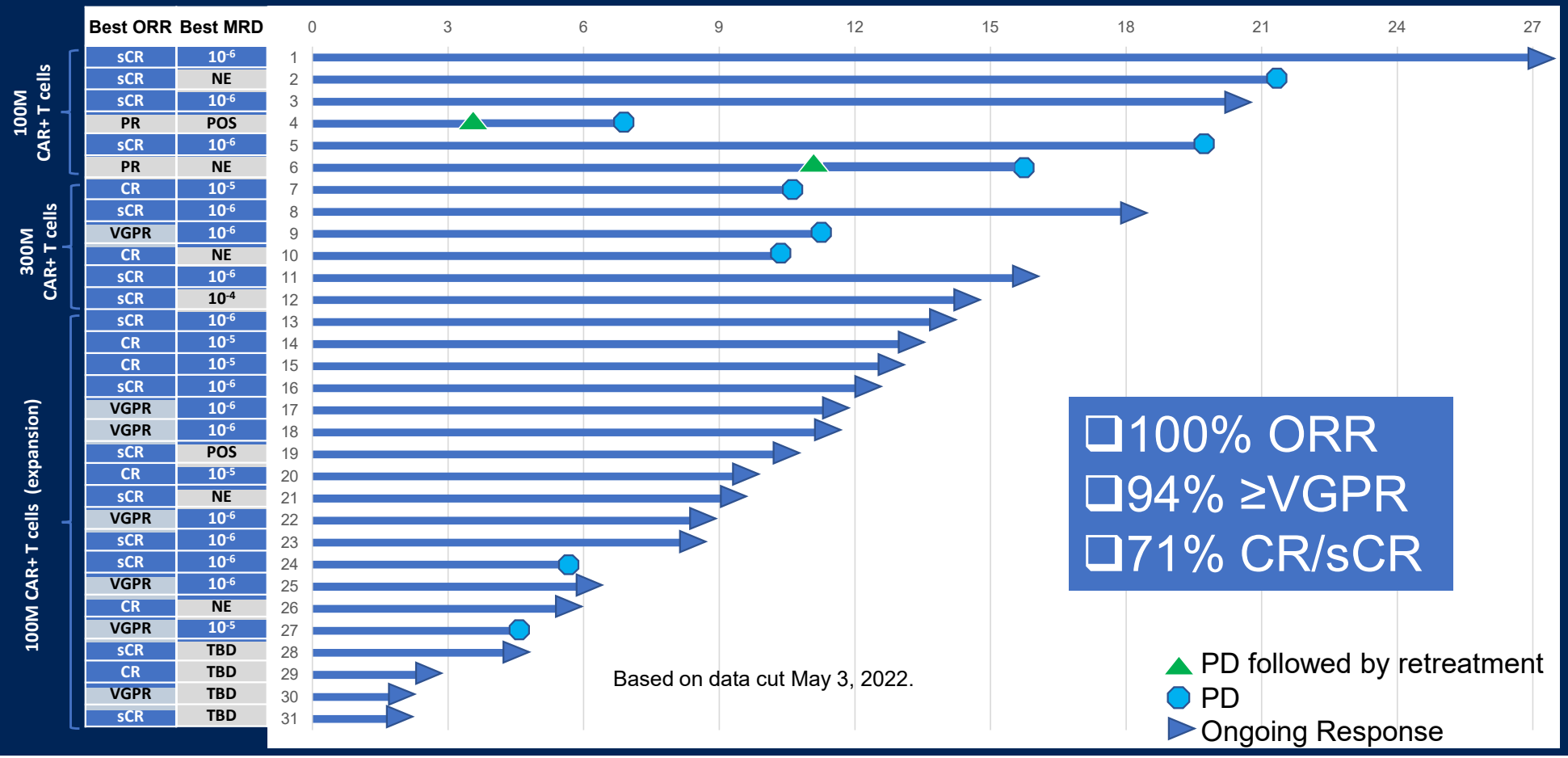
CART-ddBCMA: 100% ORR and Durable Responses



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CART-ddBCMA Responses Deepen Over Time

	CART-ddBCMA		
Minimum follow-up (mo)	**1**	**6**	**12**
Sample Size (n)	31	24	16
Median Follow-up (mo)	12.1	13.3	17.7
EMD # (%)	12 (39%)	12 (50%)	8 (50%)
ORR	100%	100%	100%
CR rate	22 (71%)	19 (79%)	13 (81%)
% of patients in ongoing response:			
@ 6 months	-	92% (22/24)	94% (15/16)
@ 12 months	-	-	69% (11/16)

Based on data cut May 3, 2022.

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Administrative Director, Cellular Therapy Service, MGH

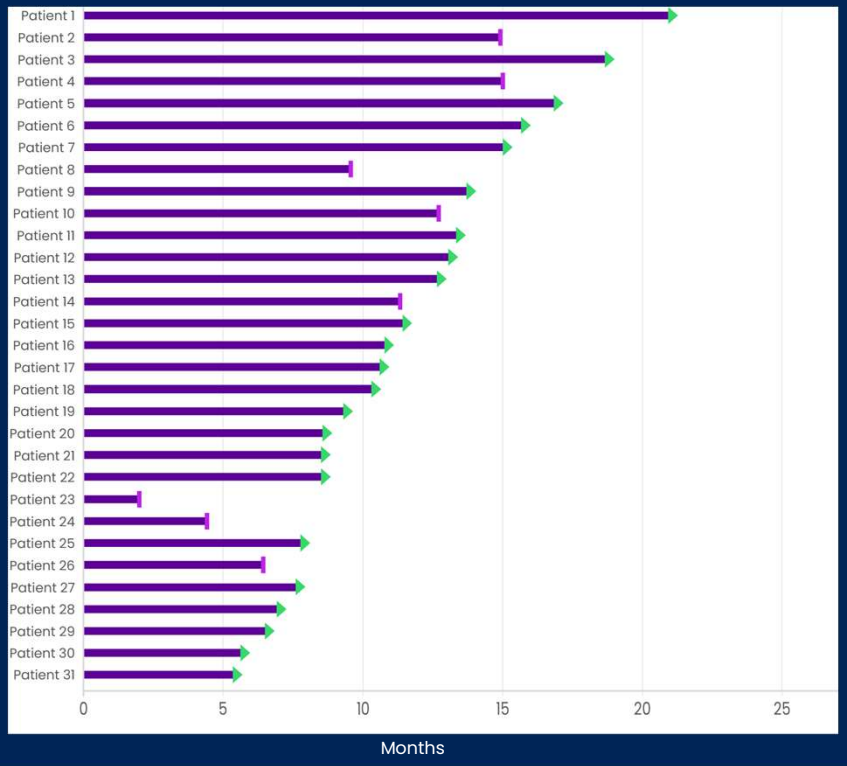
CART-ddBCMA Responses Deepen Over Time

	CART-ddBCMA			LEGEND-2	CARTITUDE-1	
Minimum follow-up (mo)	1	6	12	1	1.5	13.5 (est)
Sample Size (n)	31	24	16	57	97	
Median Follow-up (mo)	12.1	13.3	17.7	8	12.4	24
EMD # (%)	12 (39%)	12 (50%)	8 (50%)	17 (30%)	13%	13%
ORR	100%	100%	100%	88%	97%	98%
CR rate	22 (71%)	19 (79%)	13 (81%)	68%	67%	83%
% of patients in ongoing response:						
@ 6 months	-	92% (22/24)	94% (15/16)	~82%	87%	
@ 12 months	-	-	69% (11/16)	~70%	~75%	

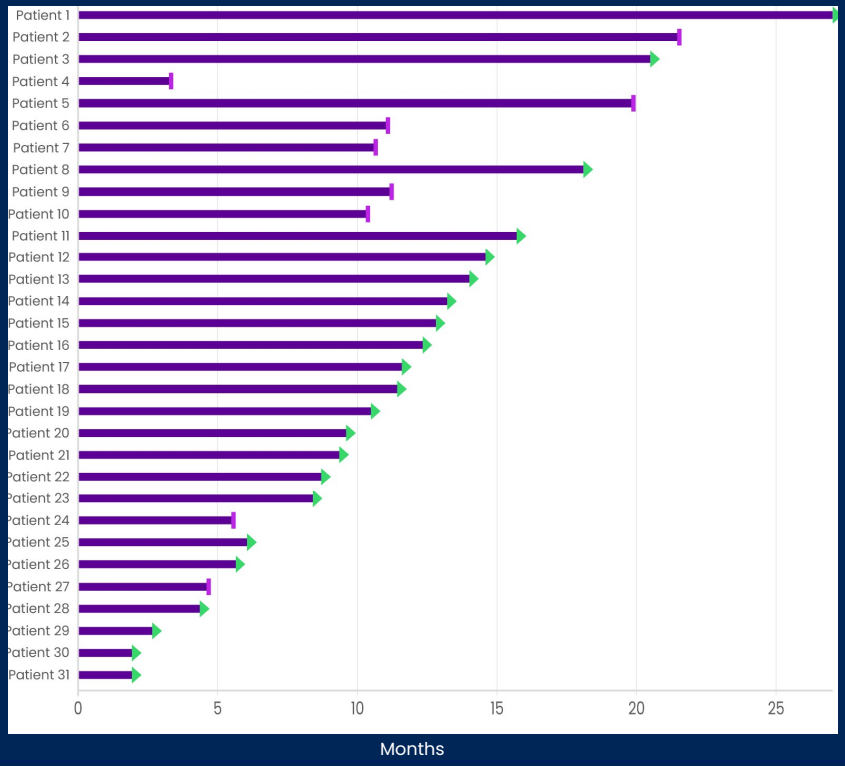
Comparison of Swimmer Plots: LEGEND-2 vs CART-ddBCCMA

Responses and Duration of Follow-up

LEGEND-2
8 of first 31 patients progressed within first 16 months



CART-ddBCMA Ph 1
7 of first 31 patients progressed within first 16 months



Adverse Event Profile (as of 03 MAY 2022)

Grade 3/4 AEs (non-CRS/ICANS) ≥5% after cell infusion (N=31)	
Hematologic	
Neutrophil count decreased	24 (77.4%)
Anemia	15 (48.4%)
Thrombocytopenia	13 (41.9%)
Lymphocyte count decreased	12 (38.7%)
Febrile neutropenia	6 (19.4%)
White blood cell count decreased	6 (19.4%)
Non-hematologic	
Hypertension	3 (9.7%)
Cellulitis	2 (6.5%)
Hyponatraemia	2 (6.5%)
Hypotension	2 (6.5%)
Sepsis	2 (6.5%)

CAR-T-associated AEs Per ASTCT criteria	100 million (N=25)		300 million (N=6)	
Cytokine Release Syndrome (CRS)	**Grade 1/2**	**Grade 3**	**Grade 1/2**	**Grade 3**
	22 (88%)	**0**	**5 (83%)**	**1 (17%)**
Median onset (min-max)*	2 days (1-8 days)		2 day (1-2 days)	
Median duration (min-max)	8 days (3-13 days)		5 days (3-10 days)	
Neurotoxicity (ICANs)	**Grade 1/2**	**Grade 3**	**Grade 1/2**	**Grade 3**
	5 (20%)	**1 (4%)**	**0**	**1 (17%)**
Median onset (min-max)*	4.5 days (3-6 days)		7 days	
Median duration (min-max)	7.5 days (4 - 11 days)		23 days	
Toxicity Management				
Tocilizumab	19		5	
Dexamethasone	13		2	

Subjects followed for <1 month are not yet evaluable for safety analyses.

* *Infusion Day 0 is considered Study Day 1*

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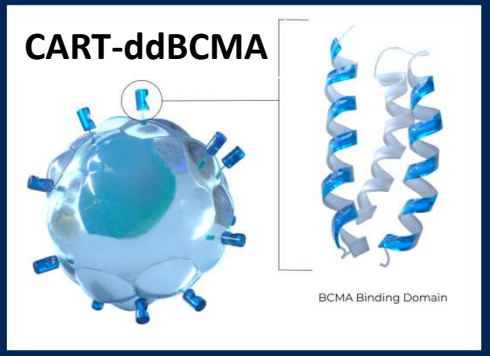
Administrative Director, Cellular Therapy Service, MGH

CART-ddBCMA Phase 1: Conclusions

- **CART-ddBCMA utilizes a novel, synthetic highly stable binding domain**
  - 2 dose levels studied (100 and 300 million CAR+ T-cells); MTD not reached
  - High CAR-T cell viability, low inter-patient variability in CAR+ cells and high CAR-T cell yield
  - Phase 1 expansion at 100 million CAR+ T cells resulted in selection of this dose as RP2D
- **Adverse Event Profile appears potentially differentiated from other CAR T products**
  - No tissue-targeted toxicities observed
  - No cases grade 3 (or greater) CRS, 1 case (4%) Grade 3 ICANS event at RP2D (n=25)
  - No delayed neurotoxicity or parkinsonian-like events observed in entire population (n=31)
- **100% ORR per IMWG across both dose levels**
- **Deep and durable responses observed in patients with poor prognostic factors**
  - **All Patients (39% EMD): 31/31 (100%) ORR; 22/31 (71%) CR/sCR**, 7/31 (23%) VGPR, 2/31 (6%) PR; ≥VGPR = 29/31 (94%)
  - **Pts w/ 6 mo f/u (50% EMD): 24/24 (100%) ORR; 19/24 (79%) CR/sCR**, 3/24 (13%) VGPR, 2/24 (8%) PR; ≥VGPR = 22/24 (92%)
  - **Pts w/ 12 mo f/u (50% EMD): 16/16 (100%) ORR; 13/16 (81%) CR/sCR**, 1/16 (6%) VGPR, 2/16 (13%) PR; ≥VGPR = 14/16 (88%)
- **Pivotal phase 2 trial initiation this year**



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Administrative Director, Cellular Therapy Service, MGH

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Panel Discussion
Moderated by Dr. Chris Heery

BCMA CAR T cells: Best Safety and Efficacy for Multiple Myeloma

	ORR	CR Rate	Grade 3/4 CRS	Grade 3/4 Neurotoxicity
Antibody Drug Conjugates[1]	30-35%	1-5%	-	-
Bispecific T Cell Engagers[2,3,4]	60-80%	20-40%	1-3%	~0-1%
ABECMA[5]	73%	31%	9%	4%
CARVYKTI[6]	98%	~80%	4%	9%**
CART-ddBCMA	100%	~70%	0%	4%

*Only reported for responders (92% PFS at 6 months for responders)
**Includes all neurotoxicities. Total Grade 3 / 4 ICANS events reported as 2%.

1. Lonial, et al. Lancet. Vol 21, Issue 2, P207-221, Feb 2020.
2. Kumar, et al. ASH 2021, Abstract 900.
3. Sebag, et al. ASH 2021, Abstract 895.
4. Moreau, et al. ASH 2021, Abstract 896.
5. Munshi, et al. NEJM 2021; 384:705-716.
6. Berdeja, et al. Lancet 2021; 398:314-24.

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Q&A