CARTESIAN THERAPEUTICS

Pioneering mRNA Cell Therapy for Autoimmunity

May 2024

Forward-Looking Statements

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Clinical-stage company pioneering mRNA cell therapies designed to expand the reach of cell therapy to autoimmunity

- Pipeline of mRNA cell therapies designed to be dosed more reliably and safely in an outpatient setting **without lymphodepletion**
- Descartes-08: Potential first-in-class mRNA CAR T-cell (CAR-T) demonstrated **deep and durable clinical responses** in Phase 2a study in patients with myasthenia gravis (MG)
- **Wholly-owned GMP manufacturing** designed to enable rapid optimization of processes in iterative manner

MULTIPLE ANTICIPATED NEAR-TERM CATALYSTS

DESCARTES-08

- Phase 2b topline data in MG expected mid-2024
- Initiation of Phase 2 study in SLE expected in 1H 2024
- Initiation of studies in additional autoimmune indications expected in 2H 2024

DESCARTES-15

- Next-generation mRNA CAR-T candidate
- IND cleared, with first-in-human Phase 1 planning activities underway

STRONG CASH RESOURCES

$104.8M as of March 31, 2024; expected to fund currently planned operations into 2H26

Expected to provide for continued clinical development of Descartes-08 in MG through Phase 3 and multiple additional clinical programs

Cartesian® THERAPEUTICS

CAR, Chimeric antigen receptor
SLE, Systemic Lupus Erythematosus

Experienced management team to lead the mRNA cell therapy company of the future

MANAGEMENT

Carsten Brunn, PhD
President and CEO

Blaine Davis
CFO

Metin Kurtoglu, MD, PhD
CTO

Emily English, PhD
SVP, Head of Manufacturing Operations

Chris Jewell, PhD
CSO

Milos Miljkovic, MD
CMO

Jessica Keliher
CPO

Matthew Bartholomae
General Counsel

BOARD MEMBERS

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Director

Nishan De Silva, MD
Director

Murat Kalayoglu, MD, PhD
Director

Michael Singer, MD, PhD
Director

Timothy Springer, PhD
Director

Patrick Zenner
Director

Cartesian's mRNA approach is designed to expand the reach of potent cell therapy products to address potential autoimmune indications

Cartesian THERAPEUTICS mRNA Cell Therapy

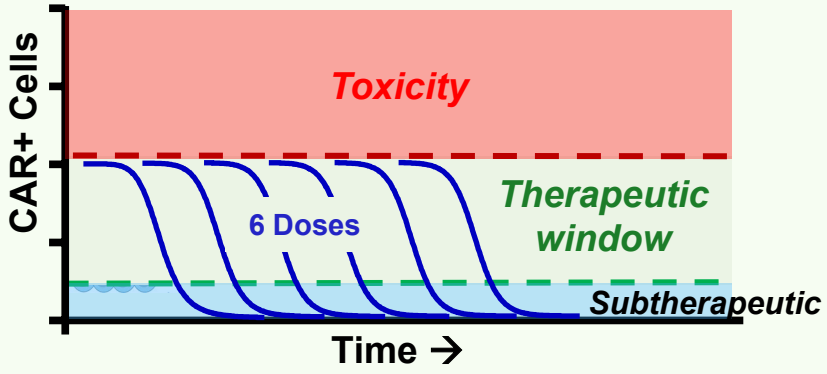
No Lymphodepleting Chemotherapy Required
No requirement for cell proliferation → no expected need for pre-treatment chemotherapy → no Grade 3-4 cytopenias

Administered Outpatient
Reduced patient burden and lower indirect cost

Delivered at Therapeutic Levels
Expectation for cells to be administered at therapeutic, but sub-toxic doses

Controllable PK/PD
mRNA does not replicate → predictable half-life with more controllable PK/PD defined by the dose

Transient Cell Modification
Does not carry risk of genomic integration



Conventional DNA Cell Therapy

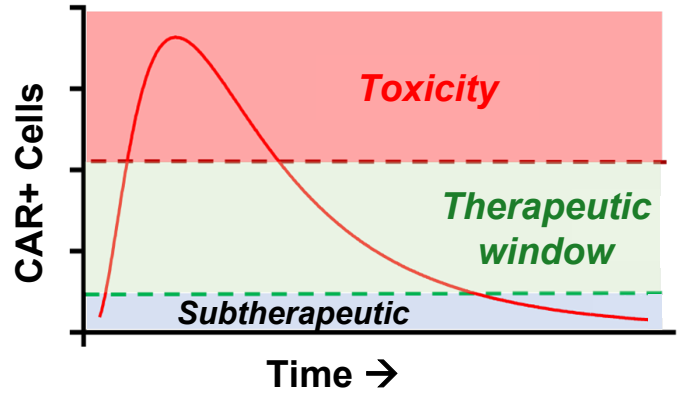
Requires Lymphodepleting Chemotherapy
Associated with high rates of toxicity, including cytokine release syndrome

Requires Inpatient Administration
High patient burden resulting in higher indirect costs

Administered at Subtherapeutic Levels
Cells proliferate rapidly beyond therapeutic window

Uncontrollable PK/PD
Effector function of cell therapy engineered with DNA amplifies exponentially with cell replication

Permanent Cell Modification
Associated with insertional mutagenesis leading to potential secondary malignancies



Wholly-owned pipeline targets autoimmune disease

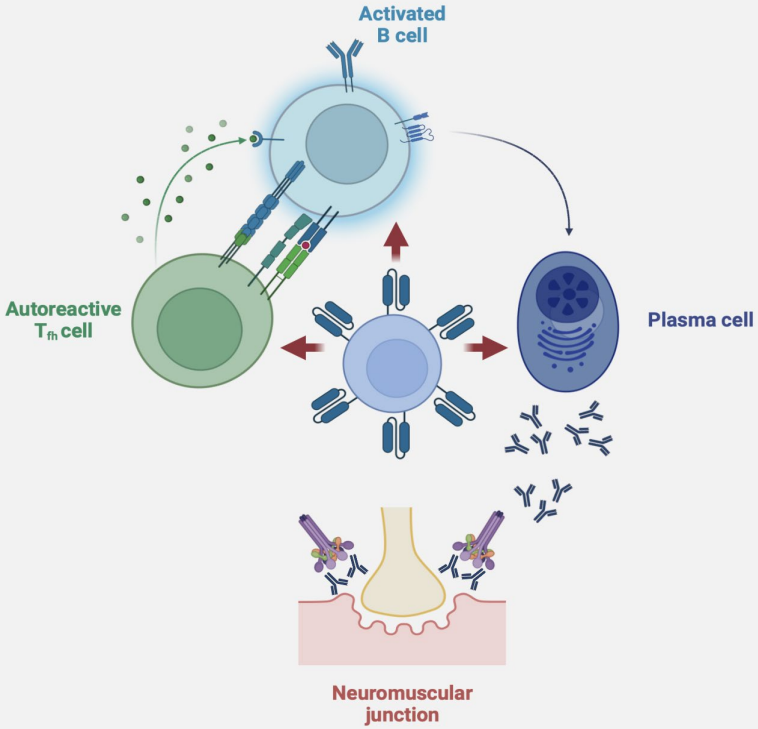
Asset	Indications	Discovery/Preclinical	Phase 1	Phase 2	Pivotal
Descartes-08 Autologous mRNA CAR-T	Myasthenia Gravis				
	SLE, other Autoimmune Diseases				
Descartes-15 Autologous mRNA CAR-T	Autoimmune Diseases*				
Descartes-33 Allogeneic mRNA MSC	Autoimmune Diseases				
***In situ* LN transfection**	Undisclosed				

SLE, Systemic Lupus Erythematosus
mRNA MSC, Mesenchymal Stem Cells transfected with mRNA

* Phase 1 dose escalation study in myeloma underway
LN, Lymph node

Descartes-08 is believed to be the first mRNA CAR-T in clinical development for autoimmune disease

- **Engineered by transfection of autologous CD8+ T cells with mRNA encoding anti-BCMA CAR**
- Typical lot **processed for infusion within ~3 weeks**
- **Positive Phase 2a data** in myasthenia gravis underscores potential for deep and durable responses
- Granted **U.S. FDA orphan designation** for generalized myasthenia gravis



Descartes-08 is designed for dual action, precisely targeting two key BCMA+ cell populations involved in a spectrum of autoimmune diseases

Descartes-08 is designed to target BCMA, a surface antigen expressed on ***plasma cells/plasmablasts*** and ***plasmacytoid dendritic cells***

PLASMA CELLS (PCs) AND PLASMABLASTS

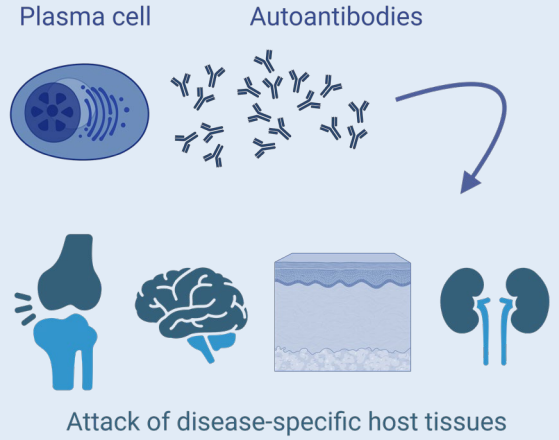
- PCs, plasmablasts and proliferating B cells targeted by Descartes-08 represent a tiny fraction of B cells
- These cells are entirely responsible for secreting pathogenic autoantibodies
- During autoimmunity, autoantibodies attack host tissue and drive inflammation

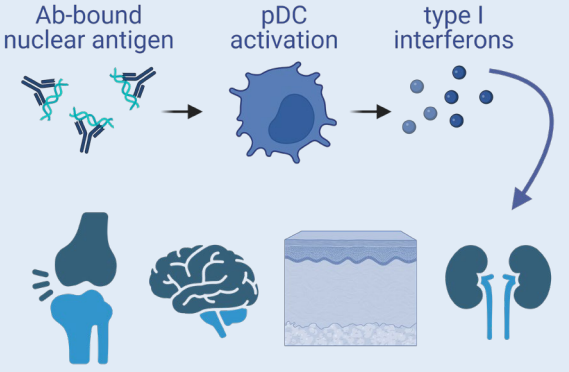
PLASMACYTOID DENDRITIC CELLS (pDCs)

- pDCs, which Descartes-08 is designed to target, are a rare subset of antigen-presenting cells
- These cells secrete high levels of cytokines (i.e., type I interferons) that cause inflammation and tissue damage during many human autoimmune diseases
- pDCs are increased in patients with autoimmunity (e.g., SLE) and interfere with optimal treatment

Several autoimmune disease segments involve pathogenic contributions from ***both PCs/plasmablasts*** and ***pDCs***, including rheumatology, nephrology, neurology, and others

Selectively deleting PCs/plasmablasts and pDCs, if successful, may create a differentiated cell therapy platform

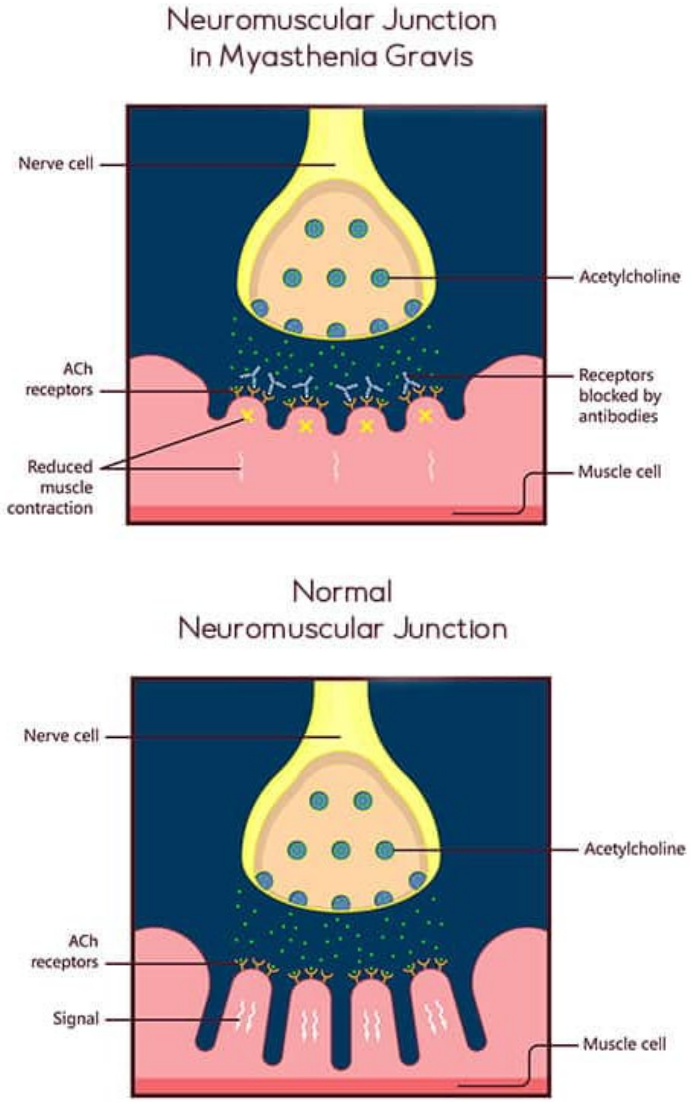




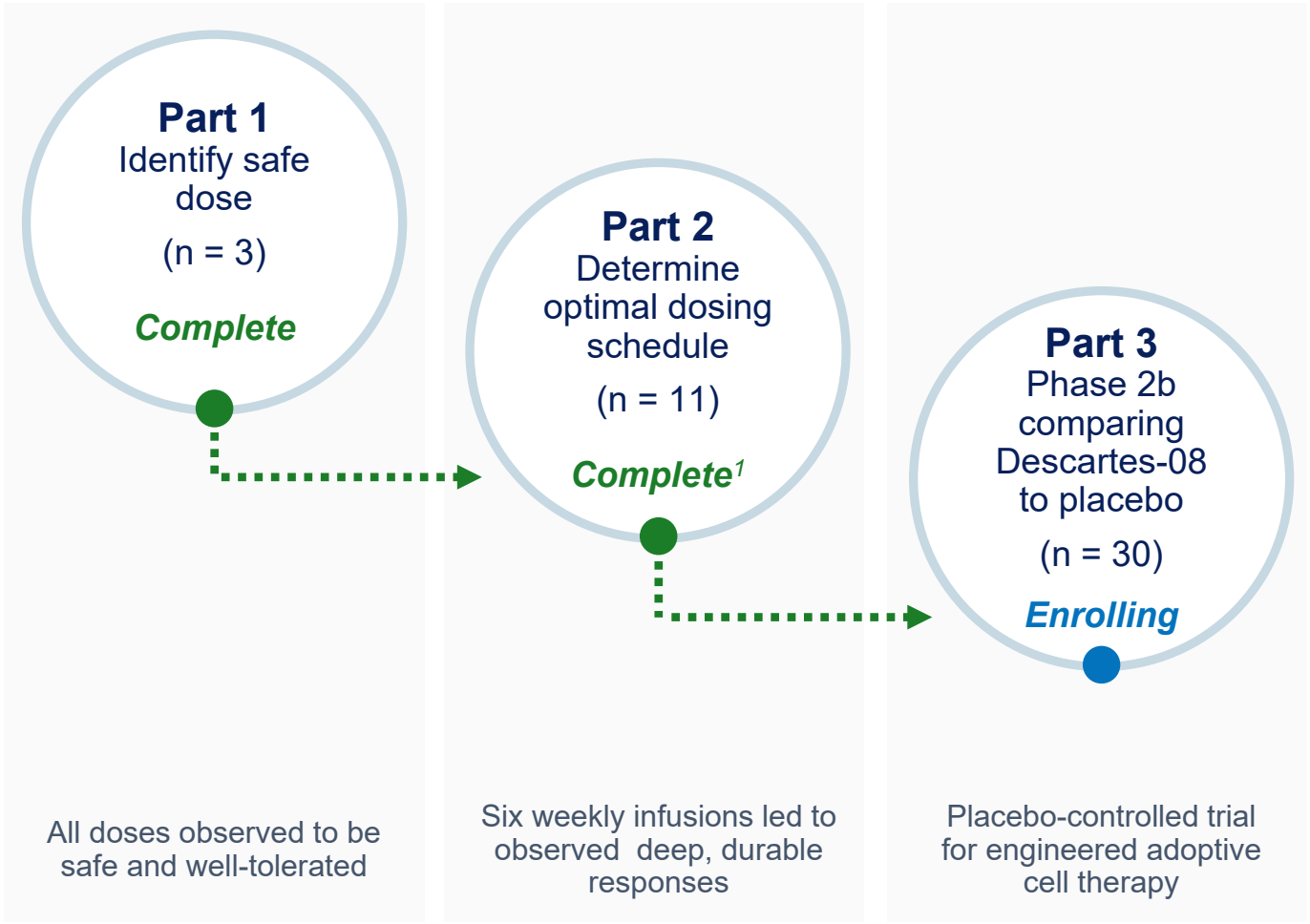
BCMA: B cell maturation antigen; SLE: systemic lupus erythematosus

Initial indication for Descartes-08: Myasthenia gravis

- Affects **over 120,000 patients** in US and EU
- Characterized by debilitating weakness: limbs, respiratory, ocular, facial muscles
- **Standard of care** includes **chronic use of immunosuppressants**, which are **often toxic:**
  - Progressive disease that is fatal in 1/3 of patients without immunosuppressants
- Newer agents include **complement inhibitors and anti-FcRn mAbs**, which must be **administered chronically** to maintain responses
- **Pathogenesis is similar across many autoimmune diseases;** involves attack on self by both T cells and B/plasma cells



Phase 2 study of Descartes-08 in MG (NCT04146051)



Patient eligibility

- MG-ADL ≥ 6
- MGFA Class II-IV
- Stable medication dosing ≥ 8 wks prior to infusion
- 4-week washout for biologics
- IVIg and plasma exchange not allowed after starting Descartes-08

Patients on immunosuppression or complement inhibitors expected to be able to continue their treatment while receiving Descartes-08

Cell manufacturing platform tolerates most standard immunosuppressive therapies

[1] Continues to enroll patients with MuSK MG and subjects who are otherwise not eligible for Part 3
MG-ADL, Myasthenia Gravis Activities of Daily Living scale
MGFA, Myasthenia Gravis Foundation of America

Phase 1/2a study population comprises patients with significant disease

THE LANCET Neurology

Volume 22, Issue 7, July 2023, Pages 578-590

- Baseline MG-ADL mean score of 10
- 79% were MGFA Class III-IV at screening
- All patients presented with disease that was not controlled with standard of care therapies

Mean age, years (SD)	52 (18)
Female	10 (71%)
Male	4 (29%)
Mean weight, kg (SD)	84 (21)
Mean BMI, kg/m^2 (SD)	31.6 (8.1)
Race and ethnicity	
White, non-Hispanic	11 (79%)
White, Hispanic	1 (7%)
Asian	2 (14%)
MGFA class at screening	
II	3 (21%)
III	10 (71%)
IV	1 (7%)
Median age of disease onset, years (range)	40 (14-79)
Median duration of disease, years (range)	14 (3-27)
Myasthenia gravis antibody status	
Anti-AChR antibody	11 (79%)
Anti-MuSK antibody	2 (14%)
Seronegative (for AChR, MuSK, and LRP4 antibodies)	1 (7%)
Mean baseline scores (SD)	
QMG	15.3 (4.1)
MG-ADL	10.0 (3.2)
MGC	21.9 (5.7)
MG-QoL-15r	19.9 (5.8)

Previous myasthenia gravis therapies (standard of care)	
Pyridostigmine	14 (100%)
Prednisone	14 (100%)
Other immunosuppressants	14 (100%)
Eculizumab	2 (14%)
Rituximab	2 (14%)
Previous intravenous immunoglobin	12 (86%)
Previous plasma exchange	8 (57%)
Diagnosis of thymoma	0
Previous thymectomy	6 (43%)
Previous myasthenia gravis crisis requiring intubation	4 (29%)
Myasthenia gravis ongoing therapy	
Pyridostigmine	11 (79%)
Prednisone	10 (71%)
Azathioprine	1 (7%)
Mycophenolate mofetil	1 (7%)

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Descartes-08 was observed to be safe and well-tolerated in MG

THE LANCET Neurology

Volume 22, Issue 7, July 2023, Pages 578-590

KEY OBSERVATIONS:

- No dose-limiting toxicities
- No cytokine release syndrome
- No neurotoxicity
- No pre-treatment chemotherapy and related cytopenias
- Outpatient treatment

	Grade*	Part 1 (n=3)	Part 2: all groups (n=11)	Part 2: group 1 (n=3)	Part 2: group 2 (n=7)	Part 2: group 3 (n=1)
Hand numbness	2	1 (33%)	0	0	0	0
Headache	1	1 (33%)	5 (45%)	1 (33%)	3 (43%)	1 (100%)
Muscle soreness	1	1 (33%)	1 (9%)	0	1 (14%)	0
Nausea	1	1 (33%)	4 (36%)	2 (67%)	2 (29%)	0
Rash	3	0	1 (9%)	1 (33%)	0	0
Itchy throat	1	0	2 (18%)	0	1 (14%)	1 (100%)
Vomiting	1	0	3 (27%)	2 (67%)	1 (14%)	0
Weakness	1	0	2 (18%)	2 (67%)	0	0
Line infiltration	1	0	1 (9%)	1 (33%)	0	0
Fever	1	0	4 (36%)	1 (33%)	3 (43%)	0
Shortness of breath[1]	1	0	2 (18%)	1 (33%)	1 (14%)	0
Chills	1	0	2 (18%)	1 (33%)	1 (14%)	0
Diarrhoea	1	0	1 (9%)	1 (33%)	1 (14%)	0
Gum inflammation	1	0	1 (9%)	0	1 (14%)	0
Teeth sensitivity	1	0	1 (9%)	0	1 (14%)	0
Night sweats	1	0	1 (9%)	0	1 (14%)	0
Restless leg	1	0	1 (9%)	0	1 (14%)	0
Light-headedness	1	0	1 (9%)	0	1 (14%)	0

*There were no adverse events of grade 3 or higher reported in part 1, and no grade 2 or grade 4 events reported in part 2, where grade 1 is mild, grade 2 is moderate, grade 3 is severe, and grade 4 is life-threatening.

[1]Not associated with hypoxia

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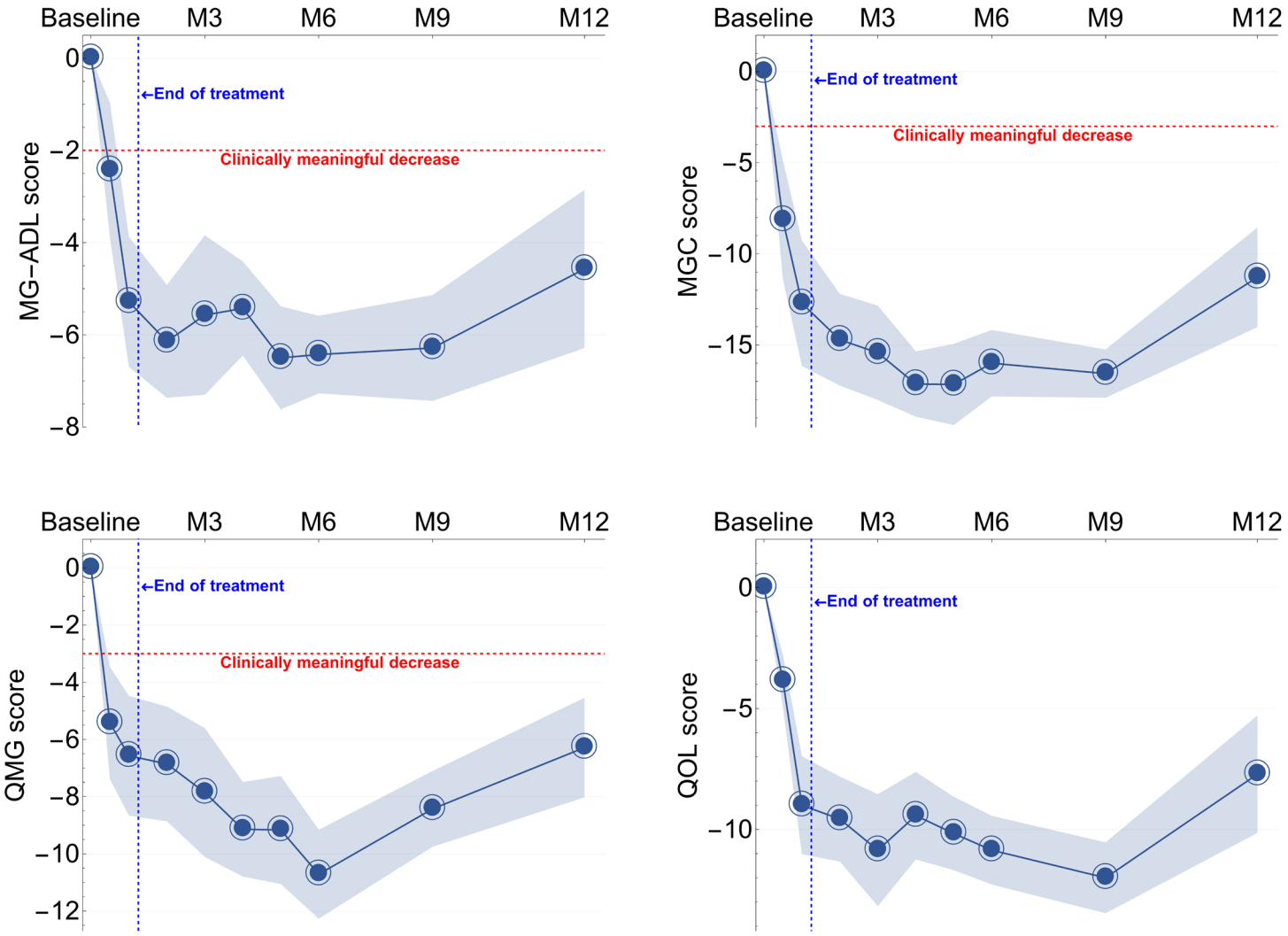
Descartes-08 observed to induce deep and durable clinical improvement in MG

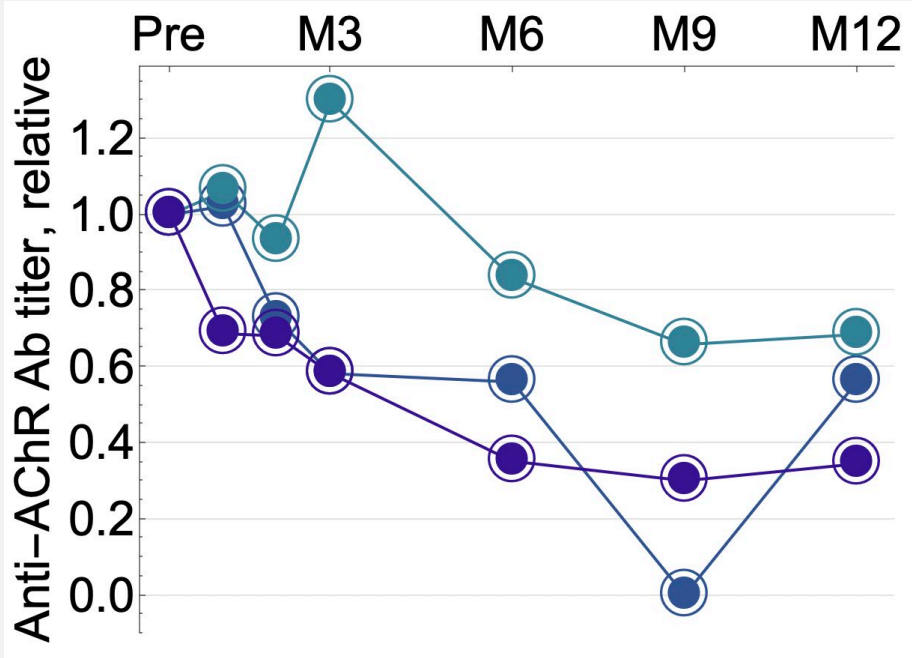
- **Notable magnitude and duration of response** across all 4 standard MG severity scales
- Responses appear **to *deepen after completing treatment*** at Week 6
- **Positive** twelve-month follow-up data from Phase 2a study reinforce prior findings published in *Lancet Neurology*



Manuscript submitted for peer review; pre-print available at medRxiv.org
Efficacy dataset includes all MG patients completing the 6-dose once-weekly regimen (n=7). Data are mean score improvement (point) and standard error (light blue shading). Note that QOL scale does not have an agreed-upon threshold for clinically meaningful disease improvement; MG-ADL, MGC and QMG scales are validated, quantitated, standardized instruments of disease severity and have been acceptable endpoints for registration studies.

Descartes-08: Durable depletion of autoantibodies consistent with observed clinical responses and MoA

- All three participants with detectable AChR antibody levels at baseline experienced autoantibody reductions by Month 6
- Reductions deepened further by Month 9, and were maintained at Month 12



Cartesian THERAPEUTICS

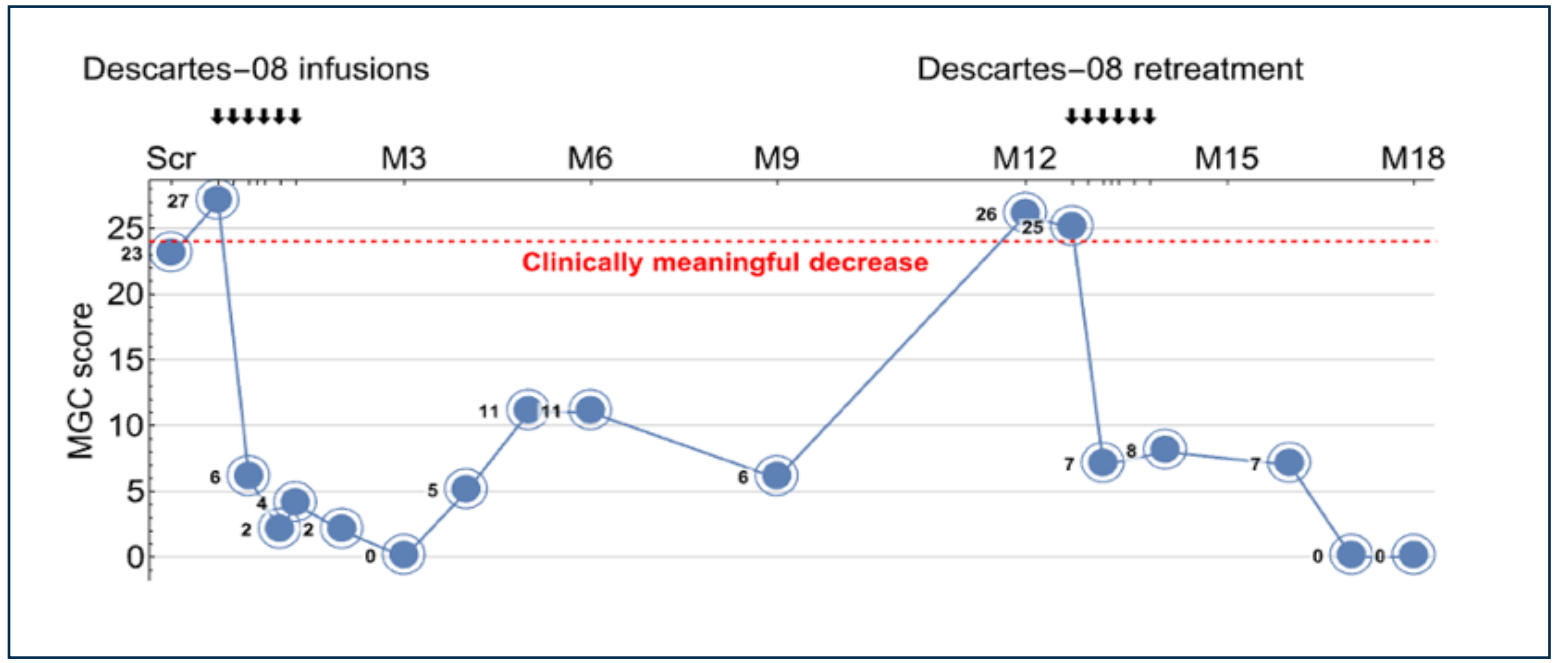
Manuscript submitted for peer review; pre-print available at medRxiv.org

Anti-acetylcholine receptor, AChR MoA, Mechanism of action

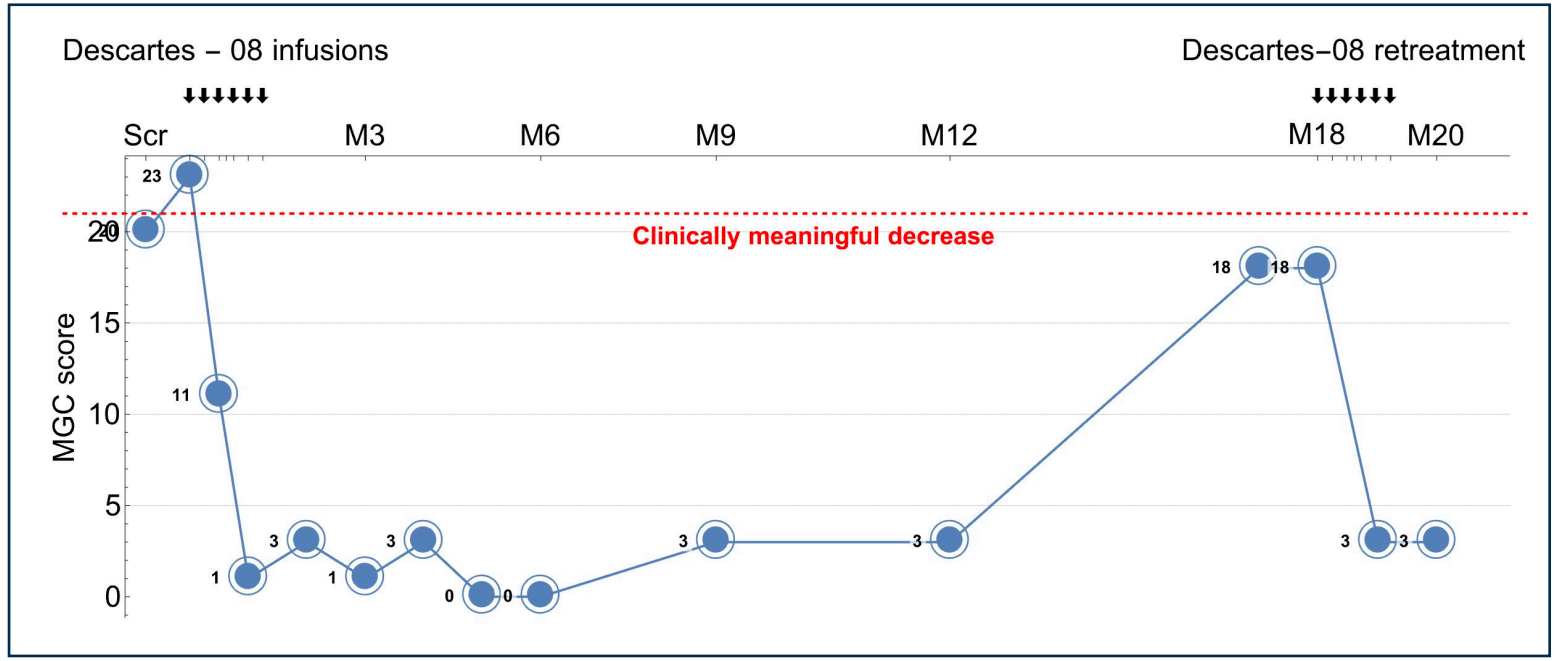
Descartes-08 retreatment led to a rapid decrease in MG-specific clinical scores

- Retreated patients experienced rapid improvement in clinical scores and minimal symptom expression

Patient 1



Patient 2



Manuscript submitted for peer review; pre-print available at medRxiv.org

Phase 2b randomized, placebo-controlled, double-masked study of Descartes-08 in MG

Plan to treat ~30 patients

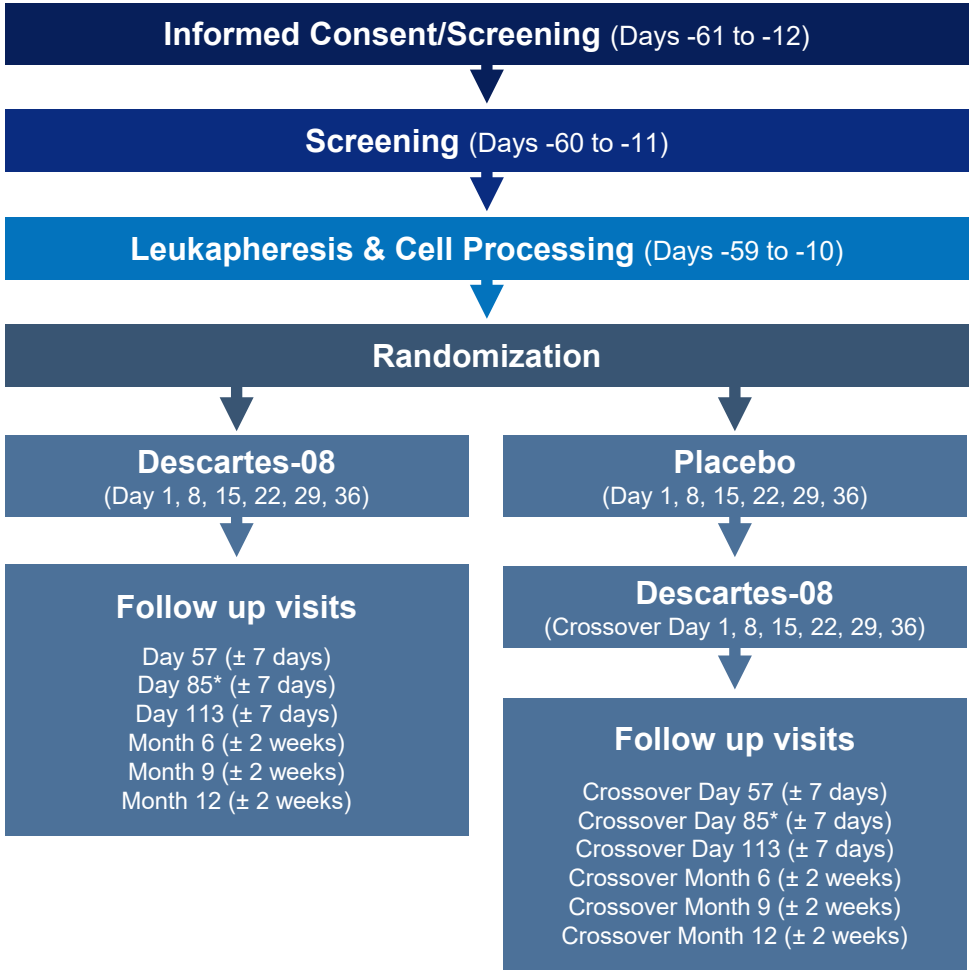
PRIMARY ENDPOINT

- Proportion of **MG Composite** responders (**≥5-point** reduction) at Day 85

SECONDARY OBJECTIVES

- Safety and tolerability
- Quantify clinical effect of Descartes-08 over 1 year
- QMG, MG QoL 15R, MG ADL, and MG PIS (change from baseline to Day 85)
- Compare effect of Descartes-08 versus placebo on MG scales (change from baseline to Day 85) in patients who cross over from placebo to Descartes-08

Enrollment underway, with top-line results expected in mid-2024



MG QMG, Quantitative MG Scores
MG QOL15R, MG Quality of Life 15-revised

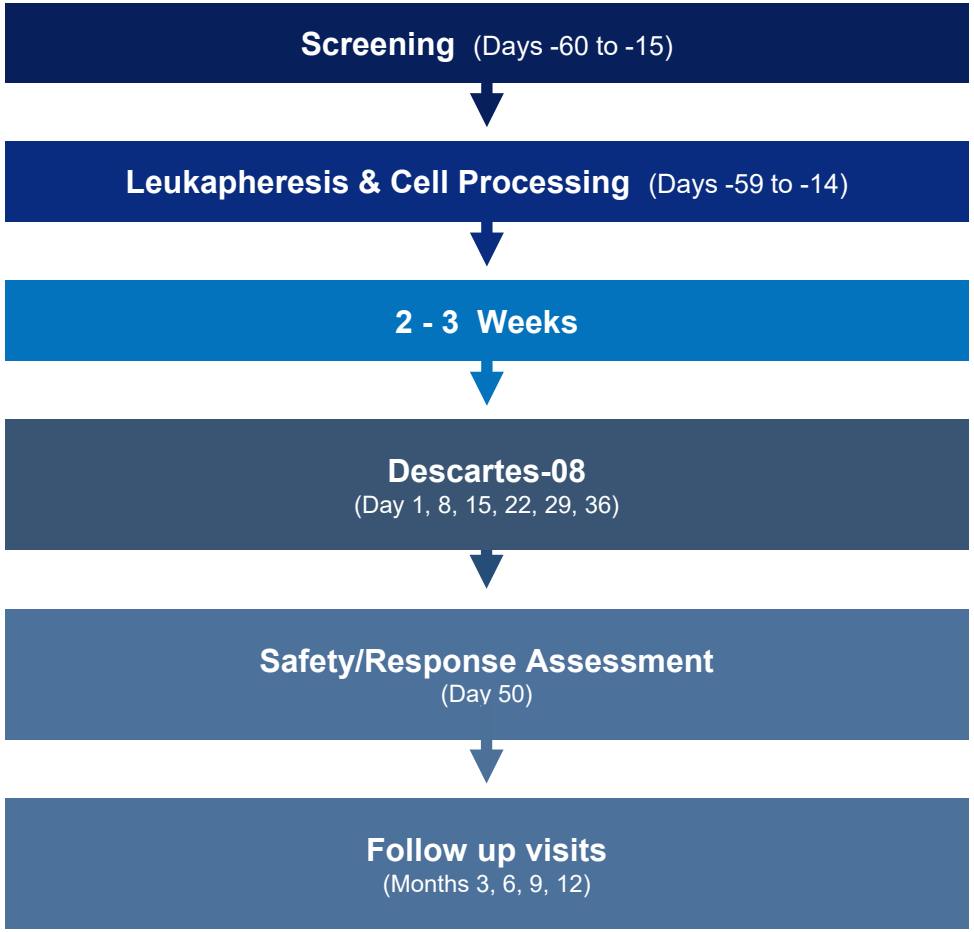
MG ADL, MG Activities of Daily Living
MG PIS, MG Post-intervention Status

Exploring potential of Descartes-08 in Systemic Lupus Erythematosus (SLE)

IND CLEARED

PHASE 2 STUDY ON TRACK FOR 1H 2024

- Open-label study in up to 30 adults with moderate to severe multi-refractory SLE and no CNS involvement
- Designed to assess safety, tolerability, and manufacturing feasibility of Descartes-08 in patients with SLE
- Secondary objectives include standard measures of clinical activity in SLE:
  - Systemic Lupus Erythematosus Disease Activity Index 2000 (SLEDAI-2K)
  - Physician Global Assessment (PGA)
  - Systemic Lupus Erythematosus Responder Index (SRI)
  - British Isles Lupus Assessment Group (BILAG)–based Composite Lupus Assessment (BICLA)



Exploring additional applications for Descartes-08 in autoantibody-associated autoimmune diseases (AAAD)

- Clinical data suggest that Descartes-08 could lead to clinical benefit along with disappearance of disease-associated autoantibodies, suggesting potential in additional autoimmune indications

Potential significant Descartes-08-associated improvement observed in a patient with autoimmune retinitis (AIR)

61-year-old man with DPPX antibody-positive AIR, colitis, encephalitis refractory to prednisone, rituximab, bortezomib, IVIg; positive for 5/5 disease-associated autoantibodies pre-treatment

Post-treatment: experienced a clinically-significant, 2-line improvement in visual acuity; 3 of 5 autoantibodies became undetectable

Test	Pre-treatment	Month 2	Month 4	Month 6
Visual acuity	20/60	20/40	20/40	20/40
Carbonic anhydrase II Ab	+	-	-	NP*
Tubulin Ab	+	-	-	NP*
PKM2 Ab	+	-	-	NP*
Aldolase Ab	+	+	+	NP*
Enolase Ab	+	+	+	NP*

*NP – not performed

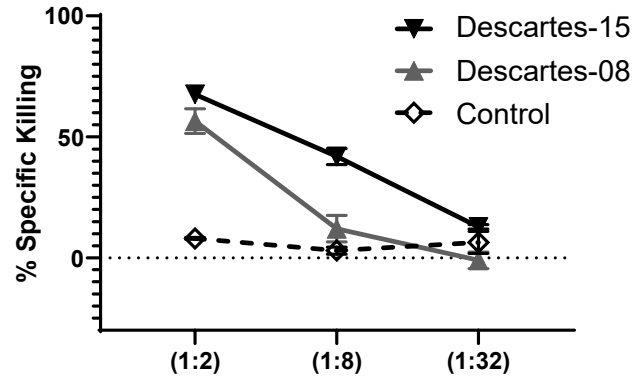
DPPX, Dipeptidyl-peptidase–like protein 6
IVIg, Intravenous immunoglobulin

RNA Armory® example: Descartes-15, a next generation anti-BCMA mRNA CAR-T with >10x potency observed in preclinical studies

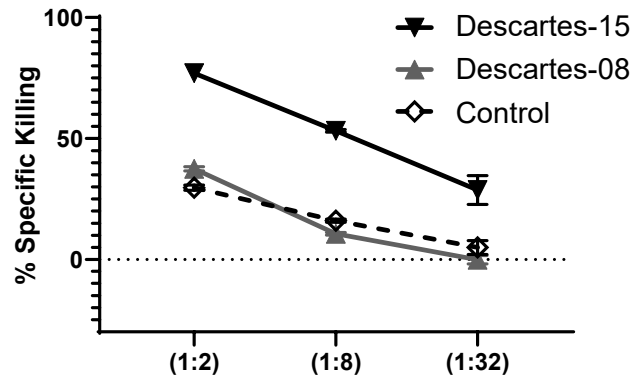
Descartes-15 is an anti-BCMA mRNA CAR-T with potential disruptive features:

- Engineered for maximum potency and CAR stability, even in the presence of target-driven suppression of CAR
- Clinical strategy expected to leverage safety and clinical activity data from Descartes-08

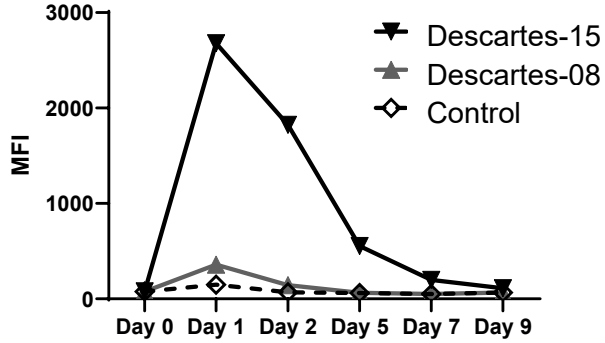
Potent killing (single target exposure)



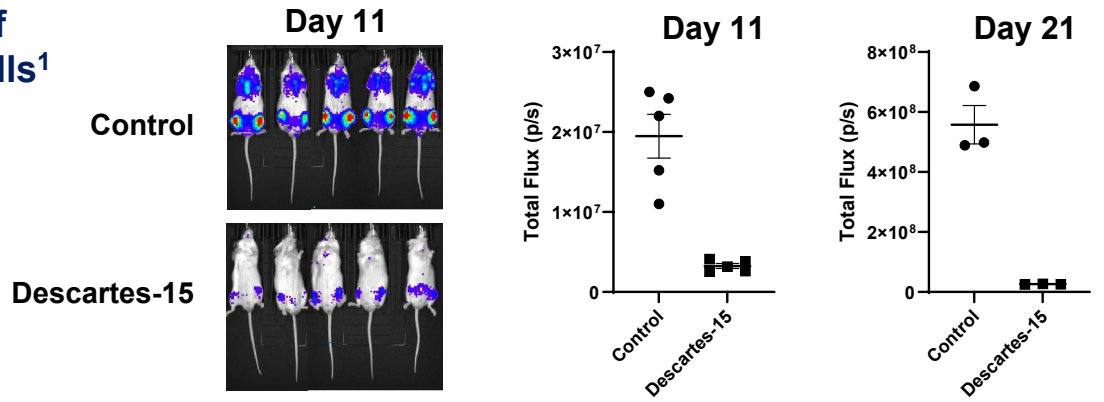
Persistent killing (multiple exposures)



Superior CAR expression

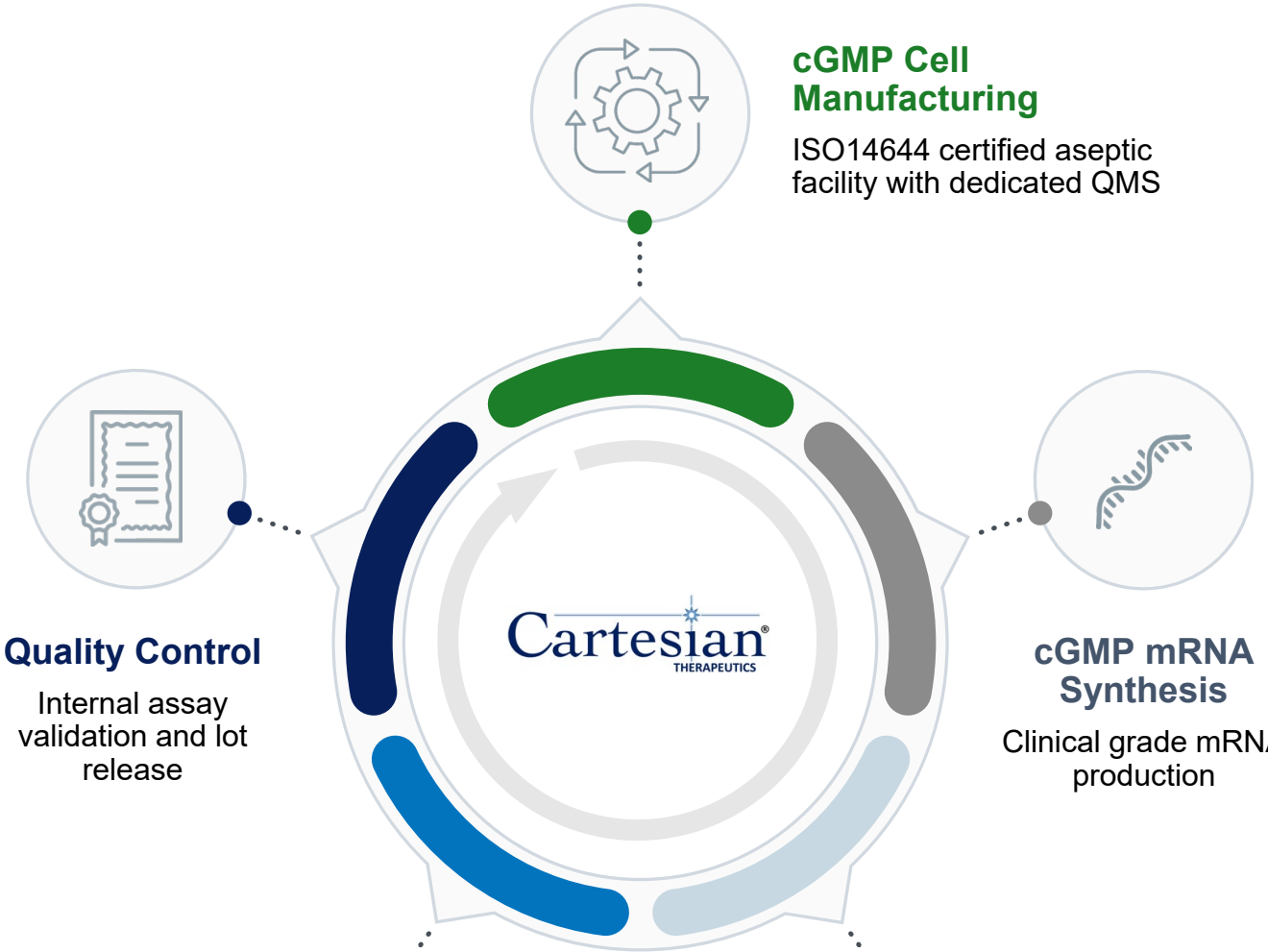


Efficient killing of BCMA+ target cells[1]



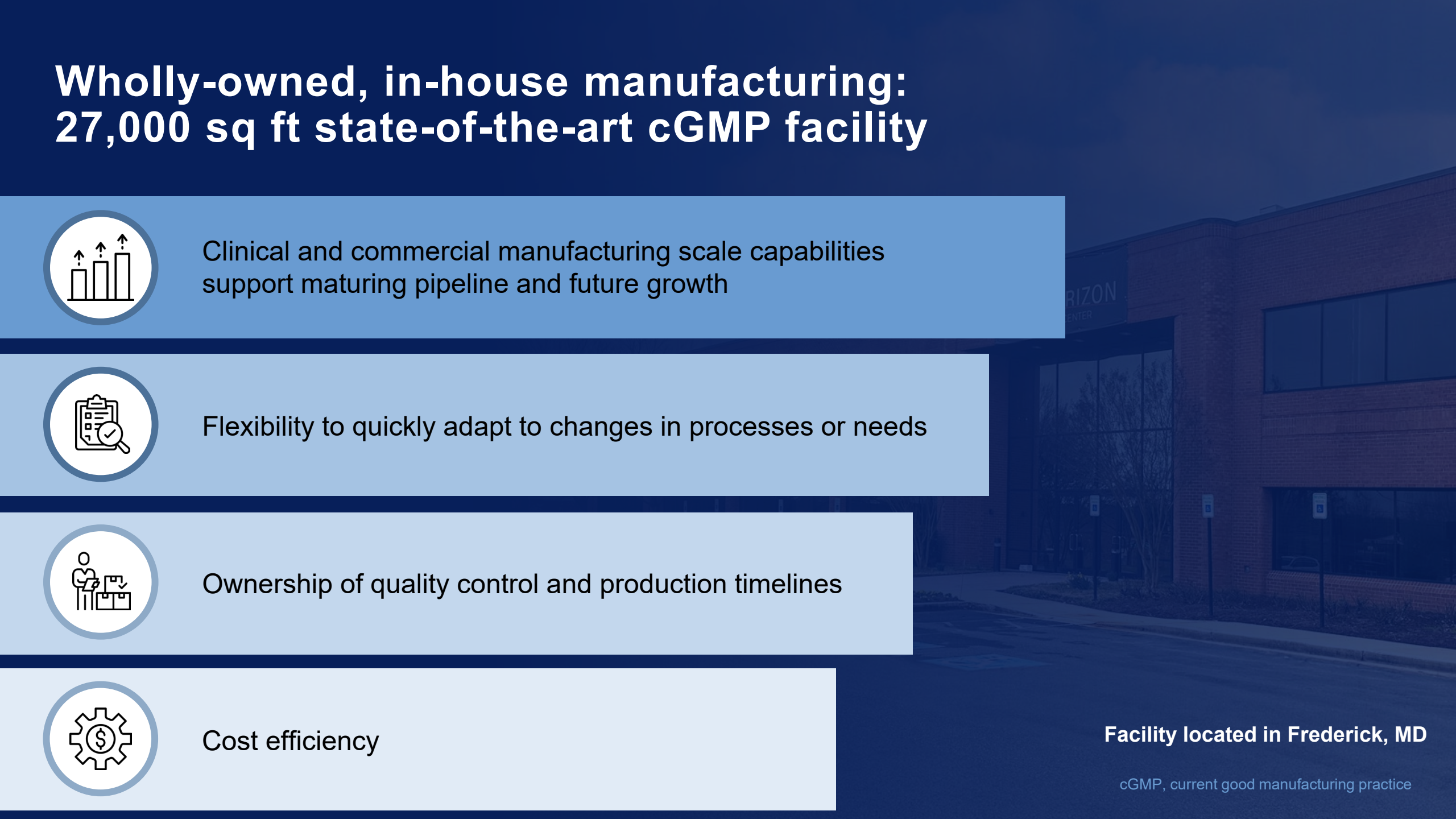
[1] MM1-S disseminated myeloma model in NSG mice infused with either control T-cells or Descartes-15

In-house manufacturing enhances control of product quality, production schedules and costs



Wholly-owned, in-house manufacturing: 27,000 sq ft state-of-the-art cGMP facility

- Clinical and commercial manufacturing scale capabilities support maturing pipeline and future growth
- Flexibility to quickly adapt to changes in processes or needs
- Ownership of quality control and production timelines
- Cost efficiency



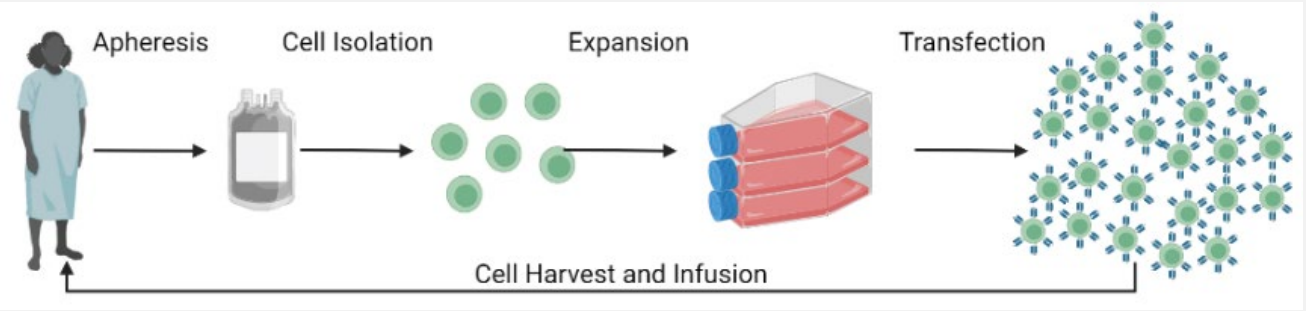
Facility located in Frederick, MD

cGMP, current good manufacturing practice

Platform offers potential development opportunities via three modalities: autologous, allogeneic and *in situ*

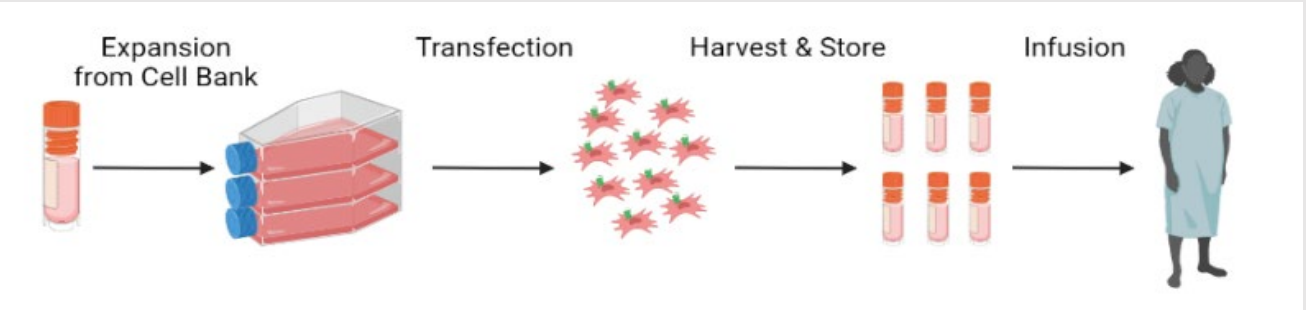
Autologous mRNA CAR-T

- Descartes-08
- Descartes-15: next generation anti-BCMA mRNA CAR-T with >10x potency observed in clinical studies



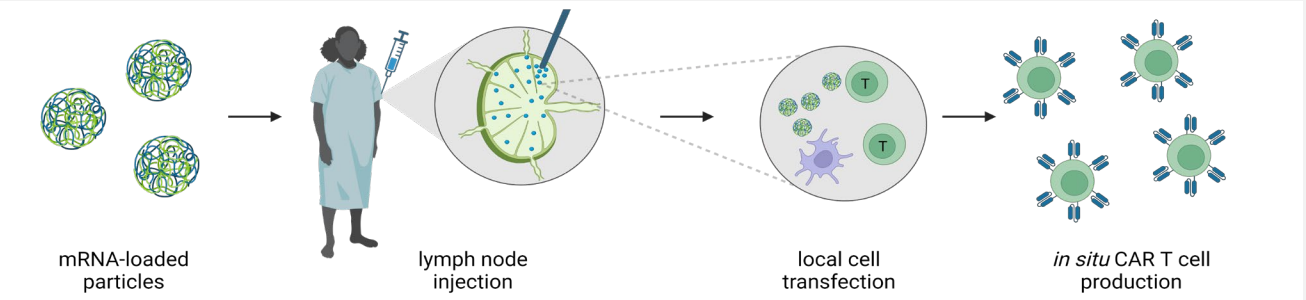
Allogeneic mRNA MSC

- Descartes-33



rLN: *In situ* lymph node transfection

- Undisclosed program



Maturing pipeline offers potential for multiple catalysts

Descartes-08 in MG

Expect to report Phase 2b data mid-2024

Mid 2024

Descartes-08 in SLE

Plan to initiate Phase 2 in 1H 2024

1H 2024

Descartes-08 Additional Indications

Plan to initiate basket studies in additional autoimmune indications in 2H 2024

2H 2024

Descartes-15

IND cleared, with first-in-human Phase 1 planning activities underway

2024

Funding expected to support development of Descartes-08 through Phase 3 and advance additional programs

Strong Financial Position Expected to Support Pipeline Through Key Milestones

$104.8M
Cash as of 3/31/24

2H 2026
Anticipated cash runway into

<60 EMPLOYEES
Based in Gaithersburg, MD

17.8M
Basic shares outstanding

23.3M
Basic shares outstanding upon full conversion of outstanding Series A Preferred*

26.6M
Fully diluted shares outstanding**

*Shares include approximately 166.3 thousand shares of Series A Non-Voting Convertible Preferred Stock that remain subject to beneficial ownership limitations that are convertible into approximately 5.5 million shares of common stock.

**Fully diluted shares include diluted shares as described above, as well as outstanding options, RSUs and warrants.

Cartesian® THERAPEUTICS

PIONEERING mRNA CELL THERAPIES

Pipeline designed to expand the reach of cell therapy to autoimmunity

MATURING PIPELINE WITH EXPECTED NEAR-TERM CATALYSTS

Validated lead program, Descartes-08, with Phase 2b data expected mid-year

CASH RESOURCES EXPECTED TO FUND OPERATIONS INTO 2H 2026

Expected to support Descartes-08 through Phase 3 and advance additional programs

EXPERIENCED LEADERSHIP TEAM

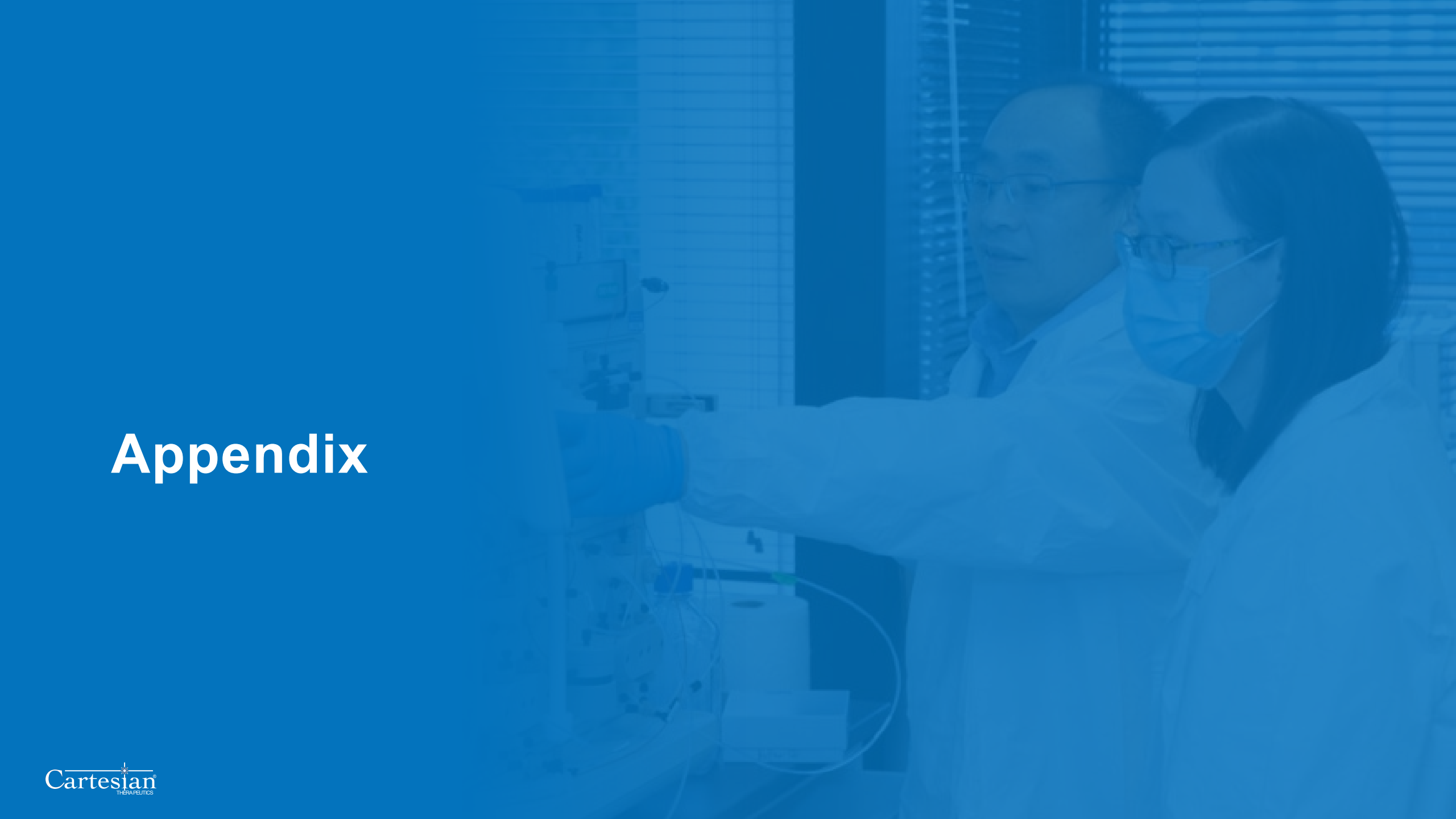
Focused on disciplined investment and creating value for stockholders and patients

Cartesian® THERAPEUTICS

CARTESIAN THERAPEUTICS

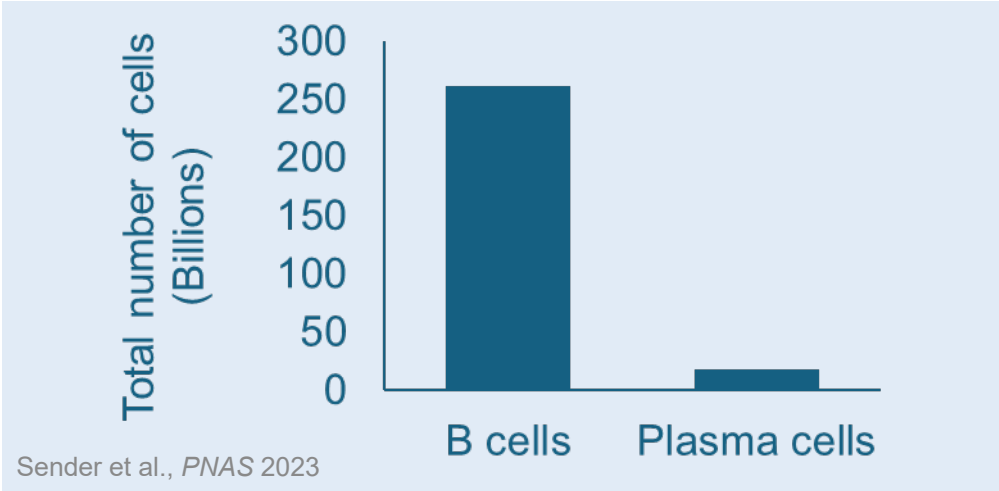
Pioneering mRNA Cell Therapy for Autoimmunity

Appendix

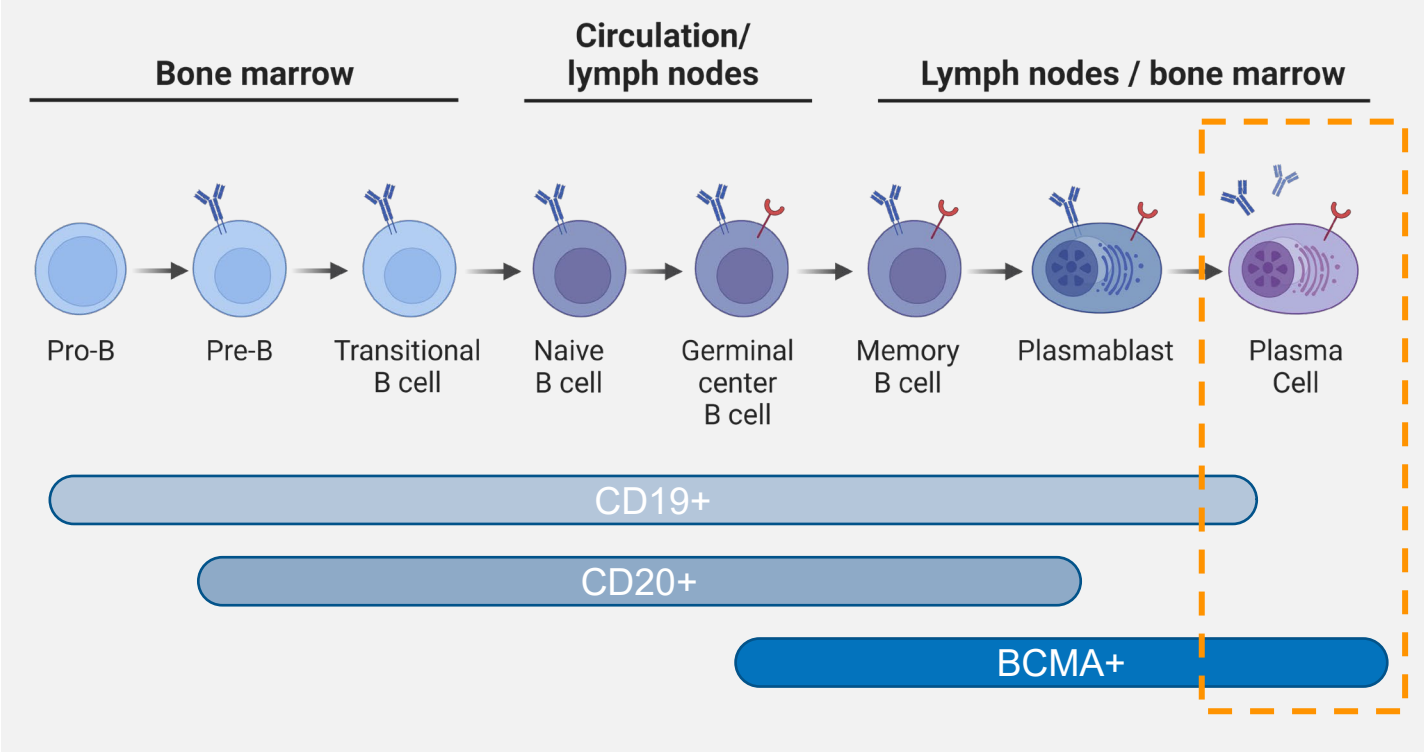


Differentially expressed B-cell antigens require distinct CAR-T strategies

- CD19+ and CD20+ cells represent the vast majority of B cells and are ubiquitously distributed
- CD19+ and CD20+ are often expressed on the same B cells
- The exceptions are plasma cells, in which neither antigen is expressed, and plasmablasts, in which CD19+ is expressed, directly responsible for pathogenic autoantibodies
- Plasma cells are rare and tissue-restricted



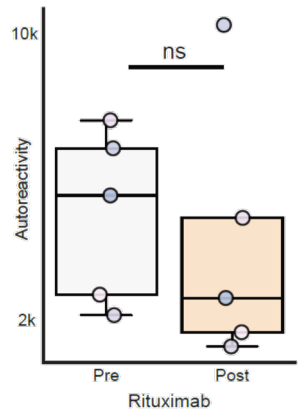
Sender et al., *PNAS* 2023



BCMA is a differentiated target with potential for precision CAR-T in patients with autoimmunity

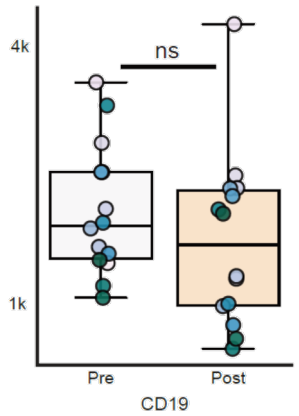
Clinical analyses of antigen-depletion therapies show BCMA-targeting with CAR-T may enable precision reset of autoantibody-producing PCs

Rituximab
(CD20+ cell depletion)



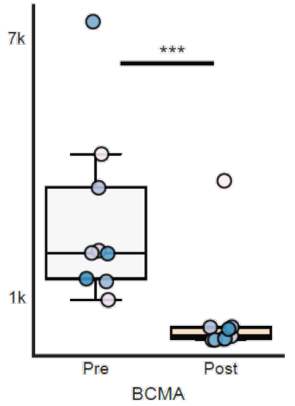
Minimal change in autoreactivity

Anti-CD19 CAR-T
(CD19+ cell depletion)



Minimal change in autoreactivity

Anti-BCMA CAR-T
(BCMA+ cell depletion)



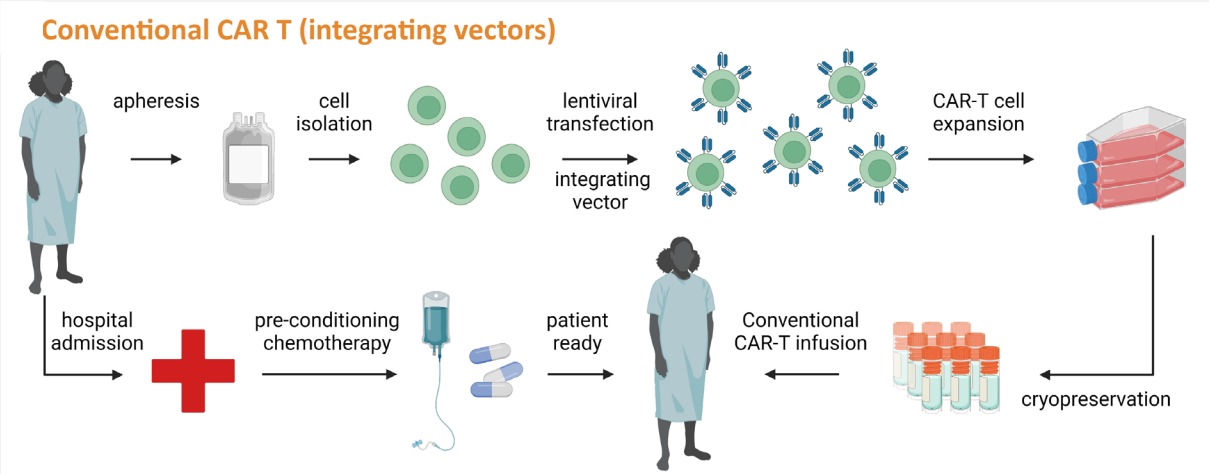
Nearly full reset of autoreactivity

Bodansky et al., doi: 10.1101/2023.12.19.23300188

Cartesian differentiation: All approved CAR T therapies and other trials in the autoimmune space face fundamental hurdles created by integrating vectors

Conventional CAR-T (integrating viral vectors) targeting CD19

- Creates significant burden for patients in three areas
  - hospital admission
  - lymphodepletion/chemotherapy
  - cytokine release syndrome (CRS) risk
- Patients with autoimmunity typically have much lower tolerance for these hurdles relative to cancer patients



mRNA CAR T (no integration) targeting BCMA

- mRNA enables transient expression → no need for significant T cell proliferation
- Eliminates lymphodepletion and enables outpatient administration without CRS