Bringing cell therapy to patients outside oncology

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Cell & Gene Therapy Innovation Summit
February 8, 2024 (Barcelona)

Disclosures

- CM Jewell is employed by and holds an equity position with Cartesian Therapeutics
- CM Jewell is an Associate Editor at Nature Regenerative Medicine and receives compensation
- CM Jewell holds an equity position with Barinthus Biotherapeutics
- CM Jewell is the Minta Martin Professor and the MPower Professor at the University of Maryland – College Park
- CM Jewell is a Research Biologist with the Baltimore VA Medical Center
- The views presented here do not reflect the views of the University of Maryland or the United States government

Clinical-stage company pioneering mRNA cell therapies for autoimmunity

- Pipeline for reliably and safely dosing cell therapy in outpatient setting without lymphodepletion using RNA to achieve *transient* CAR expression
- Descartes-08: mRNA CAR T-cell therapy showing deep and durable responses during Phase 2a study in patients with myasthenia gravis (MG)
- Wholly-owned GMP manufacturing to enable rapid process optimization

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

Pro forma cash resources*

$118M (as of end of 2023) expected to fund operations into 2H26

- Clinical development of Descartes-08 through Phase 3
- Development of multiple additional clinical programs

*Reflects the anticipated receipt of $40M through two delayed settlement payments previously announced as part of the November 2023 financing, which are expected in January 2024 and February 2024
CAR, Chimeric antigen receptor
SLE, Systemic Lupus Erythematosus

Cartesian® THERAPEUTICS

Experienced management team for bringing cell therapy to autoimmunity

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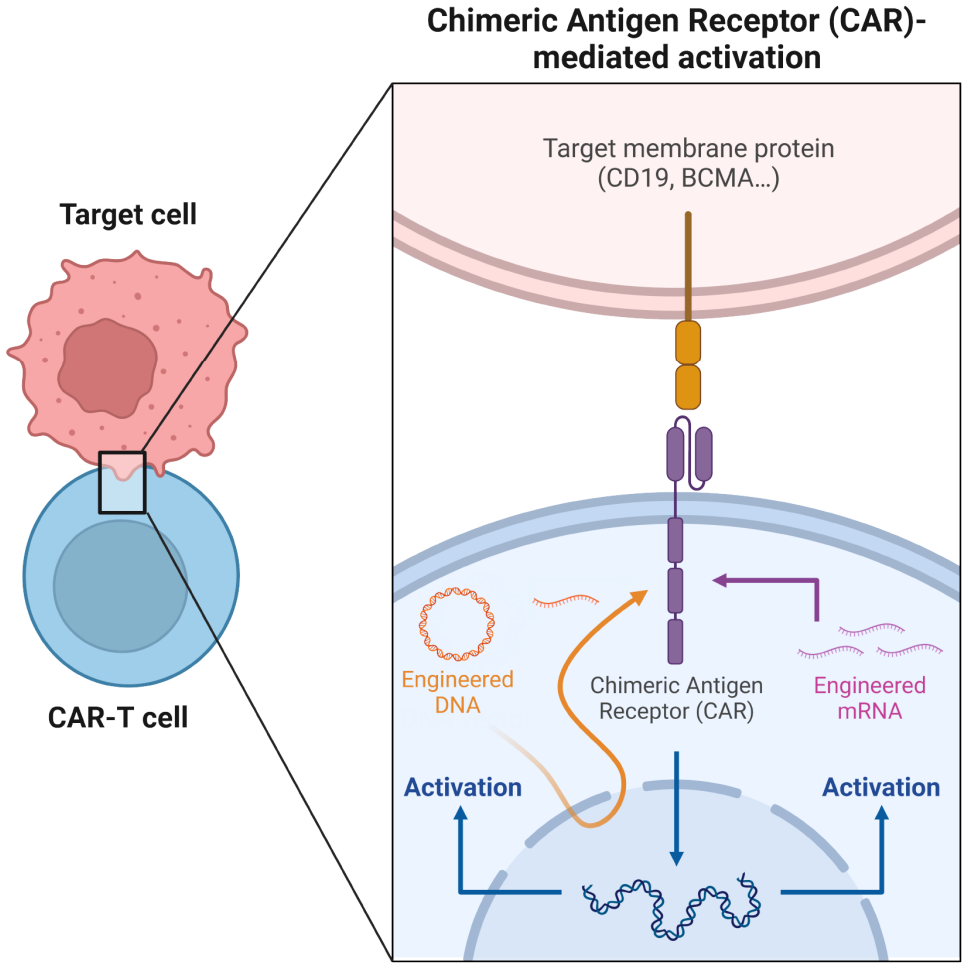
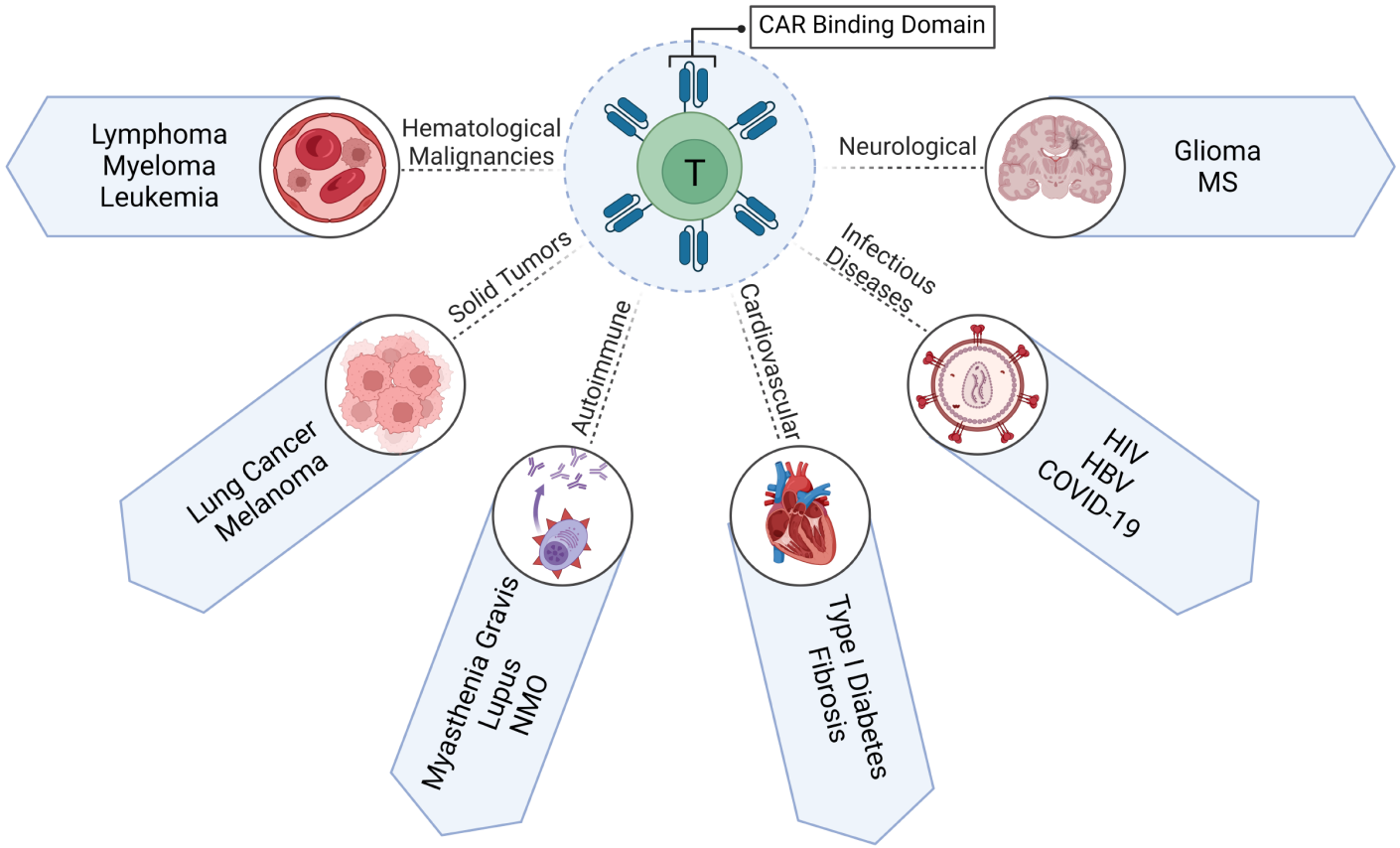
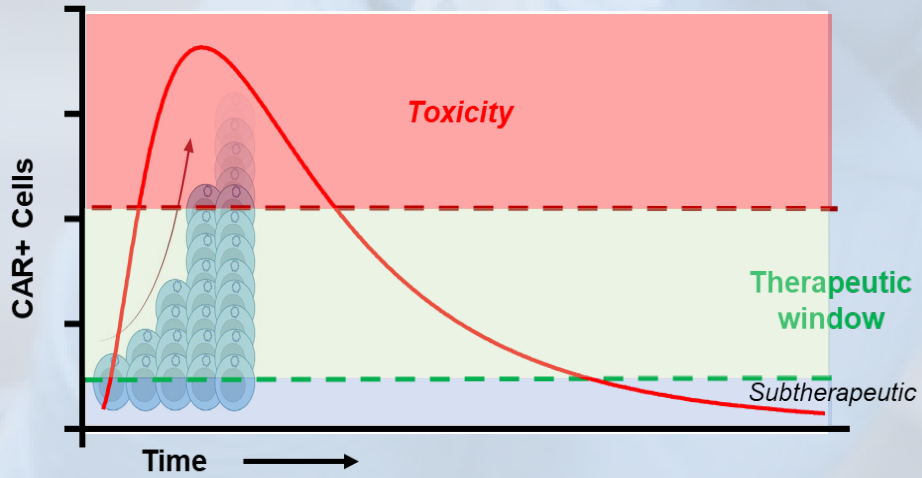
The selectivity of chimeric antigen-specific (CAR) T cell therapy offers transformative potential for diverse indications beyond oncology





Conventional engineered cell therapy uses DNA, which can lead to toxicity and increased patient burden

- Effector function of cell therapy engineered with DNA amplifies exponentially with cell replication and can lead to uncontrollable PK/PD
- Cells administered at subtherapeutic levels can quickly proliferate into therapeutic window and beyond



DNA transduced CAR-T can lead to:

- Cytokine release syndrome (CRS)
- Neurotoxicity and parkinsonism
- Cytopenia (from pre-treatment chemo)
- Infections
- Secondary malignancies
- Death

Patient experience:

- Patients receiving DNA CAR-T require inpatient administration and pre-treatment chemotherapy (lymphodepletion)
- Indirect costs high due to monitoring/treatment of toxicities

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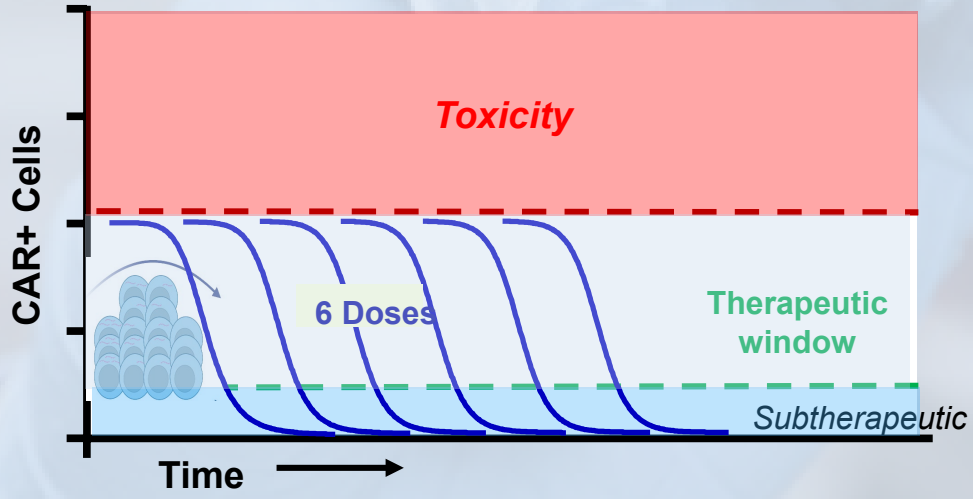
Cartesian's mRNA approach is designed to expand the reach of cell therapy to autoimmune indications

- mRNA does not replicate → predictable half-life with more controllable PK/PD defined by the dose
- No requirement for cell proliferation → no expected need for pre-treatment chemotherapy → no Grade 3-4 cytopenias



Expectation for cells to be administered at the therapeutic but sub-toxic doses

Descartes-08 has been administered to 66 patients with autoimmune diseases and cancer[1] with no CRS, neurotoxicity, or infections observed

Ability to treat in outpatient setting offers potential to be administered in community clinics

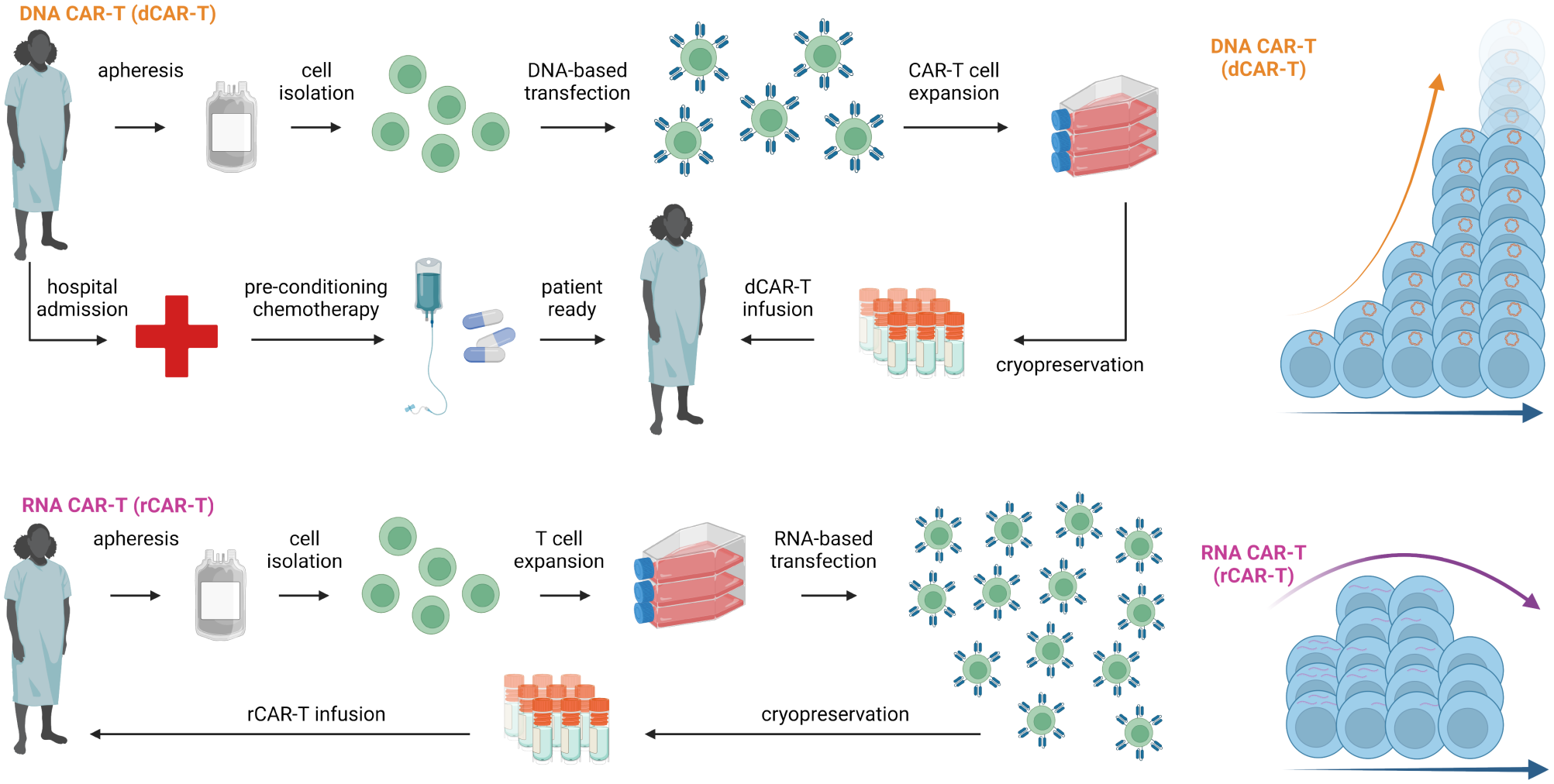
Potential for safe re-dosing

mRNA CAR-Ts have potential to overcome challenges of DNA CAR-Ts

- No expected need for hospitalization, lymphodepletion, toxicity management, and monitoring
- Produces multiple cycles from one apheresis
- Lower manufacturing costs

[1]All open-label patients treated with Descartes-08 as of Oct 30, 2023

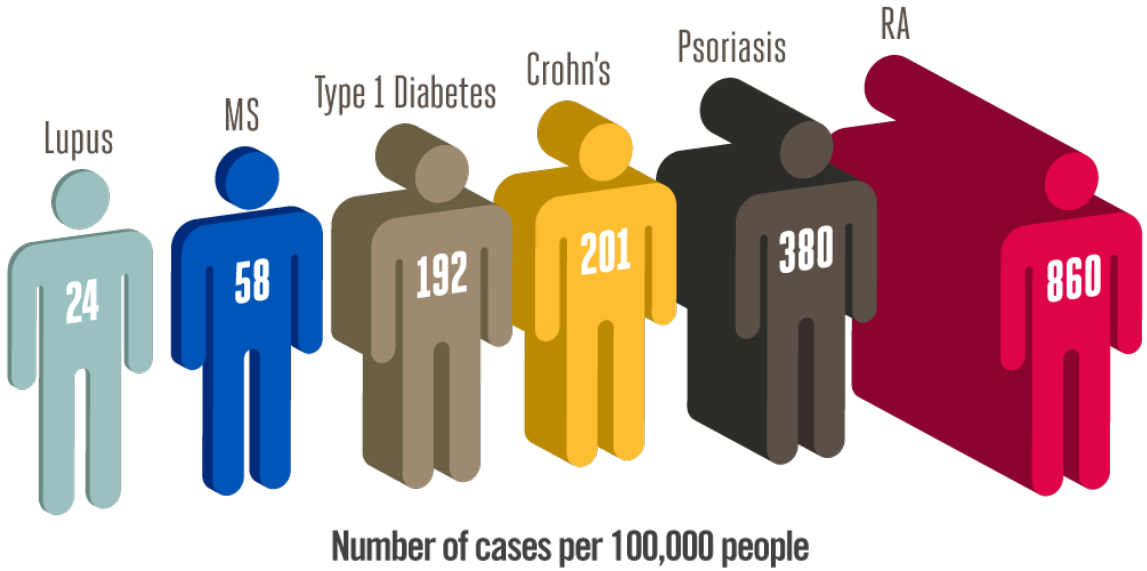
DNA-based or RNA-based CAR-T produce distinct patient experiences



Autoimmune and inflammatory diseases impact 200M+ people

- **Diverse pathologies but common features**
  - Autoimmunity - characterized by attack against self
  - 100+ autoimmune disorders
  - Many poorly defined
  - Other relevant disease classes (e.g., inflammatory disease, allergies)

- **Persistent treatment challenges:**
  - No cures
    → varying severities and co-morbidities
  - Require life long treatment
    → often poor compliance and patient QOL
  - Multi-faceted side effects



Source: NIH.gov, National MS Society, RheumatoidArthritis.net, Organdonor.gov, NIH.gov

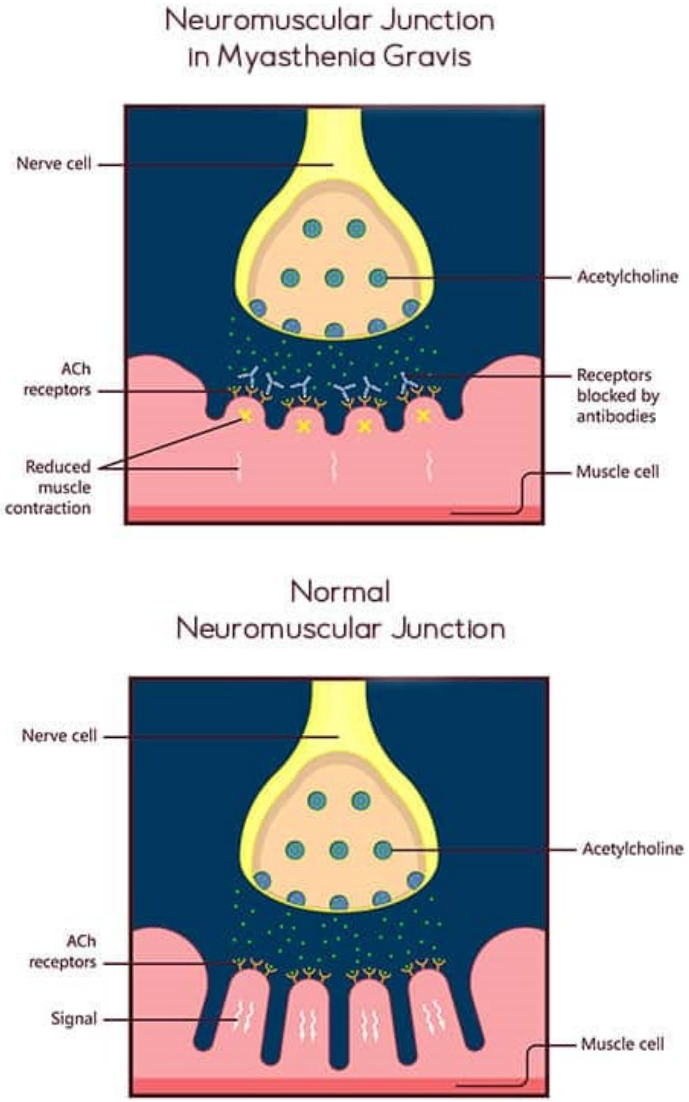
Wholly-owned pipeline targets autoimmune disease

Asset	Indications	Discovery/Preclinical	Phase 1	Phase 2	Pivotal
Descartes-08 Autologous mRNA CAR-T	Myasthenia Gravis	**Data from Phase 2b study expected in mid-2024**			
	SLE, other AAAD	**Expect to initiate Phase 2 studies in SLE and additional autoimmune indications in 2024**			
Descartes-15 Autologous mRNA CAR-T	AAAD	**Next-gen anti-BCMA mRNA CAR-T with >10x preclinical potency**			
Descartes-33 Allogeneic mRNA MSC	AAAD				
***In situ* LN transfection**	Undisclosed				

AAAD, autoantibody-associated autoimmune diseases
mRNA MSC, Mesenchymal Stem Cells transfected with mRNA
BCMA, B-cell maturation antigen
SLE, Systemic Lupus Erythematosus
LN, Lymph node

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



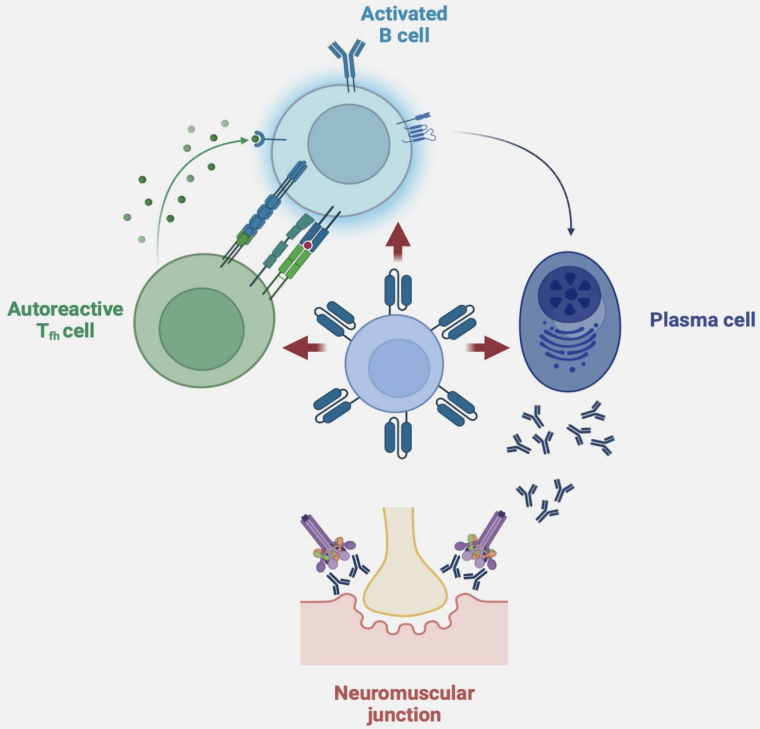
Descartes-08 is believed to be the first mRNA CAR-T in clinical development for autoimmune disease

Engineered by transfection of autologous CD8+ T cells with mRNA encoding anti-BCMA CAR

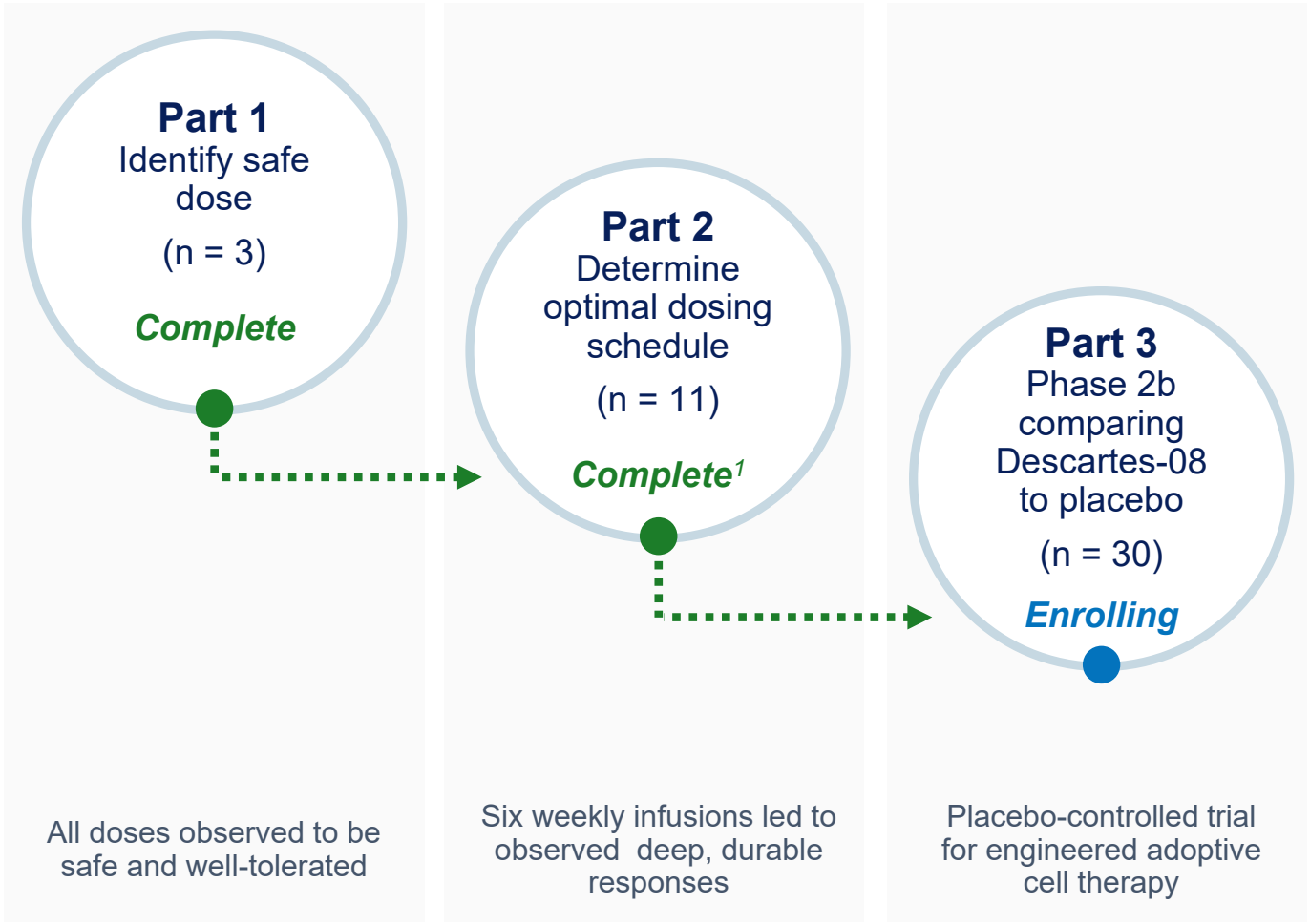
Typical lot **processed for infusion within ~3 weeks**

Positive Phase 2a data in myasthenia gravis underscores potential for deep and durable responses

Granted **U.S. FDA orphan designation** for generalized myasthenia gravis



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

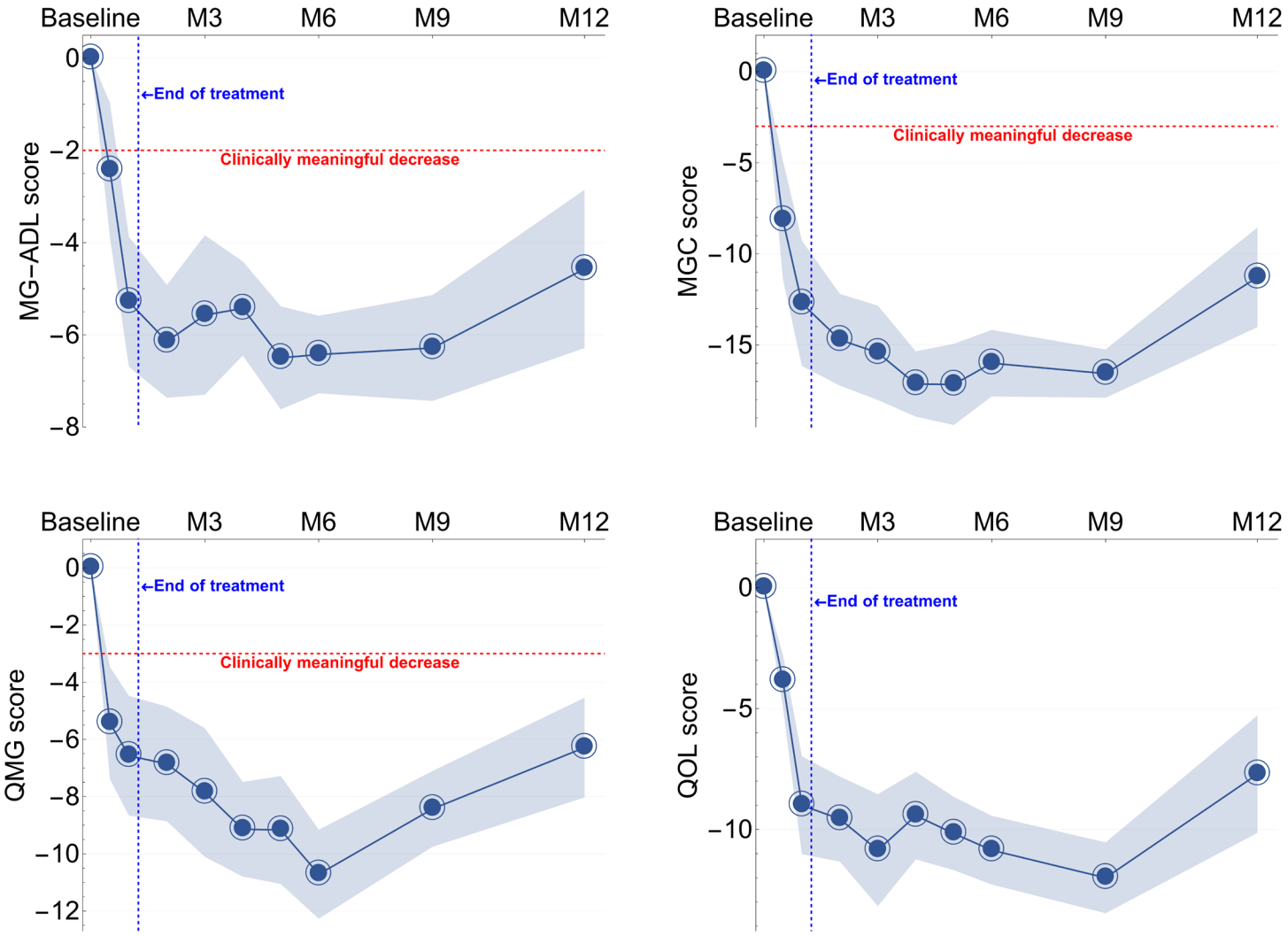
*There were no adverse events of grade 3 or higher reported in part 1, and no grade 2 or grade 4 events reported in part 2, where grade 1 is mild, grade 2 is moderate, grade 3 is severe, and grade 4 is life-threatening.

[1]Not associated with hypoxia

Cartesian THERAPEUTICS

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

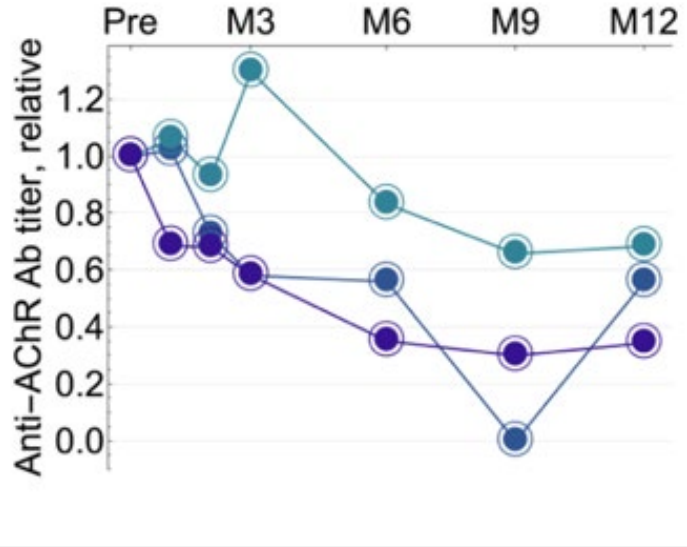
- **Notable magnitude and duration of response** across all 4 standard MG severity scales
- Responses appear **to *deepen after completing treatment*** at Week 6
- **Positive** twelve-month follow-up data from Phase 2a study reinforce prior findings published in *Lancet Neurology*



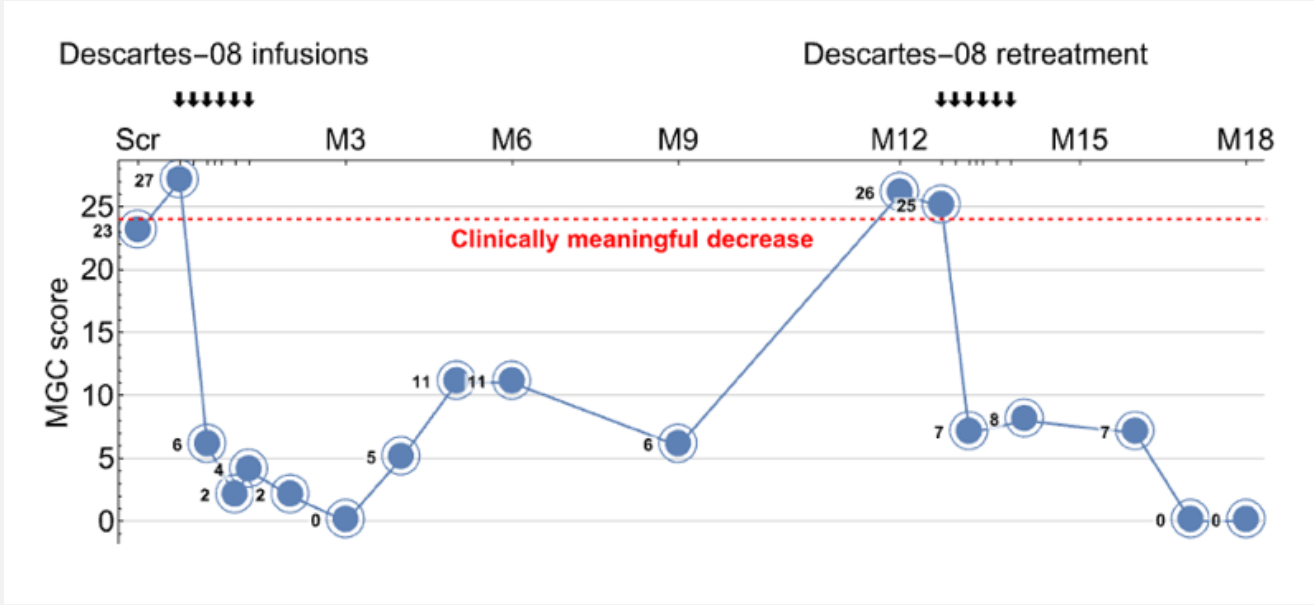
Manuscript submitted for peer review; pre-print available at medRxiv.org
Efficacy dataset includes all MG patients completing the 6-dose once-weekly regimen (n=7). Data are mean score improvement (point) and standard error (light blue shading). Note that QOL scale does not have an agreed-upon threshold 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 demonstrated durable depletion of autoantibodies and retreatment potential in MG

Lasting reductions in autoantibody titers[1] are consistent with the observed clinical responses and mechanism of action



Retreated patient experienced rapid improvement in clinical scores after retreatment, which was ongoing with minimal symptom expression at month 6 follow-up



[1] Data series represent all patients who exhibited detectable anti-AChR antibody at baseline and received once-weekly dosing

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

Plan to treat ~30 patients

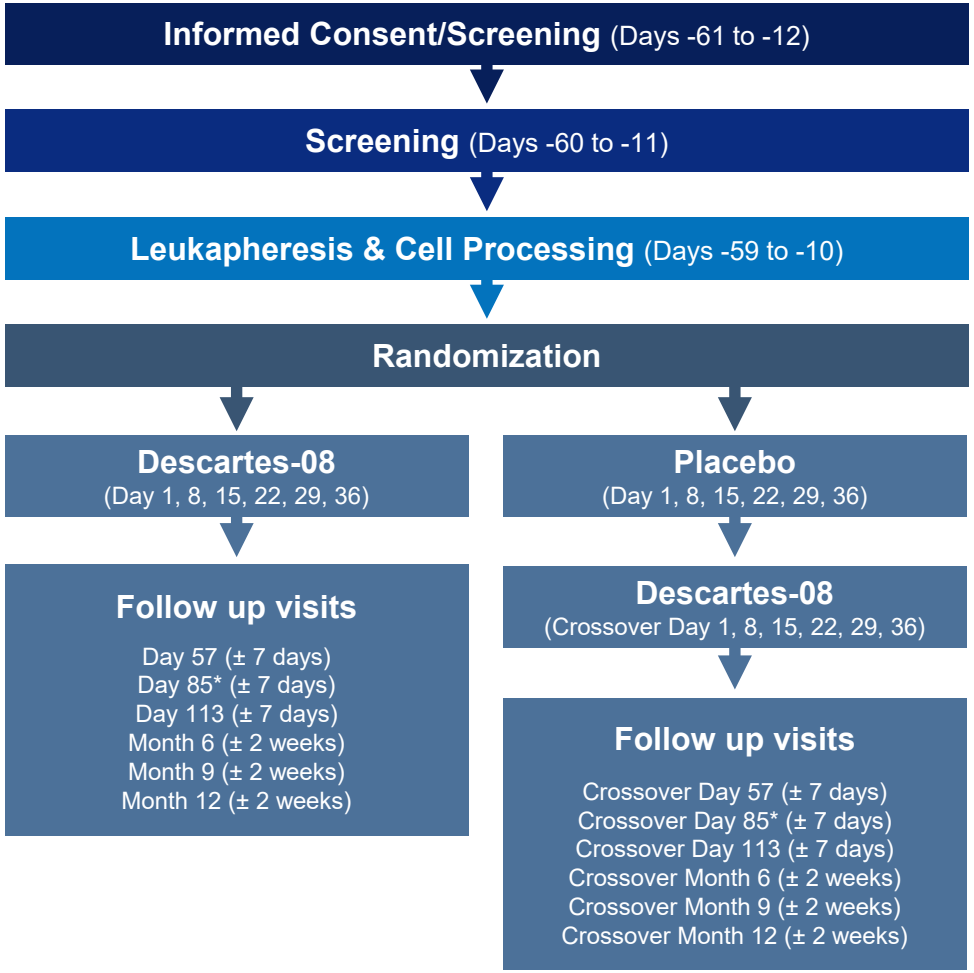
PRIMARY ENDPOINT

- 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

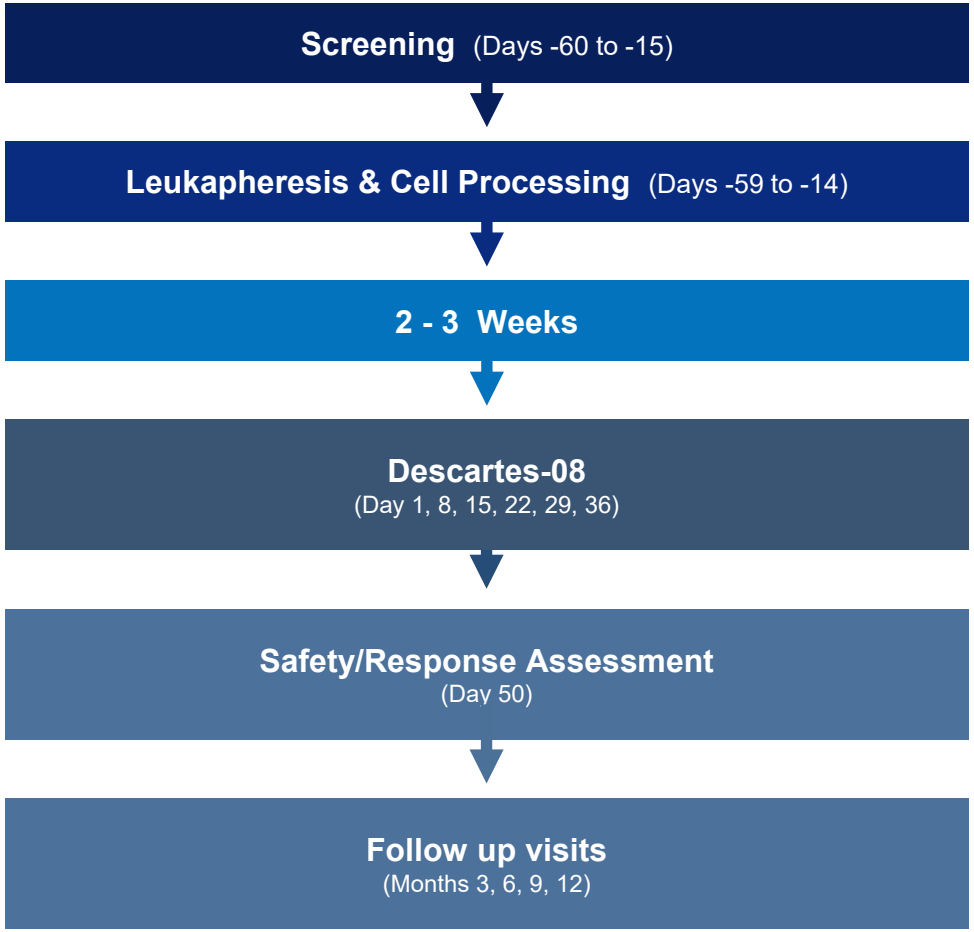
MG ADL, MG Activities of Daily Living
MG PIS, MG Post-intervention Status

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 Descartes-08 could lead to clinical benefit and with disappearance of disease-associated autoantibodies
- Indicates potential for expansion to 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

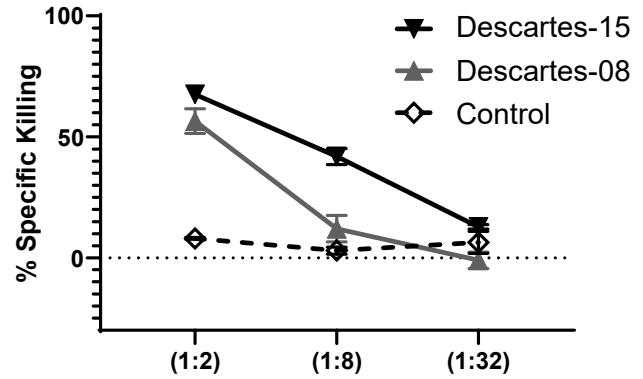
DPPX, , Dipeptidyl-peptidase–like protein 6
IVIg, Intravenous immunoglobulin

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

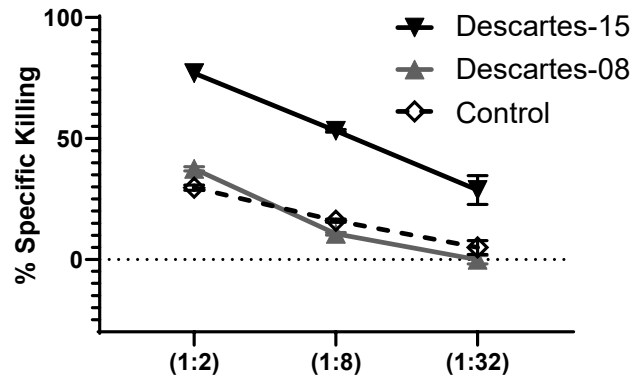
Descartes-15 is an anti-BCMA mRNA CAR-T with potential disruptive features:

- 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

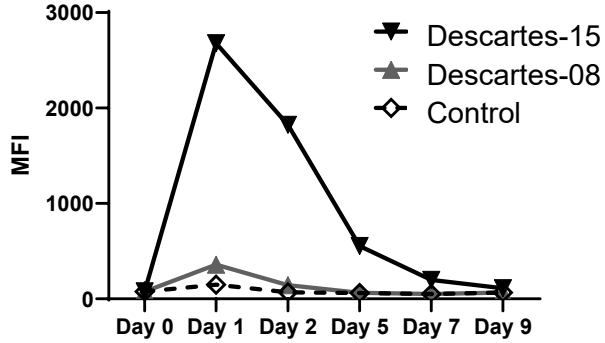
Potent killing (single target exposure)



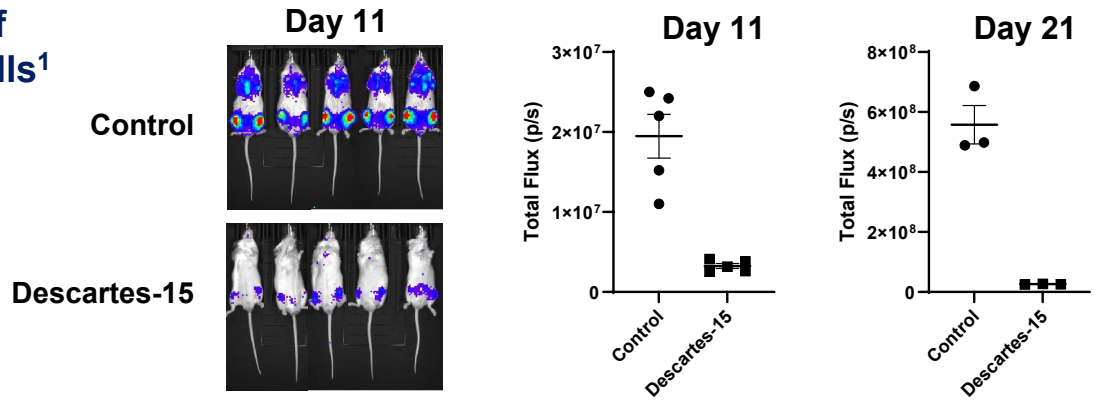
Persistent killing (multiple exposures)



Superior CAR expression

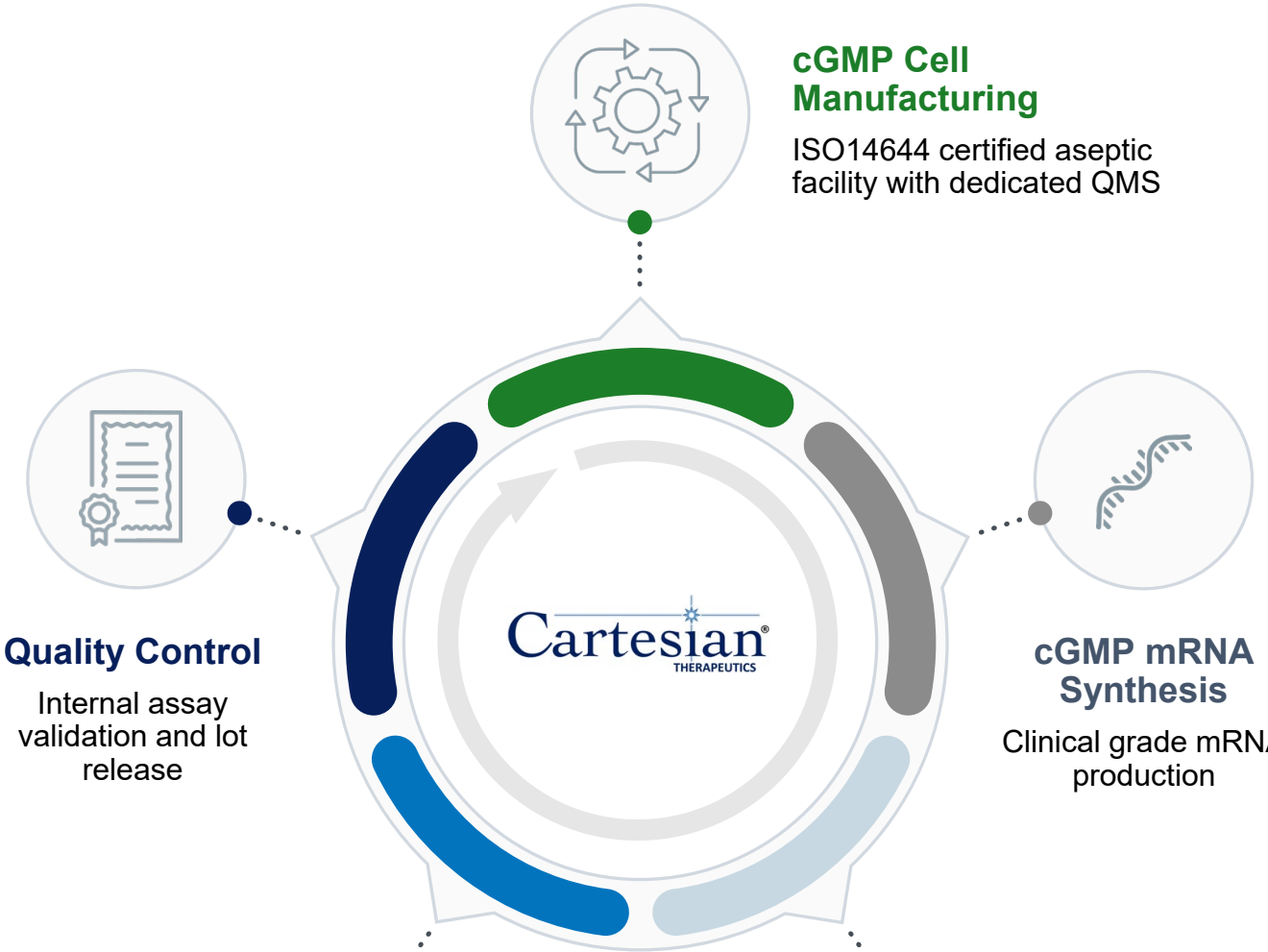


Efficient killing of BCMA+ target cells[1]



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

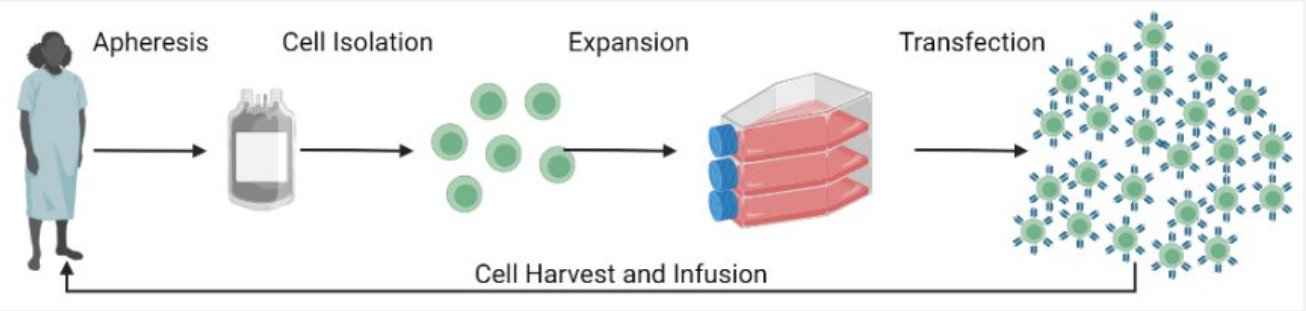
In-house manufacturing enhances control of product quality, production schedules and costs



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

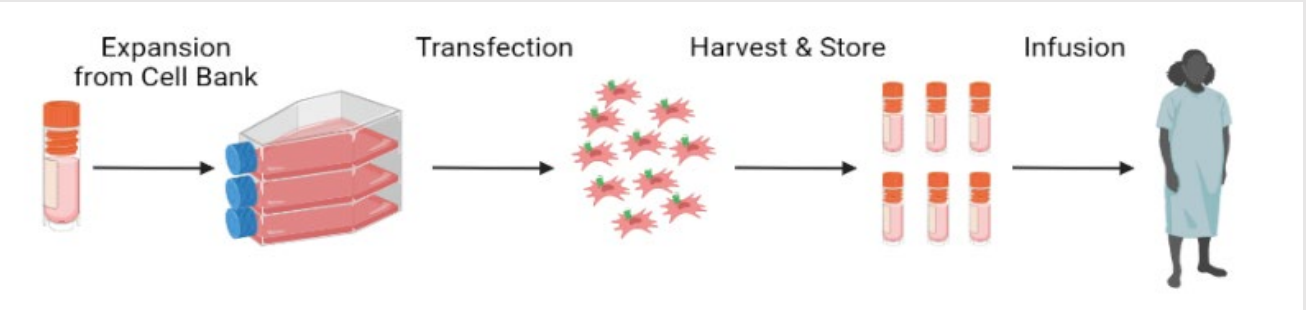
Autologous mRNA CAR-T

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



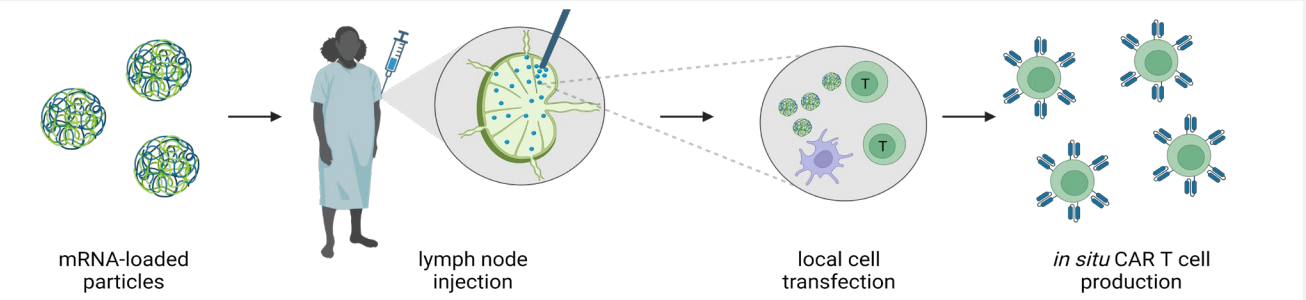
Allogeneic mRNA MSC

- 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

~$118M

Pro forma cash as of 12/31/23*

162M common

696M basic**

Shares outstanding as of 12/31/23

Anticipated cash runway into

2H 2026

<50 employees

Based in Gaithersburg, MD

*Reflects the anticipated receipt of $40M through two delayed settlement payments previously announced as part of the November 2023 financing, which are expected in January 2024 and February 2024
**Reflects 534,261 shares of Series A Non-Voting Convertible Preferred stock outstanding, which are convertible into approximately 534.3 million shares of common stock.

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