Cartesian therapeutics

Pioneering mRNA Cell Therapy for Autoimmunity

November 2024

Forward-Looking Statements

Disclosures

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Any statements in this presentation about the future expectations, plans and prospects of the Company, including without limitation, statements regarding the Company's expected cash resources and cash runway, the Company's pro forma cash resources, conversion of the Company's remaining Series B Non-Voting Convertible Preferred Stock and remaining Series A Non-Voting Convertible Preferred Stock, the ability of Descartes-08 or Descartes-15 to be administered in an outpatient setting or without the need for preconditioning lymphodepleting chemotherapy, the Company's in-house manufacturing capabilities, the potential of the Company's technology to enable precision control and optimization of engineered cells for diverse cell therapies leveraging multiple modalities, the potential of Descartes-08, Descartes-15, or any of the Company's other product candidates to treat myasthenia gravis, systemic lupus erythematosus, juvenile myasthenia gravis, juvenile systemic lupus erythematosus, juvenile dermatomyositis, multiple myeloma, or any other disease, the anticipated timing or the outcome of ongoing and planned clinical trials, studies and data readouts, the anticipated timing or the outcome of the FDA's review of the Company's regulatory filings, the Company's ability to conduct its clinical trials and preclinical studies, the timing or making of any regulatory filings, the anticipated timing or outcome of selection of developmental product candidates, the ability of the Company to consummate any expected agreements and licenses and to realize the anticipated benefits thereof, the novelty of treatment paradigms that the Company is able to develop, the potential of any therapies developed by the Company to fulfill unmet medical needs, the Company's ability to enter into and maintain its strategic partnerships, enrollment in the Company's clinical trials and other statements containing the words "anticipate," "believe," "continue," "could," "estimate," "expect," "hypothesize," "intend," "may," "plan," "potential," "predict," "project," "should," "target," "would," and similar expressions, constitute forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995. Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors, including, but not limited to, the following: the uncertainties inherent in the initiation, completion and cost of clinical trials (including proof of concept trials), including uncertain outcomes, the availability and timing of data from ongoing and future clinical trials and the results of such trials, whether preliminary results from a particular clinical trial will be predictive of the final results of that trial and whether results of early clinical trials will be indicative of the results of later clinical trials, the ability to predict results of studies performed on human beings based on results of studies performed on non-human subjects, the unproven approach of the Company's RNA Armory® technology, potential delays in enrollment of patients, undesirable side effects of the Company's product candidates, its reliance on third parties to conduct its clinical trials, the Company's inability to maintain its existing or future collaborations, licenses or contractual relationships, its inability to protect its proprietary technology and intellectual property, potential delays in regulatory approvals, the availability of funding sufficient for its foreseeable and unforeseeable operating expenses and capital expenditure requirements, the Company's recurring losses from operations and negative cash flows, substantial fluctuation in the price of the Company's common stock, risks related to geopolitical conflicts and pandemics and other important factors discussed in the "Risk Factors" section of the Company's most recent Annual Report on Form 10-K and subsequently filed Quarterly Reports on Form 10-Q, and in other filings that the Company makes with the Securities and Exchange Commission. In addition, any forward-looking statements included in this presentation represent the Company's views only as of the date of its publication and should not be relied upon as representing its views as of any subsequent date. The Company specifically disclaims any intention to update any forward-looking statements included in this presentation, except as required by law.

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) with ***deep and durable responses*** observed in randomized, double-blind, placebo-controlled Phase 2b trial 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

- Plan to initiate Phase 3 study in 1H 2025
- Additional Phase 2b MG data expected by end of 2024
- IND filing for Phase 2 pediatric basket trial expected by end of 2024

DESCARTES-15

- Next-generation mRNA CAR-T candidate
- Dosing underway in first-in-human Phase 1 dose escalation trial

PRO FORMA CASH RESOURCES

- ***Strong balance sheet with approximately $220.9 million****
- Expected to support planned operations, including completion of planned Phase 3 trial of Descartes-08 for MG, into mid-2027

* As of September 30, 2024.

GMP, Good manufacturing practices

CAR, Chimeric antigen receptor

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

No Lymphodepletion

No associated cytopenia, secondary malignancies, or other chemotherapy toxicities

Administered Outpatient

Convenient dosing schedule

Delivered at Therapeutic Levels

Administered at therapeutic doses without uncontrollable proliferation

Transient Cell Modification

Does not carry risk of genomic integration

Cartesian therapeutics

Wholly-owned pipeline targets autoimmune disease

Asset	Indications	Discovery/Preclinical	Phase 1	Phase 2	Pivotal
Descartes-08 **Autologous mRNA CAR-T**	**Myasthenia Gravis (MG)**				
	Systemic Lupus Erythematosus (SLE)				
	Pediatric Autoimmune Diseases*				
Descartes-15 **Autologous mRNA CAR-T**	**Autoimmune Diseases****				

* IND for pediatric basket trial expected by year-end 2024, includes juvenile SLE, juvenile MG and other conditions.
** Dosing in Phase 1 dose escalation trial in myeloma underway.

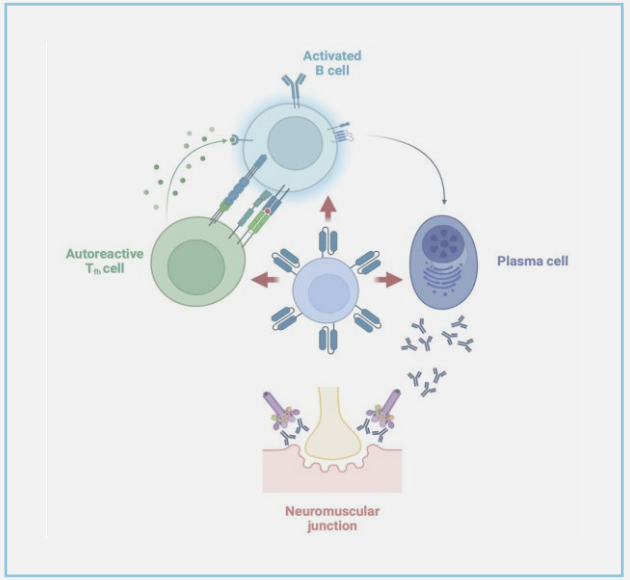
Descartes-08 is believed to be the first mRNA CAR-T in clinical development for autoimmune disease

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

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

Granted **U.S. FDA orphan and RMAT designations** for generalized myasthenia gravis, and **RPDD** for juvenile dermatomyositis

RMAT, Regenerative Medicine Advanced Therapy
RPDD, Rare Pediatric Disease Designation



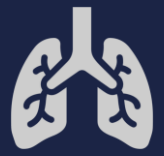
Myasthenia gravis is a rare, progressive autoimmune disease with significant unmet need

>120,000

Patients in the U.S. and EU

Characterized by debilitating fatigue and muscle weakness

Limbs



Respiratory

Ocular

Facial

Significant unmet need remains

Current treatments require chronic or frequent administration and have limited durability

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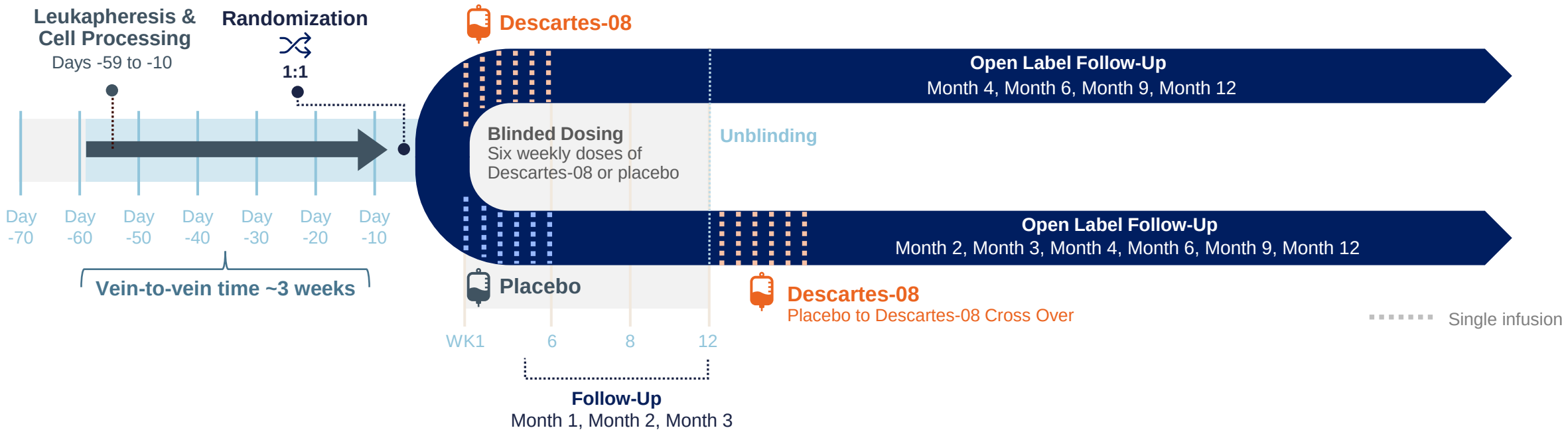
Phase 2b trial: double-blind, placebo-controlled clinical trial of Descartes-08 in patients with myasthenia gravis



INCLUSION CRITERIA

- Non-MuSK-MG
- MGFA Class II-IV
- MG-ADL ≥6
- Severe disease despite stable doses of immunosuppressants

PRIMARY ENDPOINT

- Proportion of patients with MG Composite improvement of ≥5-points at Month 3, relative to placebo
- Predefined primary efficacy dataset

SECONDARY OBJECTIVES

- Safety and tolerability from predefined safety dataset
- Quantify clinical effect of Descartes-08 over 1 year
- QMG, MG QoL 15R, MG-ADL (change from baseline to Month 3)
- Compare effect of Descartes-08 versus placebo on MG scales (change from baseline to Month 3) in patients who cross over from placebo to Descartes-08

MGFA, Myasthenia Gravis Foundation of America
MG-ADL, Myasthenia Gravis Activities of Daily Living scale

MG QMG, Quantitative MG Scores
MG QoL 15R, MG Quality of Life 15-revised

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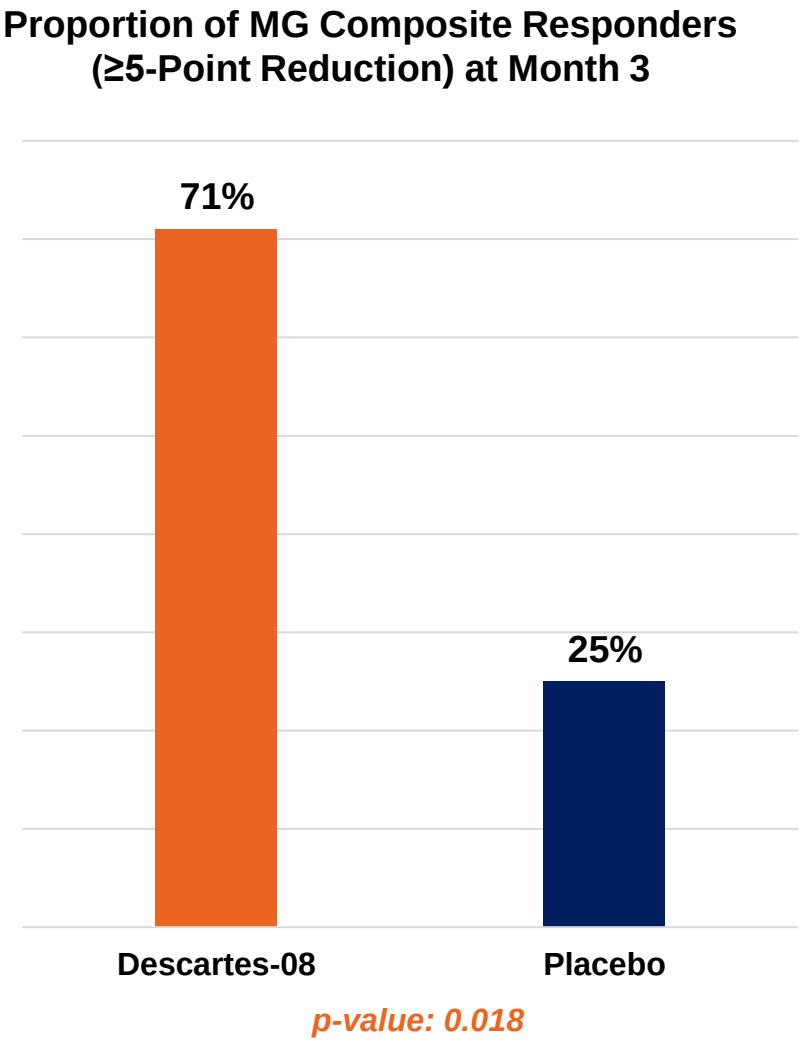
Descartes-08 in MG
Phase 2b Topline Results

- **Met primary endpoint**
- **Responders observed to have ~3x greater improvements than clinically meaningful***
- **Deep, durable responses observed in patients treated with Descartes-08**
- **Safety profile continues to support outpatient administration**
- **Data support advancement to Phase 3**



*Clinically meaningful response: three-point reduction in MG Composite score from baseline.

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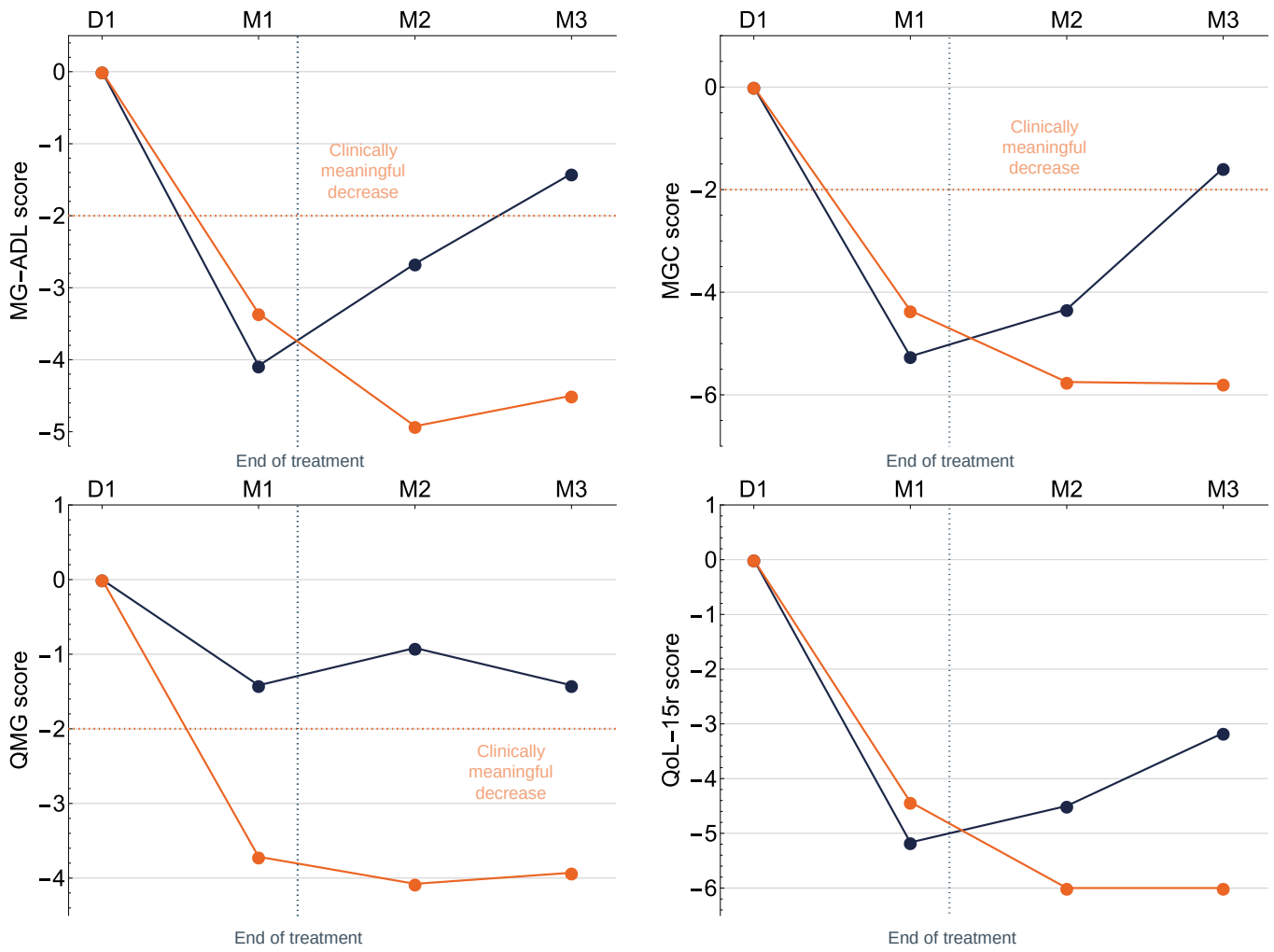
Statistically significant improvements observed in Descartes-08 patients at Month 3 assessment



- **Non-responders (n=4)**
  - 1 LRP4+ MG non-responder at Month 3 onward
  - 1 additional non-responder at Month 3 onward
  - 1 responded during open label follow-up
  - 1 has not reached 1st open label follow-up
- **Placebo response generally in line with expectations**

Mean decrease from Baseline in the prespecified primary efficacy population (n=26).
$p<0.05$ by Mann-Whitney U test at Month 3 in MGC and MG-ADL | LRP4+, low-density lipoprotein receptor-related protein 4

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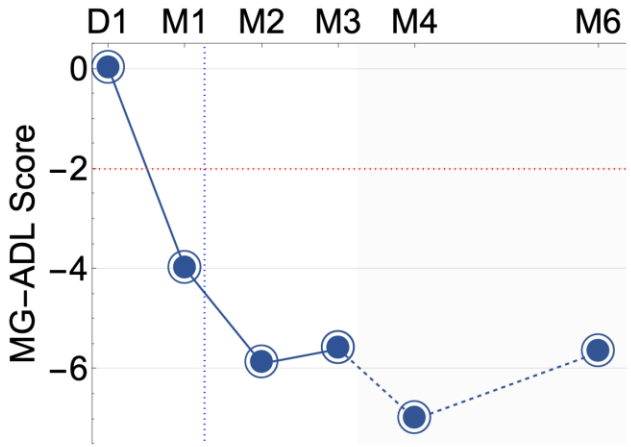
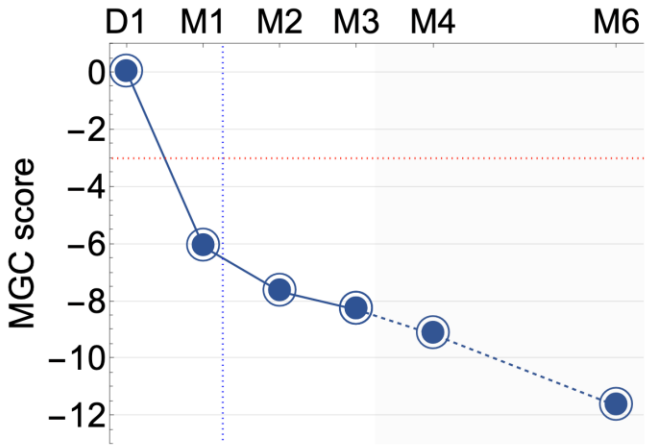
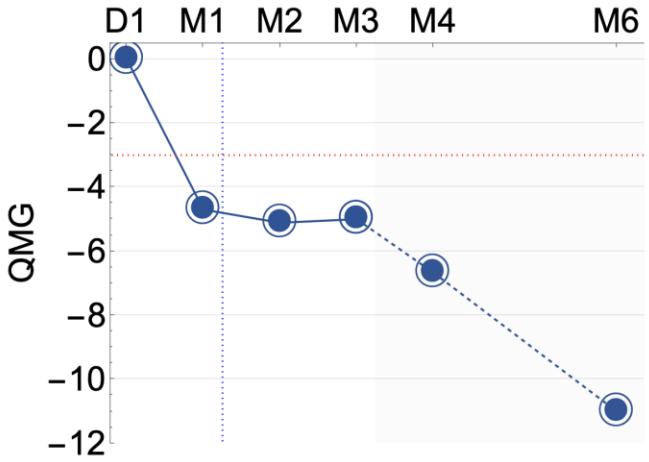
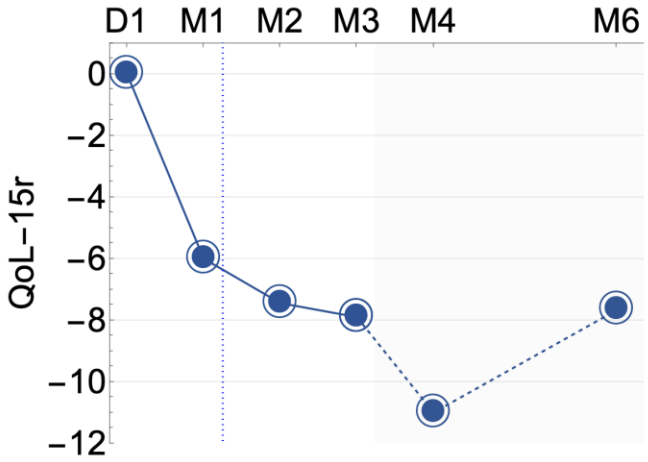
Deep and durable responses observed in Descartes-08 responders through Month 6









- **Results consistent with Phase 2a open-label trial findings**
- **Additional durability data expected by end of 2024**

Mean decrease from Baseline in MGC Responders (participants who achieved a ≥5-point reduction in MGC at Month 3, n=10.
Month 4 n=5, Month 6 n=3.

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Observed safety results support outpatient administration and in line with Phase 2a observations

	Descartes-08 (n=19)			Placebo (n=17)		
	Grade 1	Grade 2	Grade 3	Grade 1	Grade 2	Grade 3
Headache	6 (32%)	4 (21%)		2 (12%)	3 (18%)	
Chills	7 (37%)	4 (21%)		1 (6%)		
Nausea	2 (11%)	5 (26%)		2 (12%)	2 (12%)	
Fever	6 (32%)	3 (17%)	1 (6%)			
Fatigue	5 (26%)	1 (5%)		1 (6%)		
Myalgia	3 (16%)	3 (16%)		1 (6%)		
Infusion related reaction	1 (5%)	2 (11%)	1 (6%)	1 (6%)		
Muscle weakness	1 (5%)	1 (5%)		1 (6%)		
Arthralgia		1 (5%)		1 (6%)	1 (6%)	
Tachycardia	3 (16%)					
Herpes simplex reactivation	2 (11%)		1 (6%)			
Dysgeusia	3 (16%)					
Diarrhea	1 (5%)				1 (6%)	
Sweating	1 (5%)			1 (6%)		
Limb edema	1 (5%)	1 (5%)				
Flushing	2 (11%)					
Dyspnea	1 (5%)	1 (5%)				
Insomnia	2 (11%)					
Vomiting	2 (11%)					
Tremor	2 (11%)					

- **No cytokine release syndrome**
- **No neurotoxicity or ICANS**
- **Most AEs were transient or mild**

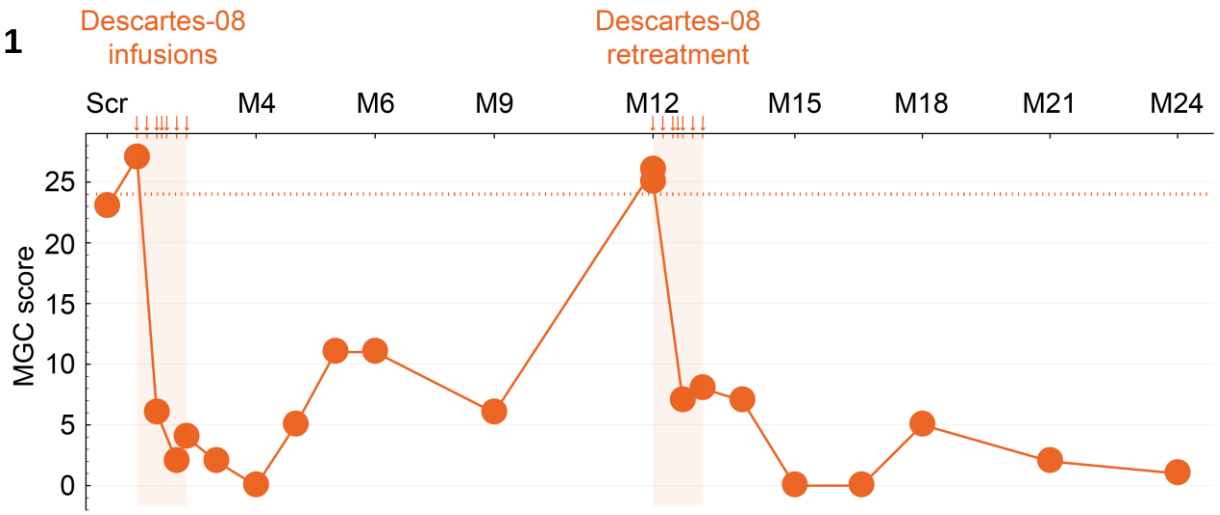
Safety dataset comprises all subjects who received at least one dose of Descartes-08 (n=19) or placebo (n=17).

All Grade 1–2 adverse events deemed possibly, probably or definitely related to the study drug with a cumulative incidence ≥10% and all Grade 3 adverse events deemed possibly, probably or definitely related to the study drug are reported. There were no Grade 4 adverse events.

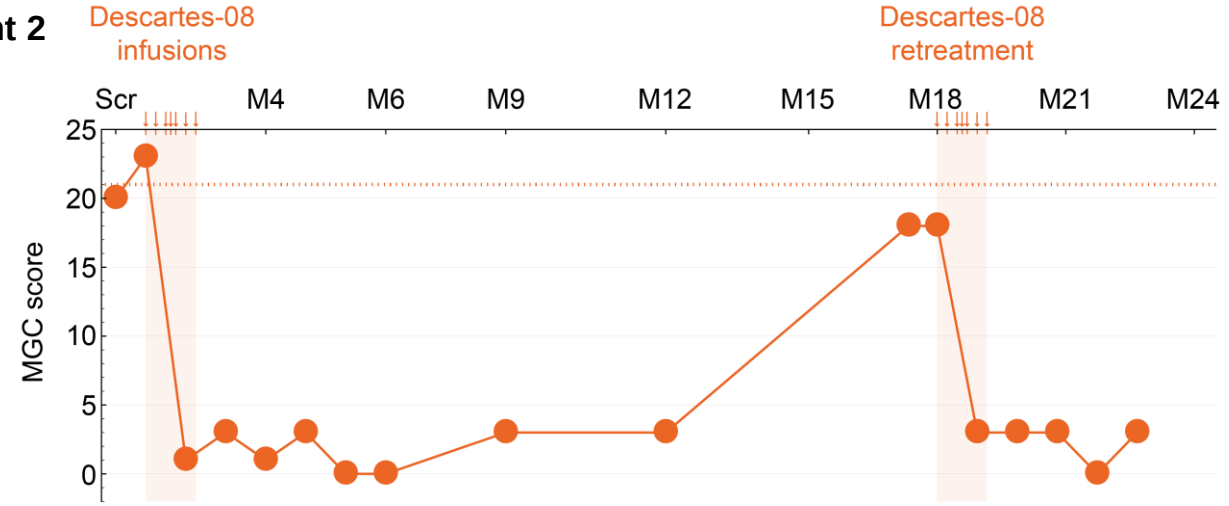
AE, Adverse event

Phase 2a update: Descartes-08 retreatment led to sustained clinically meaningful responses

Patient 1



Patient 2



- **Retreated patients experienced rapid improvement in clinical scores and maintained minimal symptom expression for up to one year after receiving second treatment cycle**

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

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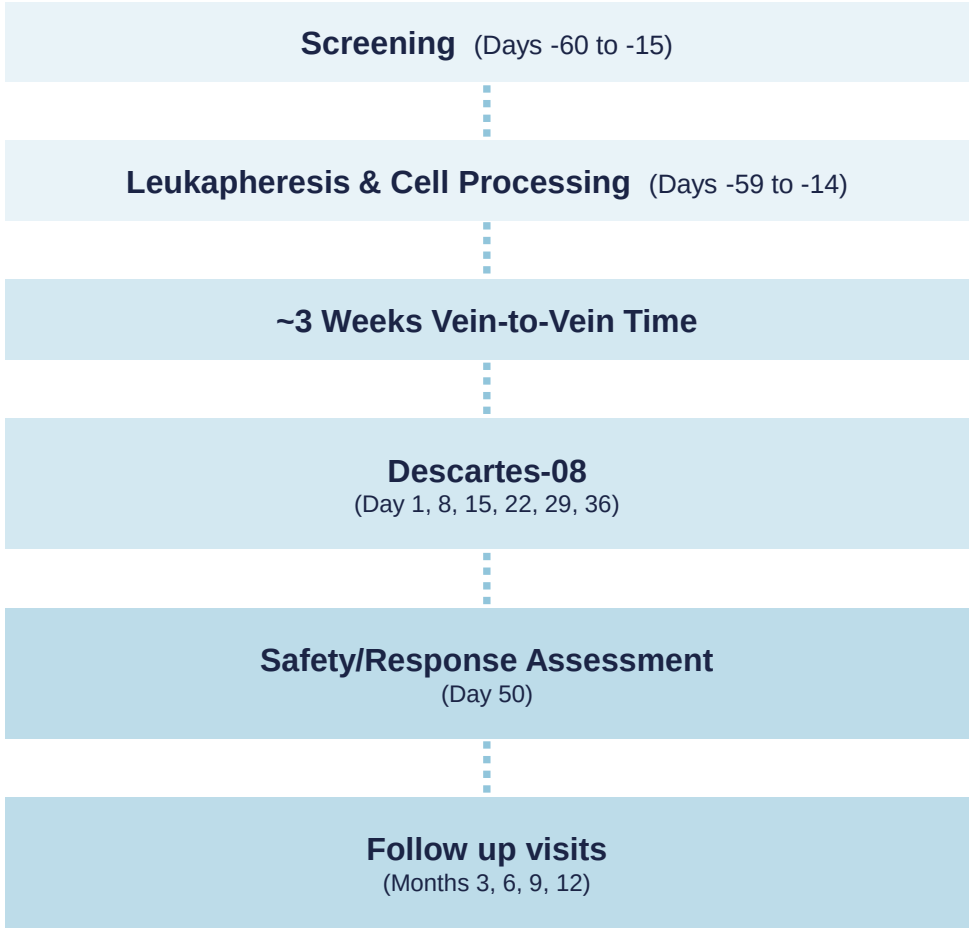
Exploring potential of Descartes-08 in Systemic Lupus Erythematosus (SLE)

IND CLEARED, FIRST PATIENT DOSED IN 1H 2024

PHASE 2 TRIAL ONGOING

- Open-label trial 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)



IND, Investigational New Drug Application

Intend to leverage the potential of Descartes-08 across multiple clinical programs

MG

- Plan to initiate Phase 3 clinical trial in 1H 2025
- RMAT designation to support efficient development plan in collaboration with FDA

SLE

- Open-label Phase 2 trial ongoing

Potential New Indications

- Plans to file IND application for pediatric basket trial in certain autoimmune diseases by year-end

Leveraging clinical proof-of-concept of Descartes-08 in MG to expand autoimmune pipeline

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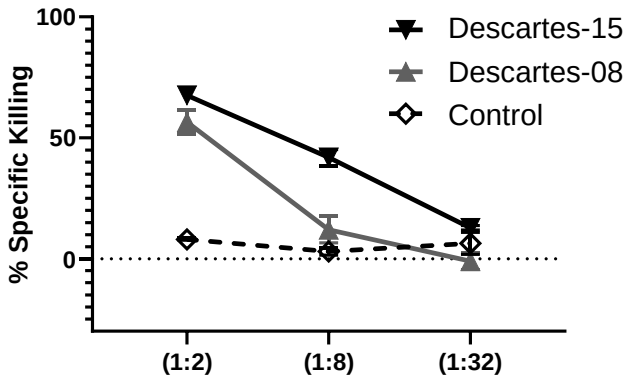
Descartes-15, a next generation anti-BCMA mRNA CAR-T with >10x potency observed in preclinical studies

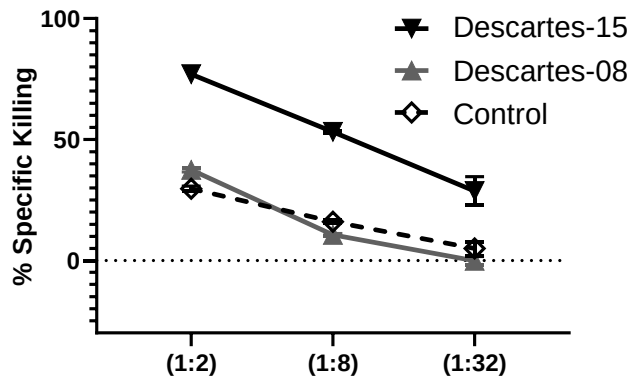
Descartes-15 is an anti-BCMA mRNA CAR-T with potential disruptive features:

- 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
- Phase 1 trial ongoing

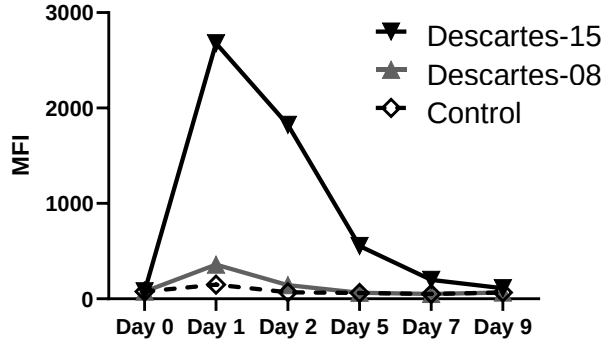
Potent killing (single target exposure)



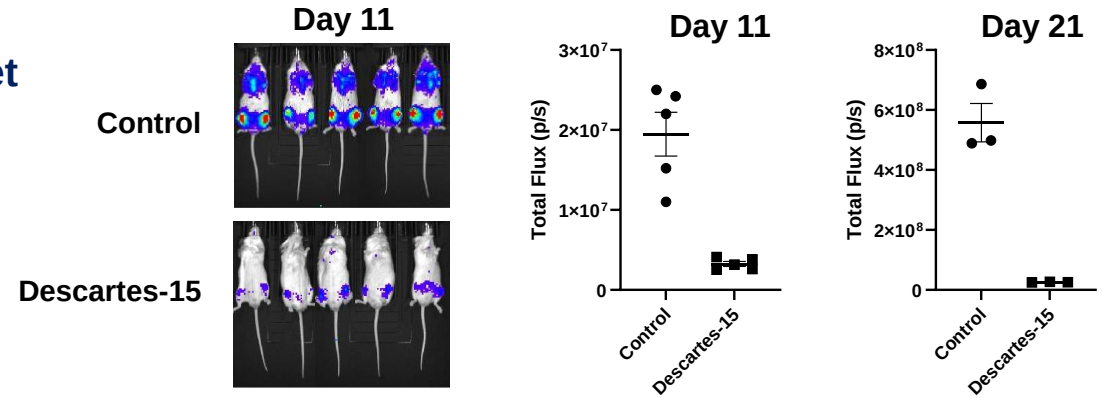
Persistent killing (multiple exposures)



Superior CAR expression



Efficient killing of BCMA+ target cells*



*MM1-S disseminated myeloma model in NSG mice infused with either control T-cells or Descartes-15.

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Wholly-owned, in-house manufacturing

~30,000 sq. ft. state-of-the-art cGMP facility

Facility located in Frederick, MD

FUTURE GROWTH

Clinical and commercial manufacturing scale capabilities support maturing pipeline and future growth

QUICK TO ADAPT

Flexibility to quickly adapt to changes in processes or needs

WHOLLY-OWNED

Ownership of quality control and production timelines

COST EFFICIENT

Potential cost efficiency

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Maturing pipeline offers potential for multiple catalysts

Descartes-08 in MG

Initiation of Phase 3 study expected in **1H 2025**; Updated efficacy and safety data from Phase 2b trial and Phase 3 trial design expected by **YE 2024**

Descartes-08 in SLE

Enrollment in Phase 2 open-label trial ongoing

Descartes-08 Pediatric Basket Trial

Plan to file IND for Phase 2 pediatric basket trial in certain autoimmune diseases in **2H 2024**

Descartes-15

Phase 1 first-in-human trial ongoing, with first patient dosed in **2H 2024**

STRONG FINANCIAL POSITION:

Expected to Support Pipeline Through Key Milestones

$220.9M

In cash, cash equivalents and restricted cash as of 9/30/24

<60 FULL TIME EMPLOYEES

Based in Gaithersburg, MD and Frederick, MD

25.4M

Basic shares outstanding as of 11/1/24

33.3M

Fully diluted shares outstanding*

* Further includes Series A Non-Voting Convertible Preferred Stock and Series B Non-Voting Convertible Preferred Stock that remain subject to beneficial ownership limitations that are convertible into shares of common stock and includes outstanding options, RSUs and warrants.

PIPE, Private investment in public equity

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Our team | Management

Carsten Brunn, PhD
PRESIDENT AND CEO

Blaine Davis, PhD
CHIEF FINANCIAL OFFICER

Metin Kurtoğlu, MD, PhD
CHIEF TECHNOLOGY OFFICER

Miloš Miljković, MD
CHIEF MEDICAL OFFICER

Chris Jewell, PhD
CHIEF SCIENTIFIC OFFICER

Jessica Keliher
CHIEF PEOPLE OFFICER

Emily English, PhD
SENIOR VICE PRESIDENT,
HEAD OF MANUFACTURING OPERATIONS

Matthew Bartholomae
GENERAL COUNSEL, SECRETARY

Key Takeaways

Pioneering mRNA Cell Therapies

Pipeline designed to expand the reach of cell therapy to autoimmunity

Maturing Pipeline with Expected Near-term Catalysts

Clinically differentiated platform with Phase 3 trial initiation planned for the 1H 2025

Experienced Leadership Team

Focused on disciplined investment and creating value for stockholders and patients

Strong Balance Sheet to Support Maturing Pipeline

Current pro forma cash expected to support Descartes-08 through the completion of Phase 3

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therapeutics

Appendix

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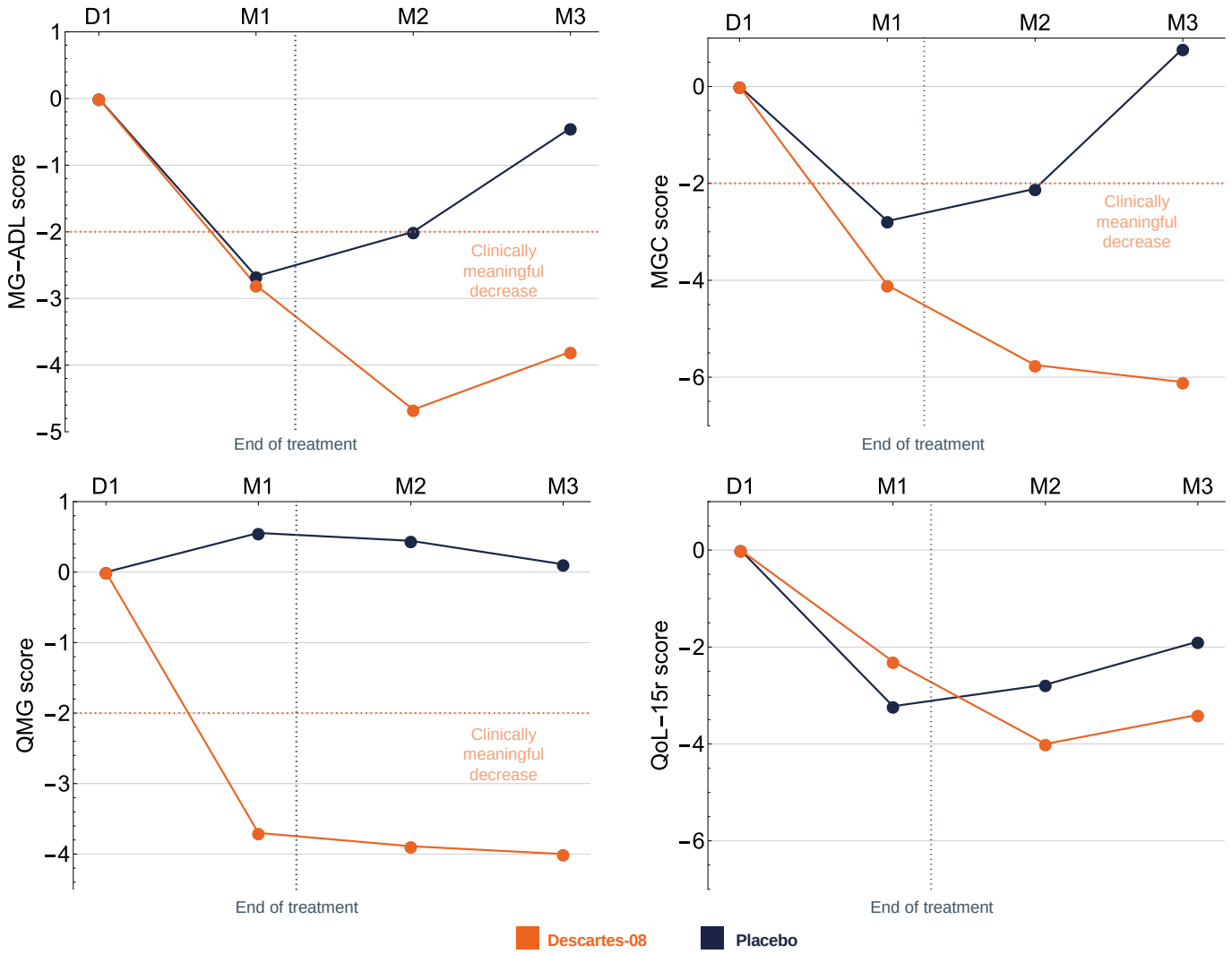
Descartes-08 demonstrated improvement across important measures of disease activity in AChR Ab+ MG subjects



- Statistically significant improvement in Descartes-08 compared to placebo at Month 3 seen across MGC (p=0.002), MG-ADL (p=0.012) and QMG (p=0.029)
- Placebo responses in AChR Ab+ subjects were consistent with Phase 2/3 published literature

Improvements from baseline in participants with AChR Ab+ MG receiving Descartes-08 (n=10) versus placebo (n=9).
* p<0.05, ** p<0.01 by Mann Whitney U test.

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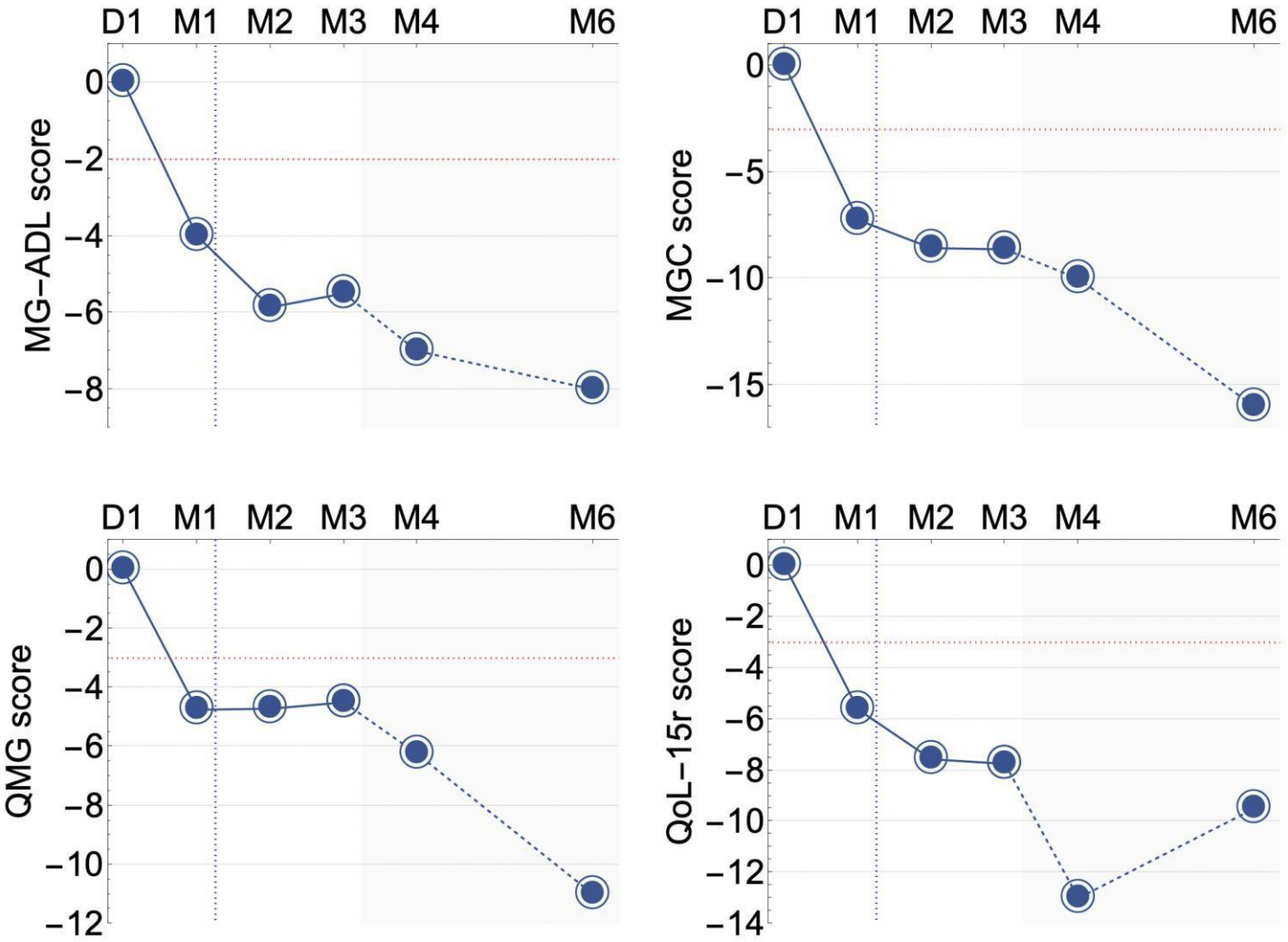
Deepest responses seen in participants with no prior exposure to complement or FcRn inhibitors



- Deepest responses seen in participants with no prior exposure to complement or FcRn inhibitors

Mean change from baseline in in patients with no prior biologics (Months 1–3 n=8, Month 4 n=4, Month 6 n=2).

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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

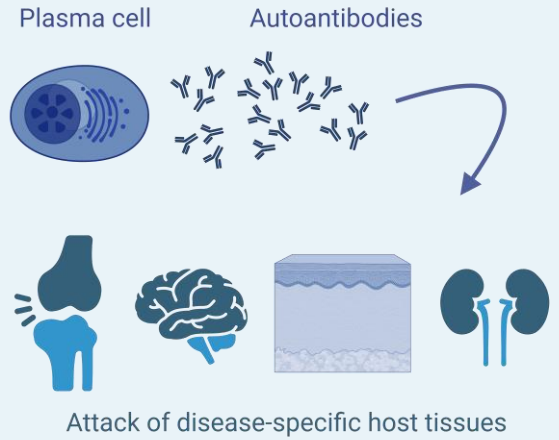
- PCs, plasmablasts and proliferating B cells targeted by Descartes-08 represent a tiny fraction of B cells
- These cells are entirely responsible for secreting pathogenic autoantibodies
- During autoimmunity, autoantibodies attack host tissue and drive inflammation

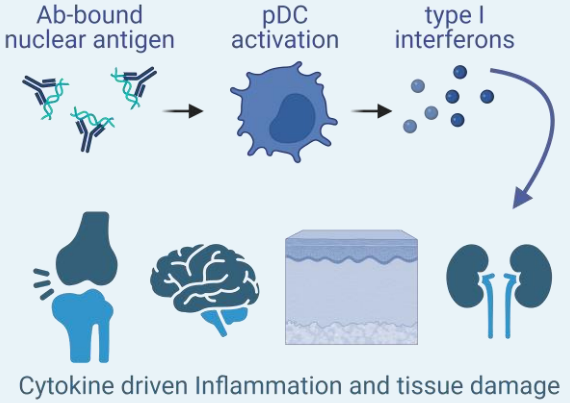
PLASMACYTOID DENDRITIC CELLS (pDCs)

- 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

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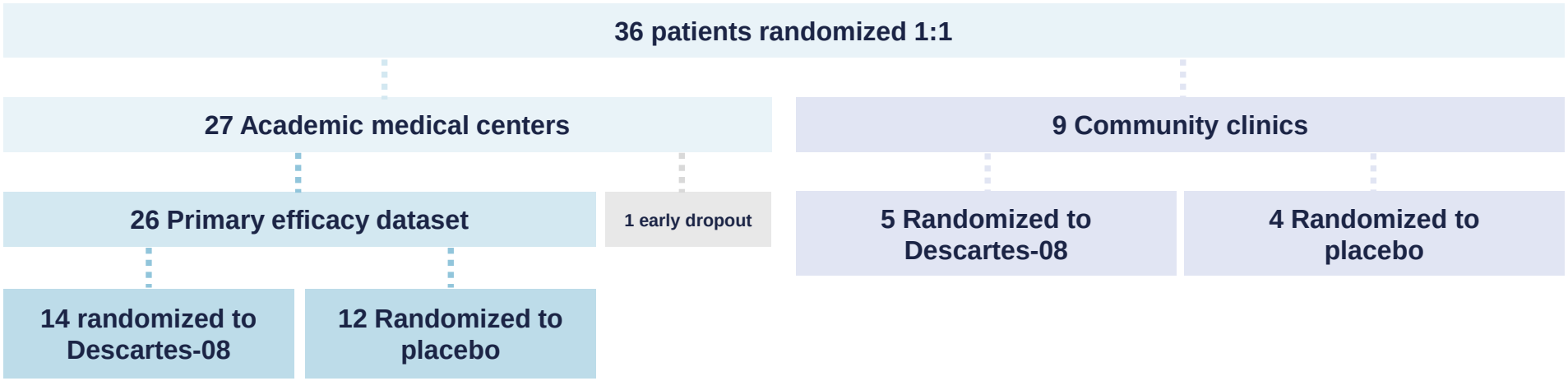
Phase 2b: 14 patients received Descartes-08 and 12 patients received placebo in the pre-specified primary efficacy dataset

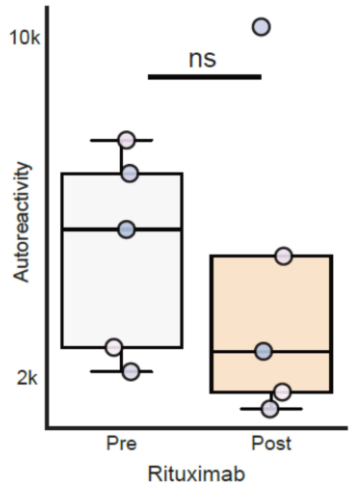


- Consistent with current IND, primary efficacy dataset includes modified ITT population enrolled at academic medical centers qualified for MG Composite assessment with at least one post-baseline follow-up
- Safety dataset includes all participants at academic medical centers and community clinics who received at least one dose of Descartes-08 or placebo

ITT, Intention to Treat

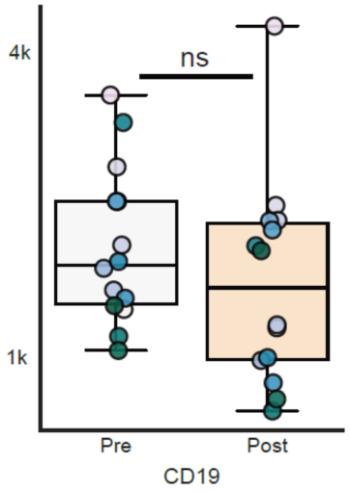
Clinical analyses of antigen-depletion therapies show BCMA-targeting with CAR-T may enable precision reset of autoantibody-producing PCs

Rituximab
(CD20+ cell depletion)



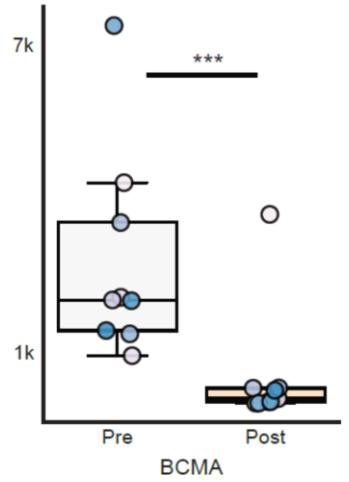
Minimal change in autoreactivity

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



Minimal change in autoreactivity

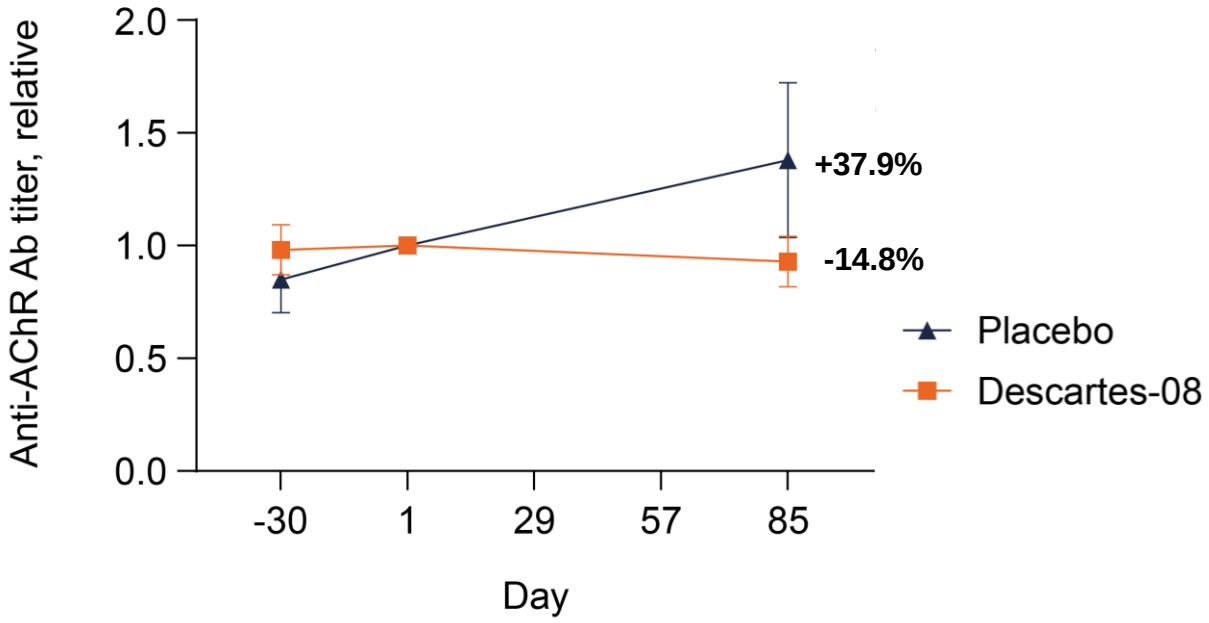
Anti-BCMA CAR-T
(BCMA+ cell depletion)



Nearly full reset of autoreactivity

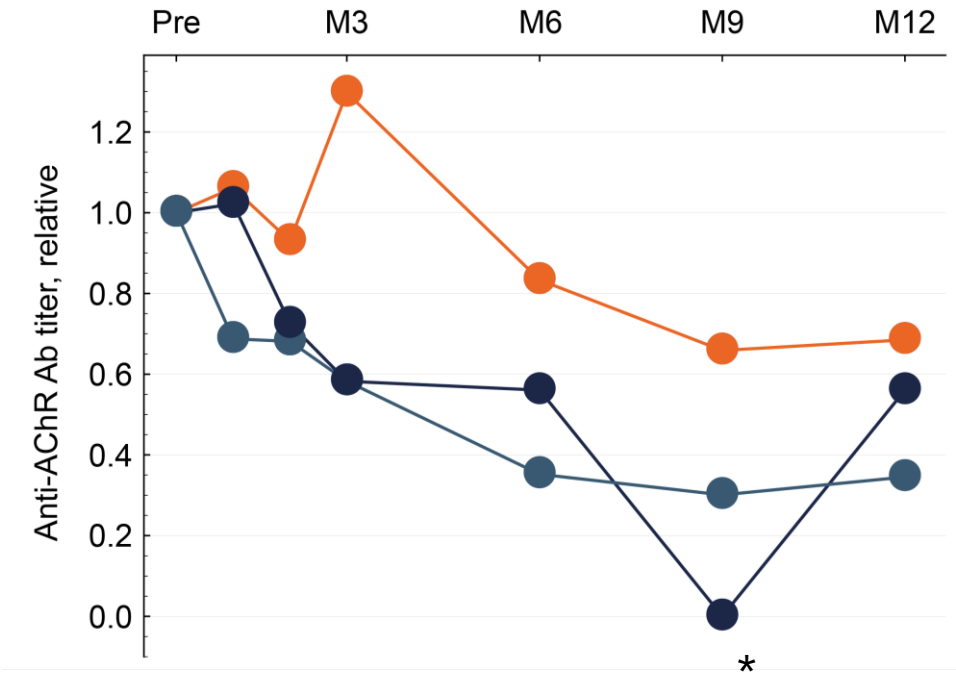
Bodansky et al., doi: 10.1101/2023.12.19.23300188.

Approximately 15% reduction in AChR antibody titer at Month 3 is in-line with Phase 2a data



Average reduction (±SEM) in AChR antibody in participants with baseline levels above LLOQ randomized to Descartes-08 (n=12) vs. Placebo (n=9).

Phase 2a data

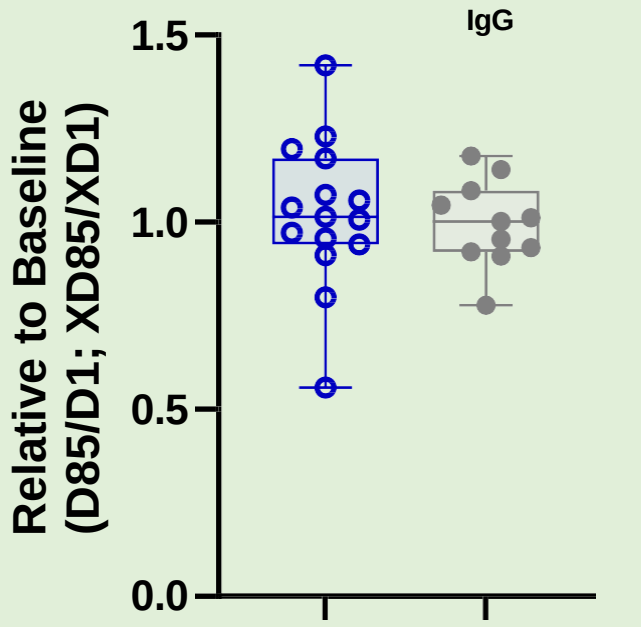


Individual Anti-AChR antibody titers in all participants receiving six once-weekly infusions in the Phase 2a trial with detectable baseline levels (n=3).

Cartesian therapeutics

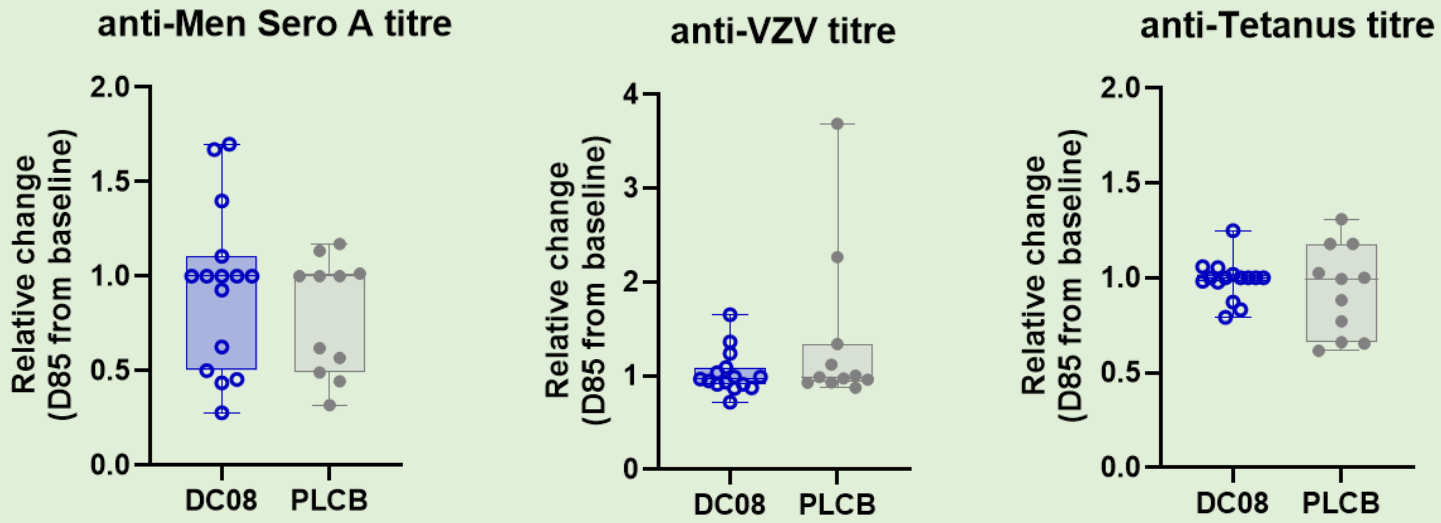
Descartes-08 does not deplete broader antibody repertoire or decrease vaccine titers for common viruses

No significance change in Ig at primary end point (D85) vs. Day 1[1]



Descartes-08 (DC08) Placebo (PLCB)

No significant change in common vaccine titers at primary end point (Day 85) relative to Day 1[2]



Not shown: anti-Men Sero C, anti-Men Sero W135, anti-Men Sero Y, anti-Diphtheria, anti-Measels, anti-Mumps and anti-Rubella titers

Descartes-08 (DC08) Placebo (PLCB)

Data indicate change in Ig levels for each patient in the miTT group (n = 26) at Day 85 relative to Day 1. Data are individual values, median, range and IQR.
Data indicate change in vaccines titers for each patient in the mITT group (n=26) at Day 85 relative to Day 1. Data are individual values, median, range and IQR.

Cartesian therapeutics