# Cartesian Therapeutics Initiates Clinical Trial of First RNA-Engineered Cell Therapy for Acute Respiratory Distress Syndrome and COVID-19

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*Descartes-30 engineered to express a unique combination of DNases to eliminate neutrophil extracellular traps (NETs), a key driver of inflammation and clotting in ARDS.*

**Gaithersburg, MD, September 1, 2020** – Cartesian Therapeutics, a fully integrated, clinical-stage biopharmaceutical company developing cell and gene therapies for cancer, autoimmune diseases and respiratory diseases, today announced that it has initiated a Phase 1/2 clinical trial of its lead RNA-engineered mesenchymal stem cell (MSC) therapy, Descartes-30, in patients with moderate-to-severe ARDS, including that caused by COVID-19. Based upon the company's research and analysis, this program is understood to be the first RNA-engineered cell therapy to enter clinical development for ARDS and COVID-19. It is also the first cell therapy to specifically degrade NETs, webs of extracellular DNA and histones that entrap inflammatory cells, block alveoli and vessels, and drive the pathogenesis of ARDS and COVID-19.

"Patients with ARDS, especially those with COVID-19 ARDS, generate copious amounts of NETs that physically obstruct alveoli and vessels, which leads to respiratory distress, immune-mediated thrombosis and a vicious cycle of inflammation," said Bruce Levy, MD, Chief of Pulmonary and Critical Care Medicine at Brigham and Women's Hospital and Parker B. Francis Professor at Harvard Medical School, and a clinical investigator in the Descartes-30 trial. "We would therefore expect that degrading NETs would improve oxygenation as well as resolve thrombi and quell inflammation in these patients. If successful, Descartes-30 would be a highly differentiated game-changer within our limited toolkit in managing this exceedingly difficult condition."

Descartes-30 is an off-the-shelf (allogeneic) MSC product engineered with Cartesian's RNA Armory $^{SM}$ cell therapy platform. By expressing a unique combination of DNases that work synergistically, Descartes-30 can eliminate large, macroscopic amounts of NETs within minutes. MSCs are inherently immunomodulatory and naturally travel to the lungs, where they are expected to provide continuous, local delivery of DNases to NET-laden lung tissue.

"We engineered Descartes-30 without genomic modification, and therefore the production of DNases is expected to be time-limited to match the acute nature of ARDS," said Metin Kurtoglu, MD, PhD, Chief Medical Officer at Cartesian. "Given that Descartes-30 will produce DNases locally and transiently, we anticipate that it will have a favorable benefit-to-risk profile. We also anticipate that these properties will enable Descartes-30 to treat a wide array of NET-related autoimmune and cardiovascular diseases."

About the Phase 1/2a Clinical Trial

The "Phase 1/2a Study of Descartes-30 in Acute Respiratory Distress Syndrome" ( NCT04524962) is enrolling patients with ARDS at multiple critical care units in the United States. Patients with ARDS due to COVID-19 are given enrollment priority. This first-in-human study aims to determine the safety and preliminary efficacy of Descartes-30 in patients with moderate to severe ARDS. The study, which is estimated to begin treatment in September, aims to enroll approximately 20 patients prior to initiation of a larger study. For more information visit cartesiantherapeutics.com/Descartes-30-ARDS.

About ARDS and NETs

ARDS is a severe inflammatory lung disease with a mortality of over 40%. Inflammation leads to injury of lung tissue and leakage of blood and plasma into air spaces, resulting in low oxygen levels and often requiring mechanical ventilation. Inflammation in the lung may lead to inflammation elsewhere, causing shock and injury or dysfunction in the kidneys, heart, and muscles. Some causes of ARDS include COVID-19, severe pneumonia (including influenza), sepsis, trauma, and smoke inhalation.

NETs are inflammatory webs of DNA and proteins produced by neutrophils. NETs are commonly found in ARDS and are thought to exacerbate the disease by physically occluding air spaces and vessels, leading to reduced oxygenation and increased risk of immune thrombi. NETs are implicated in a variety of conditions beyond ARDS, including autoimmune and cardiovascular diseases.

About the RNA Armory$^{SM}$

The RNA Armory$^{SM}$ is Cartesian's proprietary RNA-based cell engineering platform that activates and arms cells with carefully selected, mRNA-based therapeutics. Unmodified donor cells enter the RNA Armory$^{SM}$ in the millions; a battle-ready cell army leaves the RNA Armory$^{SM}$ in the tens of billions. Each cell is equipped with a combination of therapeutics rationally chosen to have a synergistic effect on the disease. In the body, the cells deliver a precision-targeted treatment regimen directly to the site of disease. The cells express therapeutics with a defined half-life, enhancing their safety profile and making repeat dosing and outpatient administration possible. The platform is agnostic to cell type: we choose the best cell for the job, whether autologous or off-the shelf. For more information visit cartesiantherapeutics.com/rna-armory.

About Cartesian Therapeutics

Founded in 2016, Cartesian is a fully integrated, clinical-stage biopharmaceutical company developing potent yet safer cell and gene therapies designed to benefit the broadest range of patients with cancer, autoimmune and respiratory diseases. Cartesian has three products in clinical development under four open investigational new drug application (INDs) with the U.S. Food & Drug Administration (FDA). All investigational therapies are manufactured at Cartesian's wholly owned, state-of-the-art cGMP manufacturing facility in Gaithersburg, MD. Cartesian's commanding IP position benefits in part from a broad, exclusive patent license from the National Cancer Institute. For more information visit www.cartesiantherapeutics.com/trials.

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