



The Evolution of Regenerative Medicine in post-infarction myocardial fibrosis

$$2 + 2 = 5$$

Why?

Innovative Synergy for a
Supra-additive Effect!

Founded in 2015 in London (UK), Cell and Gene Therapy Ltd. has emerged as a leading biotech company and a principal member of an international group specializing in the development of gene therapy drugs. The core concept of the products lies in the masterful combination of traditional and innovative elements, creating a supra-additive effect and forging a unique solution. Within this concept, the following components are envisioned:

Unique DNA Vectors

Our DNA vectors, developed and patented as a platform solution, elegantly combine efficacy, safety, and flexibility by integrating universal or tissue-specific and inflammation-activated promoters with coding sequences of target genes.

Multiplicity of Targets

Therapeutic diversity is achieved through the use of a composition of next-generation DNA vectors containing genes, each of which is directed at corresponding target.

Advanced Delivery Systems

The use of modern delivery systems enables the attainment of therapeutically significant concentrations of target proteins, thereby maximizing the drug's therapeutic effect.

Technological Excellence

The use of proven technologies allows the drug to be manufactured at various standard biotechnological facilities, achieving both competitive pricing and high profitability.



Our development priorities focus on diseases that currently have no effective treatments available, such as **Alzheimer's disease, Parkinson's disease, multiple sclerosis, liver fibrosis, myocardial fibrosis** along with numerous other diseases. Furthermore, we are dedicated to addressing **type 2 diabetes mellitus and obesity**, as well as rare and orphan diseases.

Focus on Pathology

Priority is given to the careful selection of targets within pathological biological processes, focusing on underlying mechanisms rather than merely addressing disease symptoms, to achieve effective and sustainable therapeutic outcomes.

Use of Native Genes

The use of native genes ensures harmonious integration with natural biological processes, reducing the risk of adverse reactions and enhancing the drug's biocompatibility.

Precision Delivery

The use of optimal promoters ensures accurate and efficient delivery of DNA vectors to target cells, enhancing overall therapy efficacy and minimizing off-target effects.

Regulatory Compliance

The vectors' structural elements, developed as part of our platform solution, fully comply with FDA and EMA requirements, ensuring strict safety and efficacy standards.

Since 2015, an international team of scientists, spearheaded by our company, has dedicated extensive intellectual resources and cutting-edge research efforts to this project, ultimately leading to the development of a groundbreaking universal platform solution — non-viral DNA vectors series VTvaf17 and GDDT1.8NAS — for creating advanced genetic tools in the rapidly evolving fields of biomedical and genetic technologies. These DNA vectors incorporate the unique RNA-out regulatory element from the Tn10 transposon, thus enabling antibiotic-free positive selection, and offering the following key advantages:

Maximum Safety

The **absence of antibiotic resistance genes** and **viral genome sequences** in our DNA vectors, in accordance with EMA and FDA recommendations, ensures the highest safety. This distinct combination in a non-viral DNA vectors makes our solution **one-of-a-kind globally**.

Nature-like Mechanism

The use of **non-modified native genes** ensures seamless integration with natural biological processes, minimizing the risk of adverse reactions.

Precision Expression

By integrating **cell-specific and inflammation-activated promoters**, our drugs achieve precise and effective expression of genes in target cells while minimizing undesirable side effects.

Superior Performance

By incorporating **advanced delivery systems** into our drug, we achieve therapeutically significant concentrations of target proteins.

Multiply Therapeutic Targets

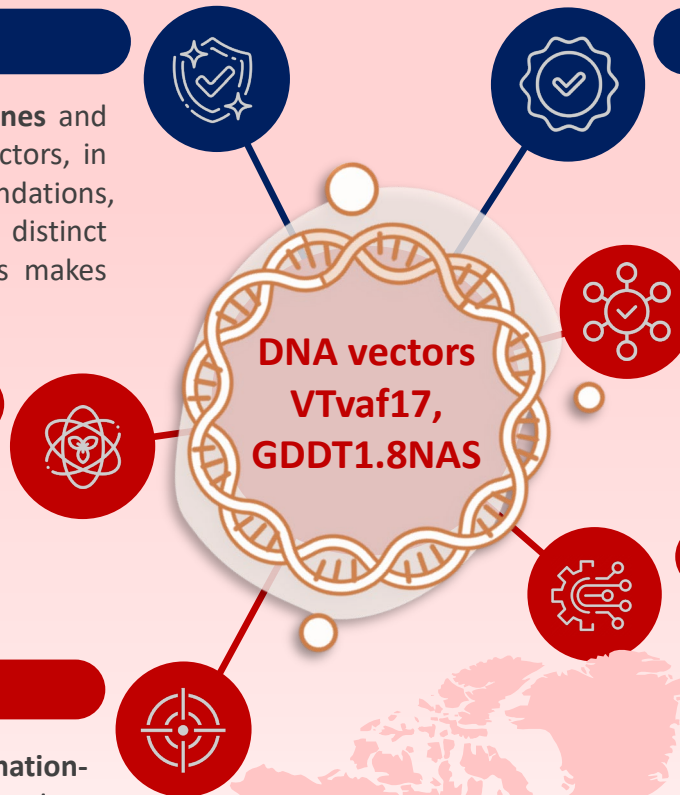
Creation of a **unique composition of genes** empowers our drugs to simultaneously target multiple therapeutic pathways, achieving a synergistic effect.

Technological Excellence

Implementation of high-tech manufacturing techniques optimizes production processes, achieving **exceptional efficiency** and **significant cost reductions**.



The intellectual property associated with this project is protected by **more than 30 patents** across various countries worldwide, highlighting the **unique** and **innovative** nature of the product.



We have developed the unique gene therapy candidate CG-FM544 for the treatment age-related myocardial degeneration. It is aimed at targeted fibrosis destruction and metabolic reanimation; regenerative renewal of the myocardium with restoration of functional architecture — processes that require coordinated gene activity but traditionally carry significant risks. In this concept, these challenges are addressed through the use of a composite promoter that is activated exclusively in target cells under inflammation or hypoxia, a multi-stage administration regimen, and a precisely selected gene set, ensuring that the therapeutic effect is delivered exactly where it is needed.

Focus on Pathology

Priority attention is given to the processes of targeted fibrosis destruction and metabolic reanimation; regenerative renewal of the myocardium with restoration of functional architecture

Multiplicity of Targets

Therapeutic versatility is achieved through the use of innovative DNA vectors containing a carefully designed and precisely optimized composition of genes responsible for a range of biological processes that are intricately associated with the disease.

Advanced Delivery Systems

A complex of cationic liposomes + PEG with *** functionalization's been selected as the delivery system, which ensures the achievement of therapeutically significant concentrations of target proteins, thereby maximizing the therapeutic effect.

Technological Excellence

The use of proven technologies allows the drug to be manufactured at various standard biotechnological facilities, achieving both competitive pricing and profitability.

Treatment Protocols

A two-stage administration protocol: the drug is delivered sequentially and systematically, with each of the two stages precisely targeting a specific therapeutic goal, thereby ensuring maximum efficacy while effectively minimizing the risk of adverse events.

Unique DNA Vectors

Our therapeutic DNA vectors of GDDT1.8NAS series developed and patented as a platform solution, elegantly combine efficiency, safety, and the flexibility to vary with universal and tissue-specific promoters and coding sequences of genes.

Use of Native Genes

The use of native genes I***, A***, S***, H***, C**, M***, B***, C***, T***, G***, M***, E*** ensures harmonious integration with natural biological processes, thereby reducing the risk of adverse reactions and enhancing the drug's biocompatibility.

Precision Delivery

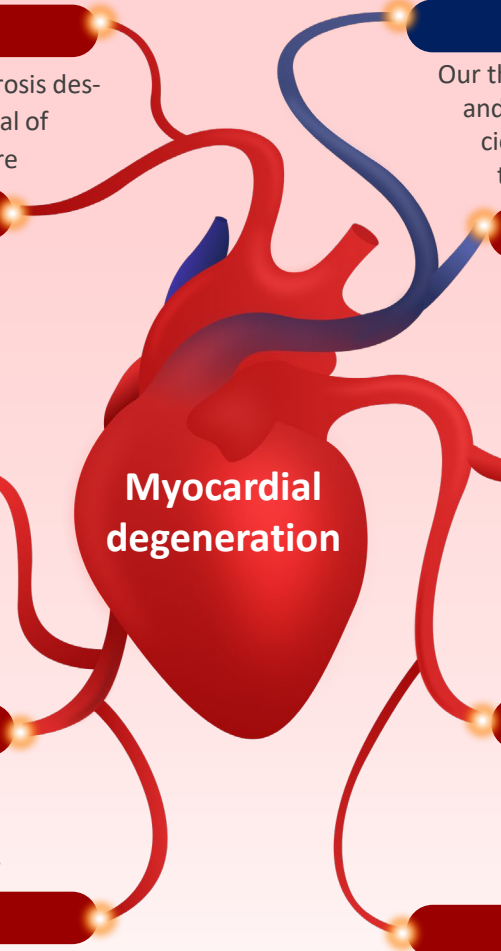
The use of combinations of tissue-specific and inflammation / hypoxia – activated promoters ensures precise delivery of DNA vectors into target cells, further enhancing overall therapeutic efficiency and consequently minimizing ectopic effects.

Regulatory Compliance

The composition of structural elements of the vectors, developed and patented as part of a platform solution, fully complies with FDA and EMA requirements, guaranteeing adherence to strict safety and efficacy standards.

Method of administration

Intra-arterial infusion with pre-hydration and subsequent ultrasound-assisted targeted delivery (UTMD) and FUS are designed and optimized to ensure maximum penetration and effective, uniform drug distribution into the target tissues of the patient's heart.



Myocardial degeneration

The project's strategy involves the creation of a pharmaceutical agent for the therapeutic implementation of the following biological processes directly related to the disease, for which there are currently no registered medications. A treatment regimen - two-stage pulse administration - was selected to maximize drug efficacy while minimizing uncontrolled therapeutic-gene interactions:

Therapeutic Stage 1

Targeted fibrosis destruction and metabolic reanimation

At this stage, the primary focus is on the controlled degradation of fibrotic tissue and the metabolic recovery of border-zone cardiomyocytes. The therapeutic approach aims to restore autophagy and proteostasis, and stimulate angiogenesis.

Task

Description

Gentle degradation of the fibrosis

Controlled degradation of scar matrix components to create a permissive environment for myocardial renewal

Cardiomyocyte protection

Prevents phagocytosis of damaged but still viable cardiomyocytes that have been erroneously opsonized

Restoration of proteostasis

Reactivates autophagy, mitophagy, and intracellular protein turnover to ensure full metabolic recovery and mitotic readiness of surviving cardiomyocytes

Revascularization

Induces angiogenesis to restore blood supply and metabolic support to regenerating myocardial tissue

Therapeutic Stage 2

Regenerative renewal of the myocardium with restoration of functional architecture

The main objective is to repopulate the damaged myocardial area with functional cardiomyocytes and restore contractile and conductive integrity of the tissue, that leads to the complete structural and functional recovery of the myocardium.

Task

Description

Cardiomyocyte proliferation

Stimulates division of existing cardiomyocytes to repopulate the damaged myocardial region

Electrical integration

Formation of functional gap junctions between cardiomyocytes to restore synchronized electrical conductivity

Mechanical integration

Facilitates the establishment of adhesive junctions ensuring mechanical stability and coordinated contraction

Extracellular Matrix Remodeling

Guides the restructuring of the ECM to achieve optimal elasticity and alignment within the regenerated zone

Exposure Period