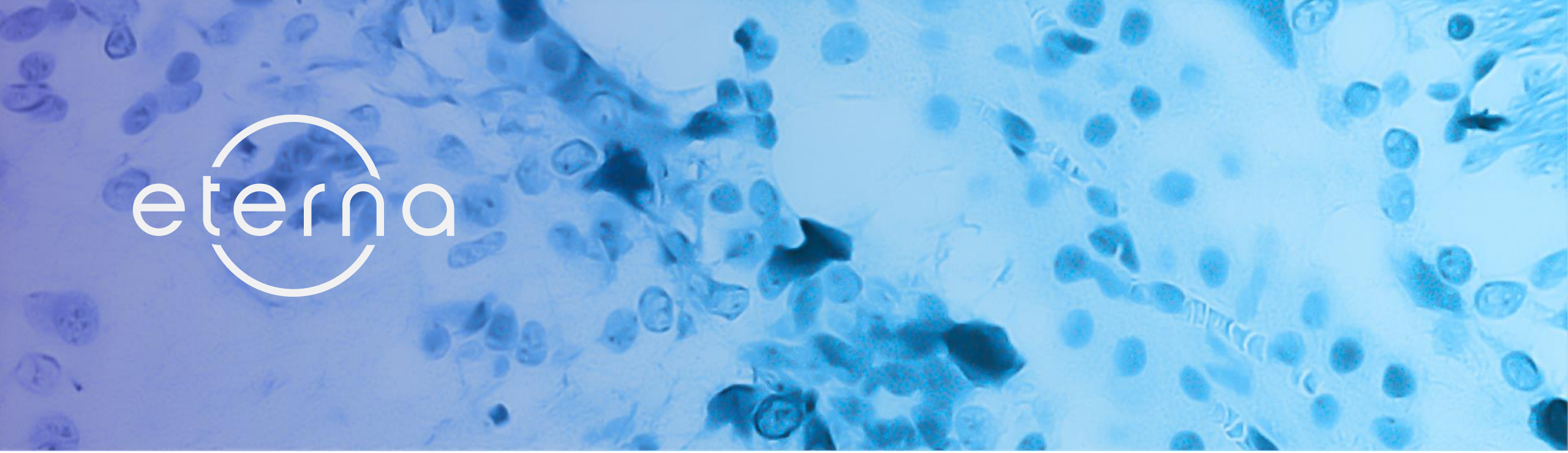

Eterna Therapeutics

Investor Presentation

August 2023

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Forward-Looking Statements

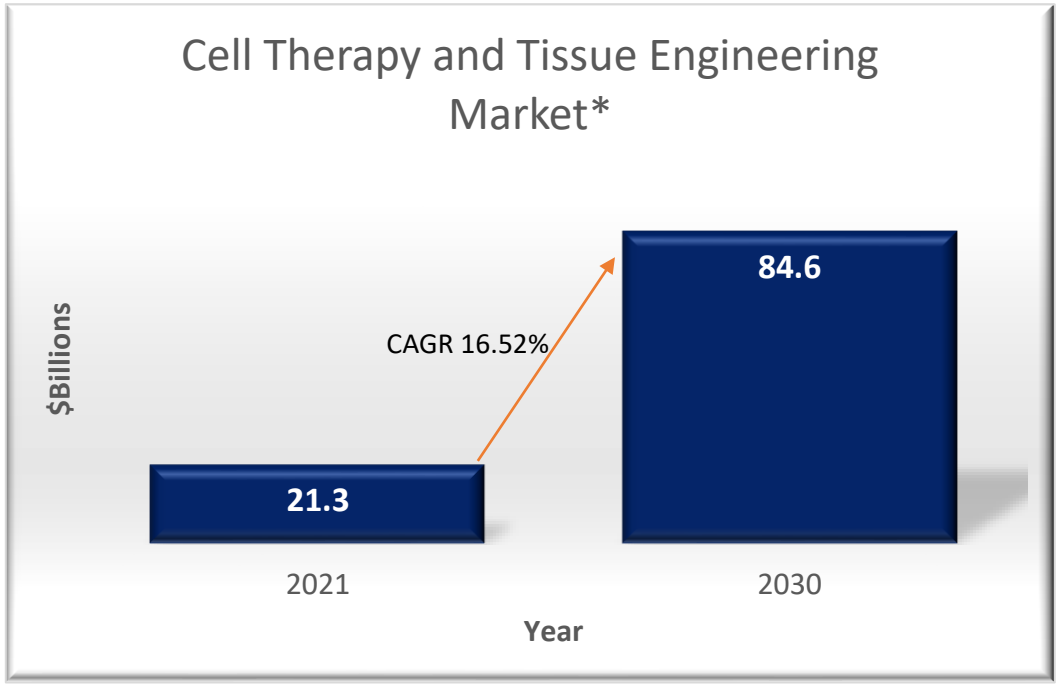
This Presentation includes certain "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements may address, among other things, the Company's expected plans and prospects, including without limitation, the Company's views with respect to the potential for mRNA Cell Engineering, its expectations with respect to timing of regulatory filings and the reporting of initial data from any clinical trial(s), the potential therapeutic opportunities for mRNA Cell Engineering, its expectations regarding its product strategies, and its plans regarding commercialization of mRNA Cell Engineering. These forward-looking statements are distinguished by use of words such as "anticipate," "aim," "believe," "continue," "can," "could," "designed to," "estimate," "expect," "intends," "may," "might," "plan," "possible," "potential," "predict," "project," "should," "will," "would" and the negative of these terms, and similar references to future periods. These statements are based on management's current expectations and are subject to uncertainty and changes in circumstances. Actual results may differ materially from these expectations due to, among other things, the Company's ability to discover and develop novel drug candidates and delivery approaches, the Company's ability to successfully demonstrate the efficacy and safety of its drug candidates, the pre-clinical and clinical results for its product candidates, which may not support further development of product candidates, the actions of regulatory agencies, which may affect the initiation, timing and progress of clinical trials, obtaining, maintaining and protecting intellectual property, the Company's ability to enforce its patents against infringers and defend its patent portfolio against challenges from third parties, obtaining regulatory approval for products, competition from others using technology similar to the Company's and others developing products for similar uses, the Company's ability to manage operating expenses, the Company's ability to obtain additional funding to support its business activities and establish and maintain strategic business alliances and new business initiatives, the Company's dependence on third parties for development, manufacture, marketing, sales and distribution of products, the outcome of litigation, and unexpected expenditures.

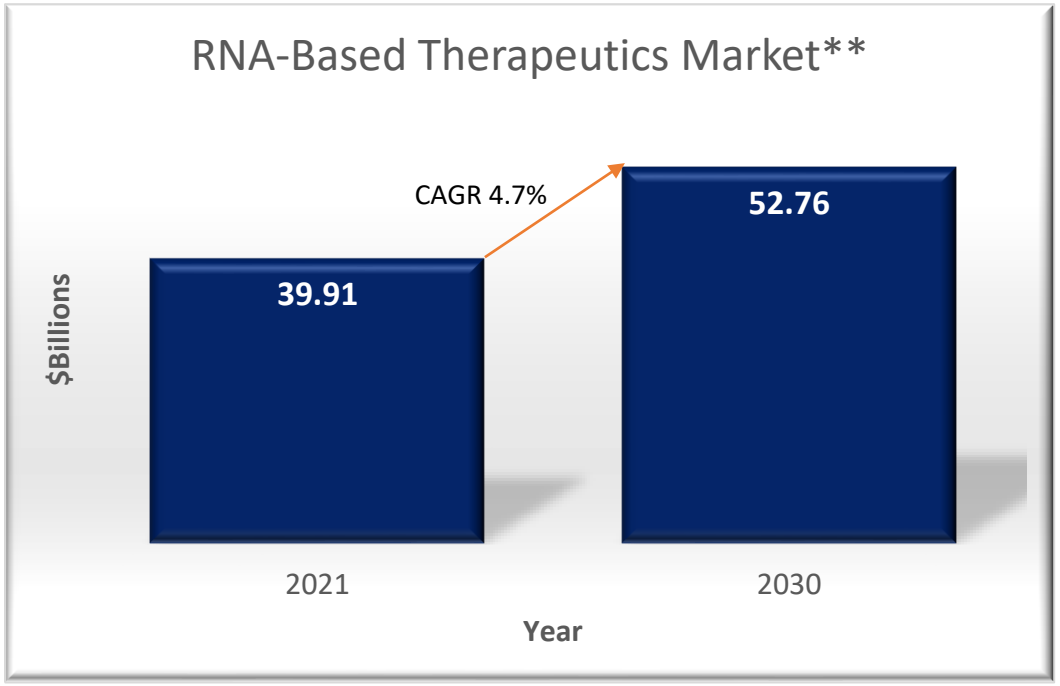
Detailed information about these factors and additional important factors can be found in the documents that the Company files with the Securities and Exchange Commission, such as Form 10-K, Form 10-Q and Form 8-K. Forward-looking statements speak only as of the date the statements were made. The Company does not undertake an obligation to update forward-looking information, except to the extent required by applicable law.

Investment Highlights

- ✓ **Novel technologies** primed to generate value through collaborations and partnerships, and compete in **growing, multi-billion dollar markets**
- ✓ **Gene editing and mRNA delivery** technology instrumental for R&D in cell engineering
- ✓ Technology is protected by a diligently prosecuted patent portfolio with over **130 granted patents**
- ✓ Corporate strategy designed to **maximize value of technologies and runway**, while ensuring continued progress for key activities

Primed to Compete in Growing, Multi-billion $ Markets





Eterna's technology is designed to potentially help solve a variety of industry problems, including efficient editing and delivery

*Verified Market Research;**Nova1Advisor

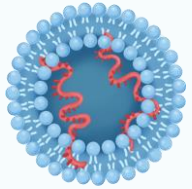
Eterna: An Innovative RNA Cell Engineering Company

The Eterna Platform

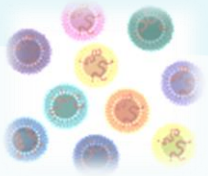
Technology

RNA

Gene Editing Platforms

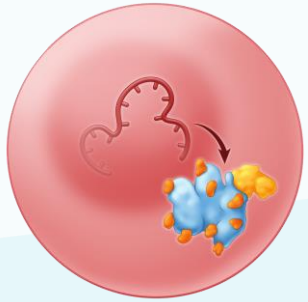


ToRNAdo™
RNA Delivery

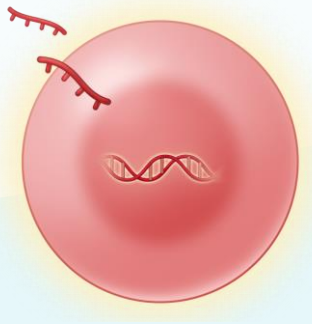


Library of Ionizable
Lipids

Applications



RNA
Gene Editing



RNA
Cell Reprogramming

Each platform is supported by a significant intellectual property estate with patents designed to both support and foster candidate development and trademarks designed to provide additional brand exclusivity and recognition

Substantial Shortcomings Remain with Industry Standard Gene Editing Technologies

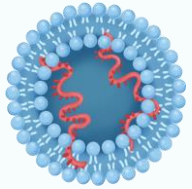
Other Technologies in Use	Key Shortcomings
TALENs	• **Can be complex or can require expensive customization** • **Immunogenic** • **Potential cause of autoimmune diseases** • **Potential for undesired mutations (“off-target effects”)** • **Potential for undesired genome disruption** • **Delivery challenges**
CRISPR	

Potential Advantages of Eterna's Novel RNA Technologies with Gene Editing and Cell Reprogramming Applications

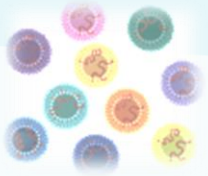
Technology

RNA

Gene Editing Platforms



ToRNAdo™
RNA Delivery



Library of Ionizable Lipids

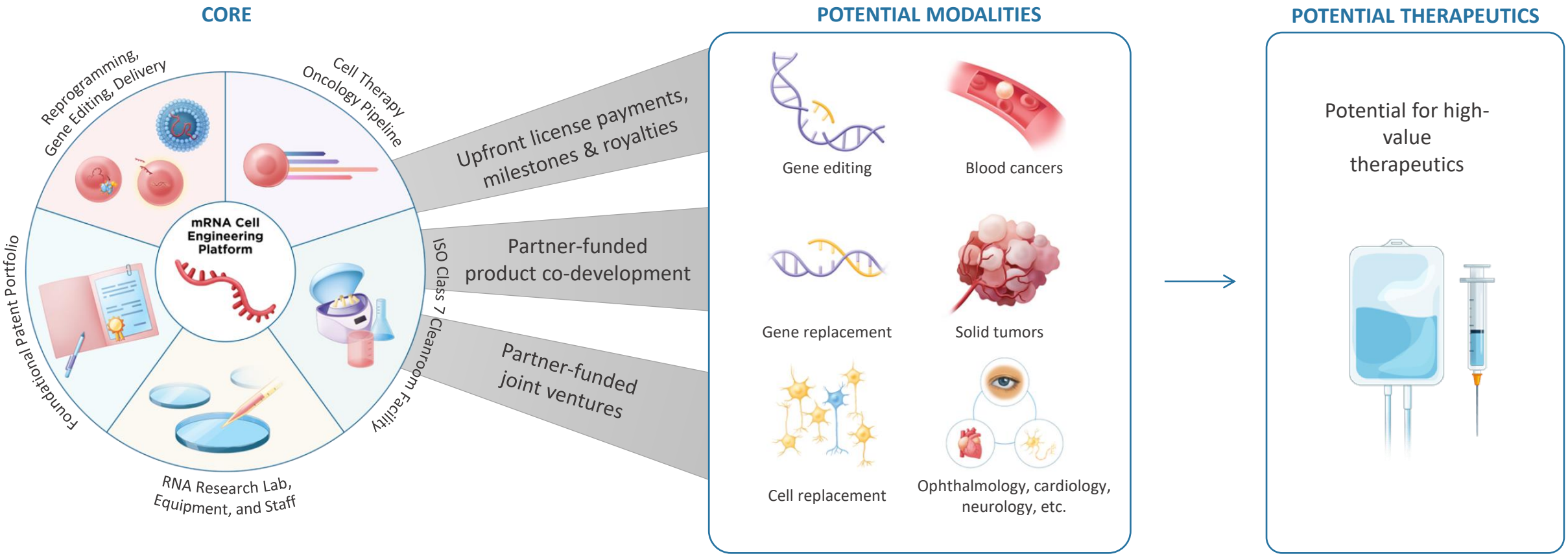
The Eterna Platform

Potential Advantages

- **Immunogenicity not expected**
- **Issues with off-target effects not expected**
- **Issues with genomic disruption not expected**
- **Efficient delivery**

Eterna's platform is novel and differentiated with the potential to overcome the challenges of industry standard cell engineering technologies

Partnership Strategy Offers Multiple Potential Paths to Revenue



RiboSlice™: Non-Viral, DNA-Free Targeted Gene Editing

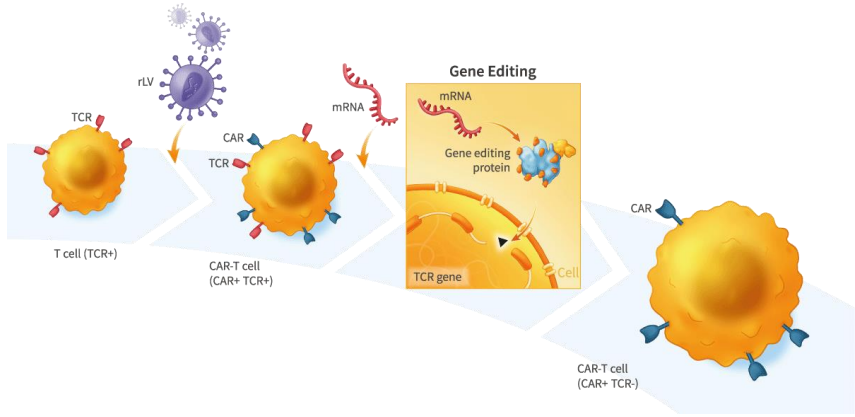
RiboSlice™: mRNA construct that encodes gene editing proteins

- mRNA transiently expresses high levels of gene editing proteins within cells
- Does not rely on viruses or DNA-based vectors
- Potential to enable efficient and effective single or multiplexed editing

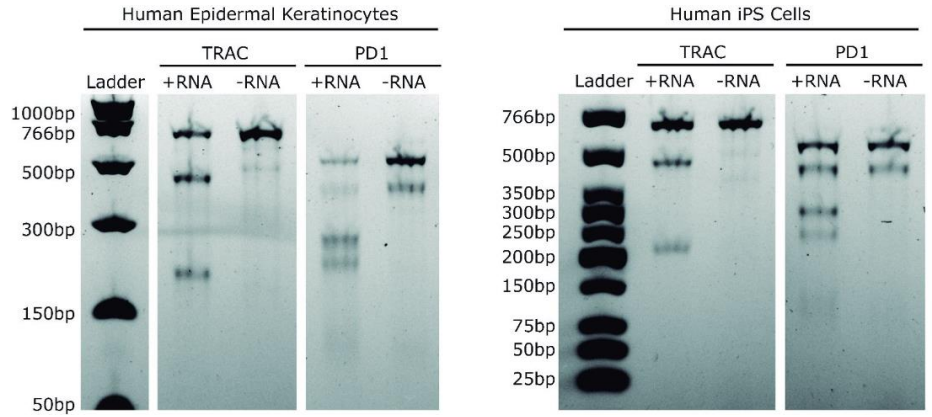
Example application: Allogeneic CAR-T

- RiboSlice™ used to knock out endogenous TCR to prevent therapeutic T cells from causing graft-versus-host disease (GvHD)
- RiboSlice™ mRNA can be delivered via ToRNAdo™ or electroporation
- CAR can be inserted using RiboSlice™ or traditional lentiviral approaches

Potential RiboSlice™ Application: Allogeneic CAR-T



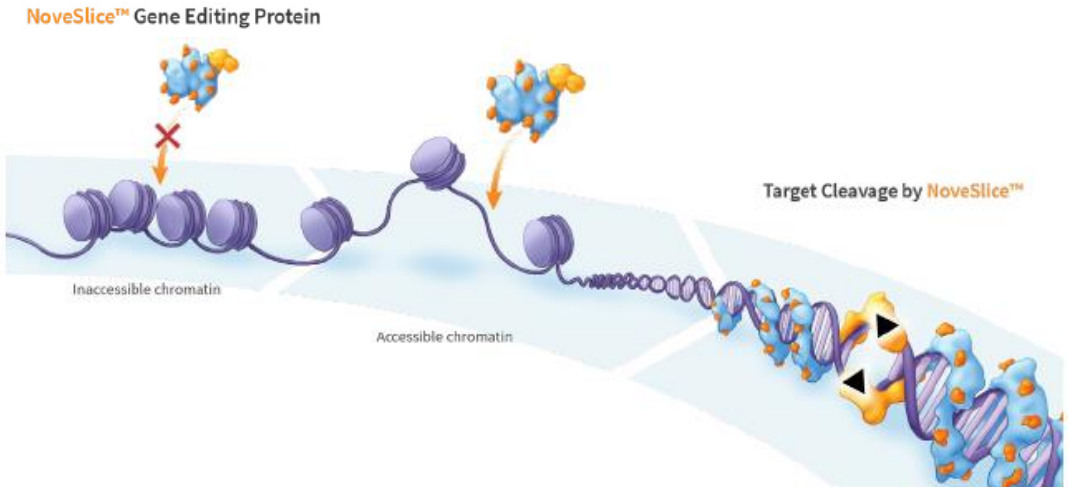
High-efficiency gene editing of TRAC and PD1 in human cells

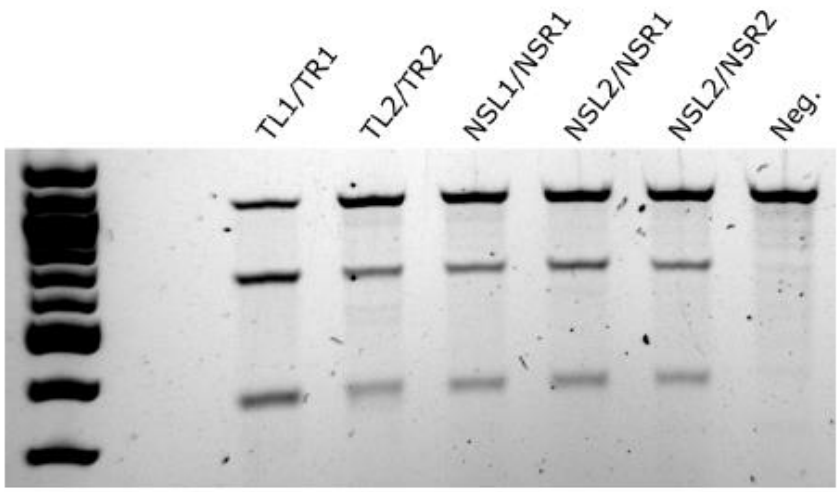


NoveSlice™: Chromatin Context Sensitive Gene-Editing Endonuclease

NoveSlice™: high specificity gene-editing endonuclease

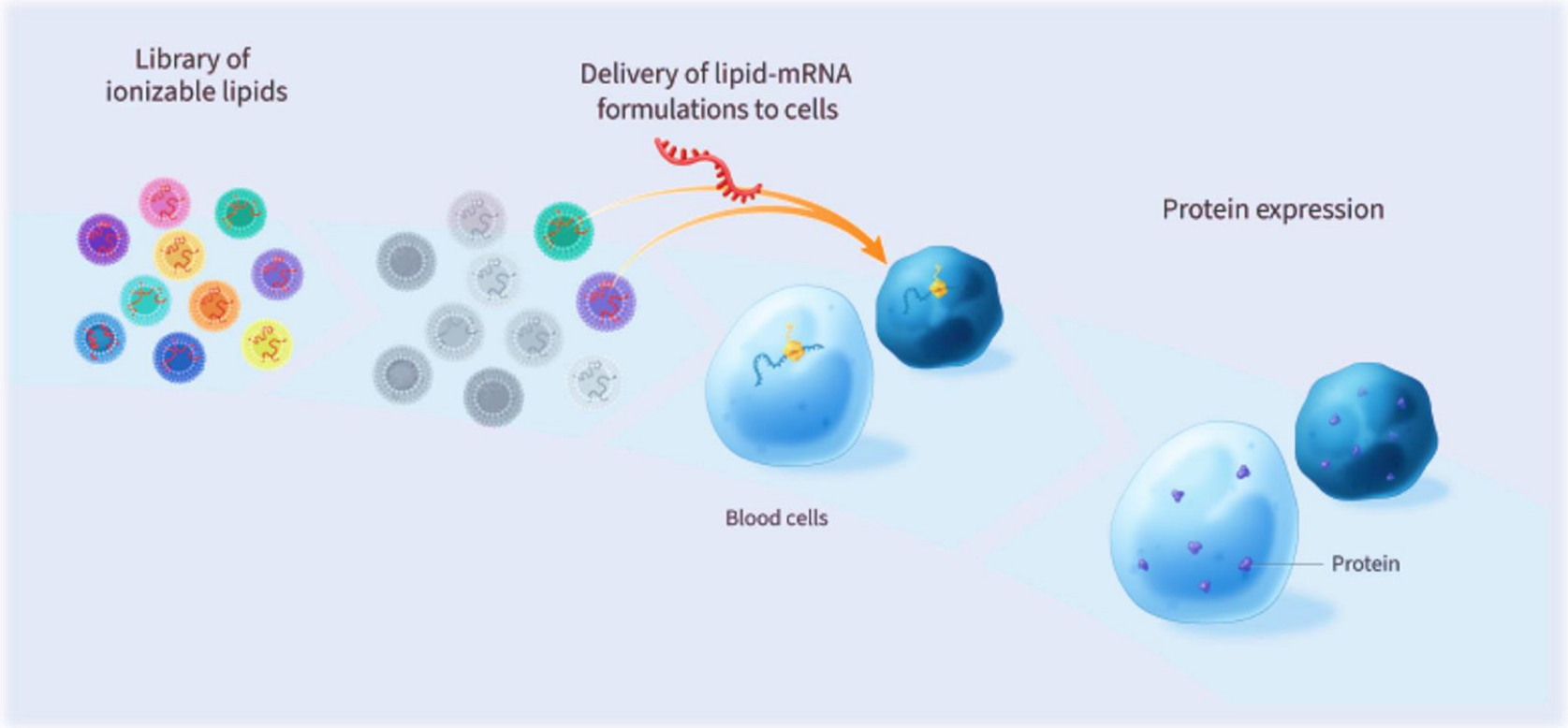
- Exhibits high efficiency on-target cutting and enhanced sensitivity to the chromatin context of the target site
- Designed with an array of DNA-binding repeat sequences connected by flexible linkers
- Designed to target cutting activity to actively expressed genes, with the potential to:
  - reduce off-target effects
  - minimize cellular toxicity
  - enable enhanced safety for future potential therapeutics





High-efficiency gene editing of the AAVS1 genomic safe harbor locus in human iPSCs

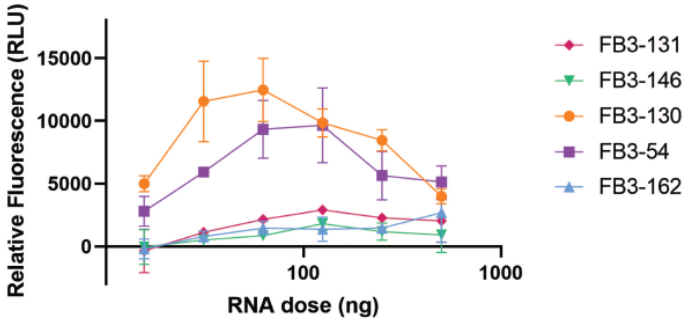
The Eterna Difference: Eterna's LNP Delivery is Customizable Through Its Library of Novel Ionizable Lipids



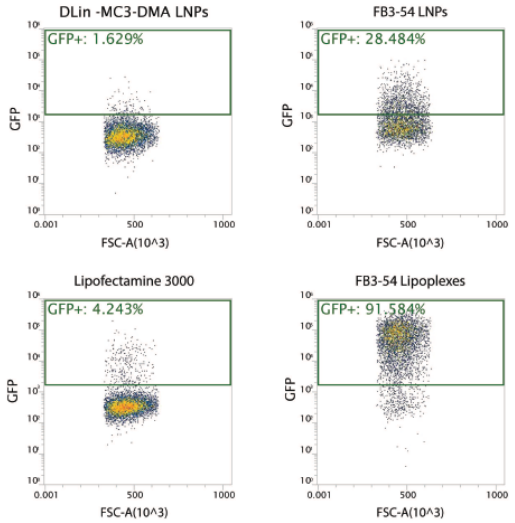
- Designed to effectively transfect cells
- Customizable constructs allow Eterna to vary the lipid head group, tail, and spacer link to fine tune the lipid transfection ability
- Exploring tropism for traditionally difficult to target tissues: heart, solid tumors, spleen, kidney

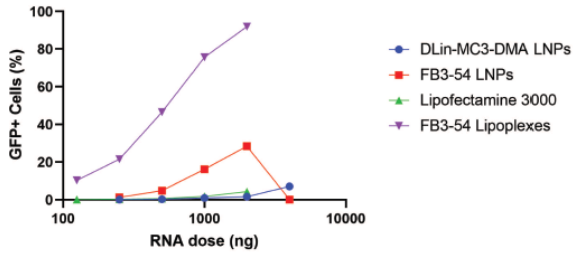
Ionizable Lipids Have Demonstrated Robust Transfection

Lipoplex Screen in THP-1 Monocytes



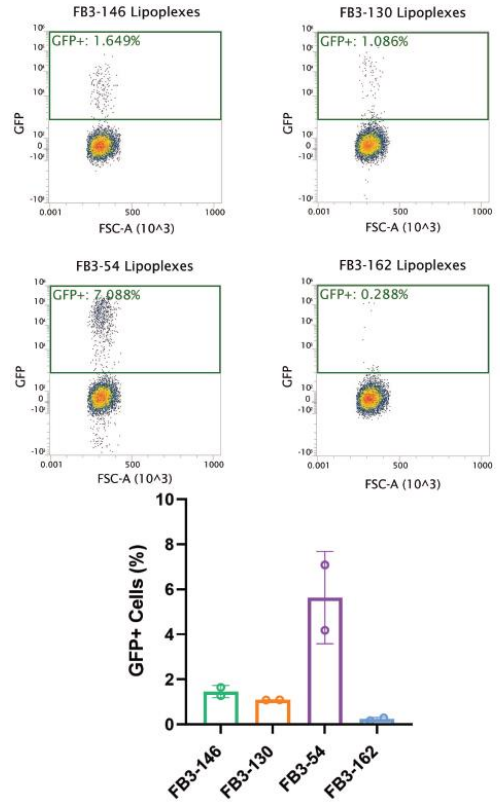
Transfection efficiency may be increased by fine tuning with only a few highly targeted edits to the structure





Eterna LNPs and lipoplexes exhibited greater *in vitro* transfection efficiency of THP-1 monocytes than commercially-available controls

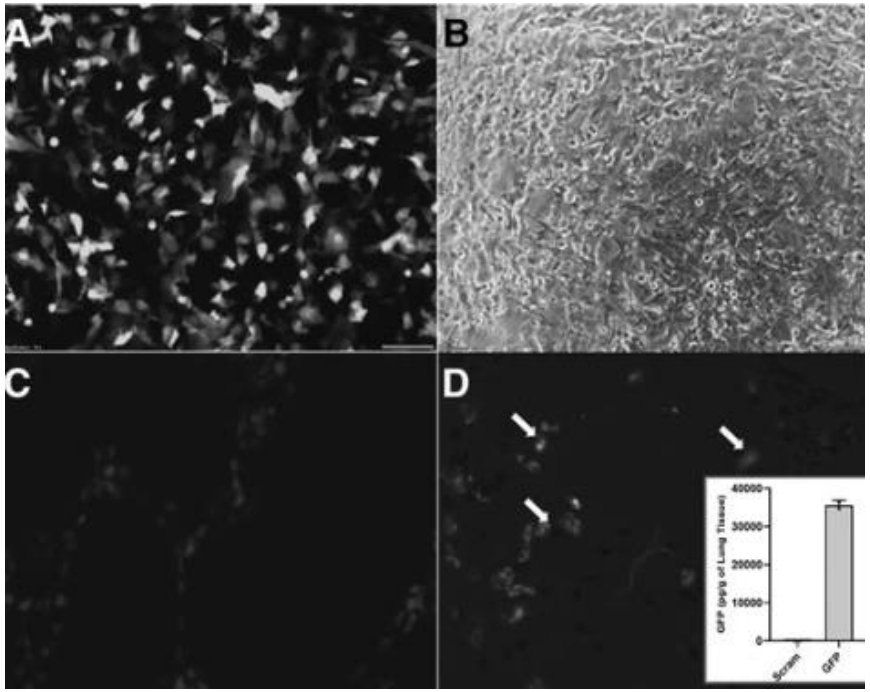
Jurkat T Cell Transfection

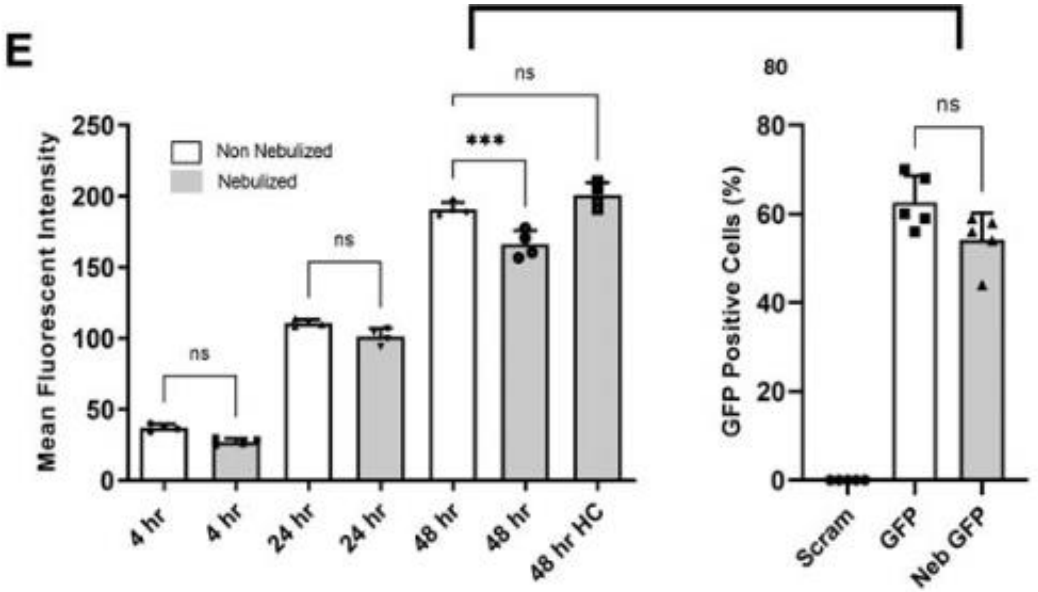


Transfection of Jurkat T cells

Eterna's mRNA Delivery Capabilities to Target the Lungs

Eterna's semisynthetic mRNA technology to reduce ARDS severity



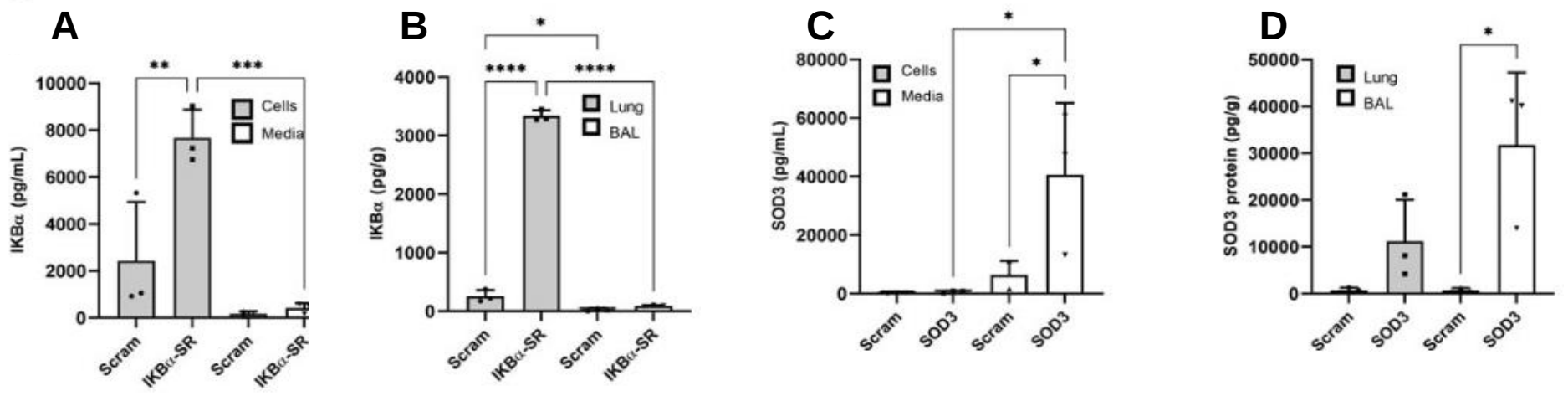


- Transgene expression observed as early as 4 h after transfection in BEAS2B cells treated with both nebulized and non-nebulized complexes and was maintained to at least 48 h(Figs. A–E)
- Fluorescent images of nebulized formulated mRNA 48 h after administration to the rat lung showed a clear pattern of GFP fluorescence in epithelial cells (Fig. D) and quantitative assessment showed GFP at a concentration of 35,000 pg/g of homogenized lung tissue
- Robust expression even at 48 h (Fig. E)

Aerosolized Pulmonary Delivery of mRNA Constructs Attenuates Severity of Escherichia coli Pneumonia in the Rat, Sean D. McCarthy, Christopher B. Rohde, Matt Angel, Claire H. Masterson, Ronan MacLoughlin, Juan Fandiño, Héctor E. González, Declan Byrnes, John G. Laffey, and Daniel O'Toole. Nucleic Acid Therapeutics 2023 33:2, 148-158

Eterna's mRNA Delivery Capabilities to Target the Lungs

IkBα and SOD3 expression significantly increased in vitro and in vivo in pulmonary cells administered respective complexes compared to those receiving scrambled mRNA control



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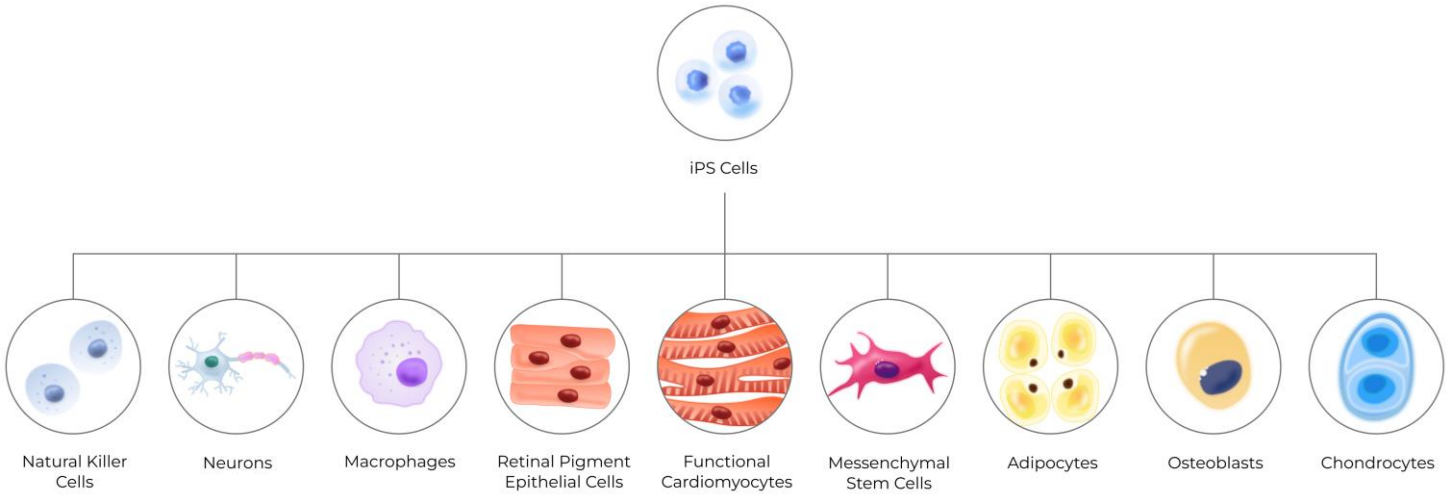
Platform to Address Challenges of Cell Reprogramming

Cell Reprogramming Challenges and Eterna Approach

Allogeneic “off-the-shelf” cell therapies can be a very powerful tool in treating a variety of diseases

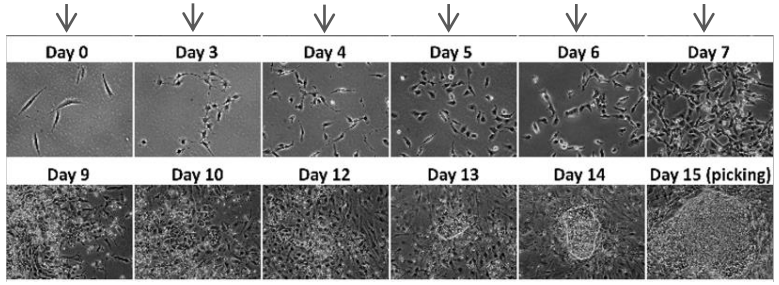
Eterna’s technology aims to address the challenges facing allogeneic “off-the-shelf” cell therapies including increasing the expansion potential and reducing the in vivo persistence by minimizing host immune rejection



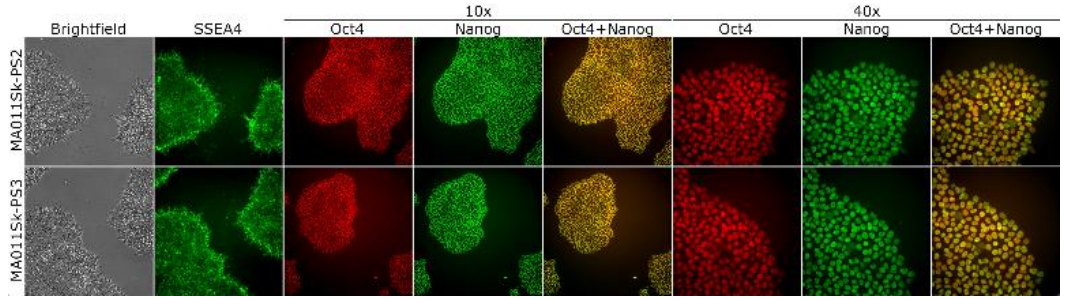
Eterna Technology Efficiently Reprograms Cells with mRNA to iPSCs that can Differentiate into Multiple Tissues and Cell Types

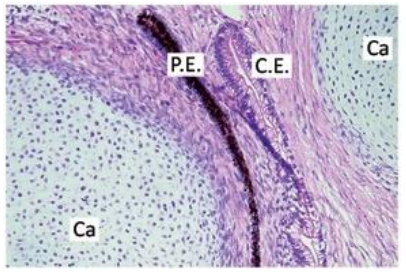
Clonal iPSC Lines Generated in 2 Weeks

mRNA Transfections with Eterna Technology



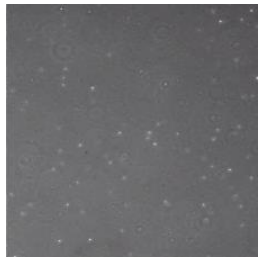
iPSC Markers for Confirmation



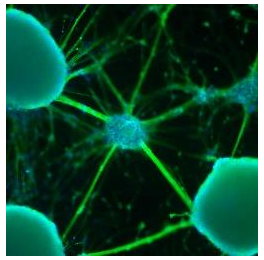


Verified iPSC Differentiation Potential

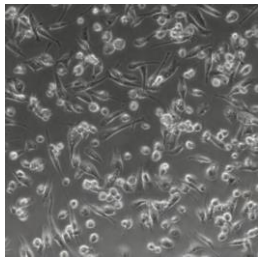
Natural Killer Cells



Neurons *β-tubulin*

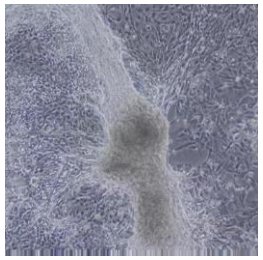


Macrophages

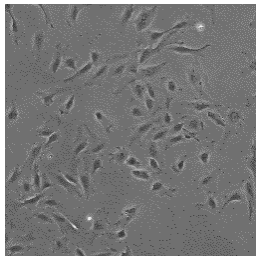


Retinal Pigment Epithelial Cells

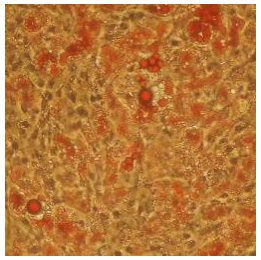
Functional Cardiomyocytes



Mesenchymal Stem Cells

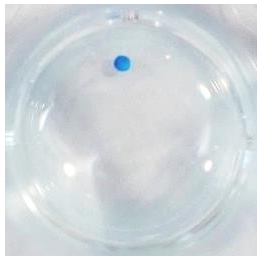


Adipocytes *Oil Red O stain*



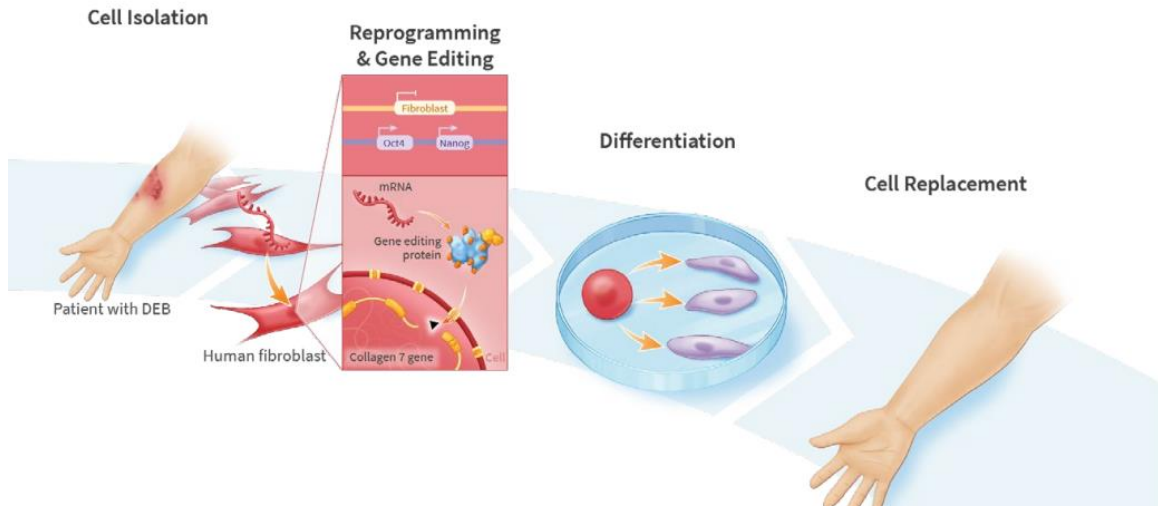
Osteoblasts *Alizarin Red S stain*

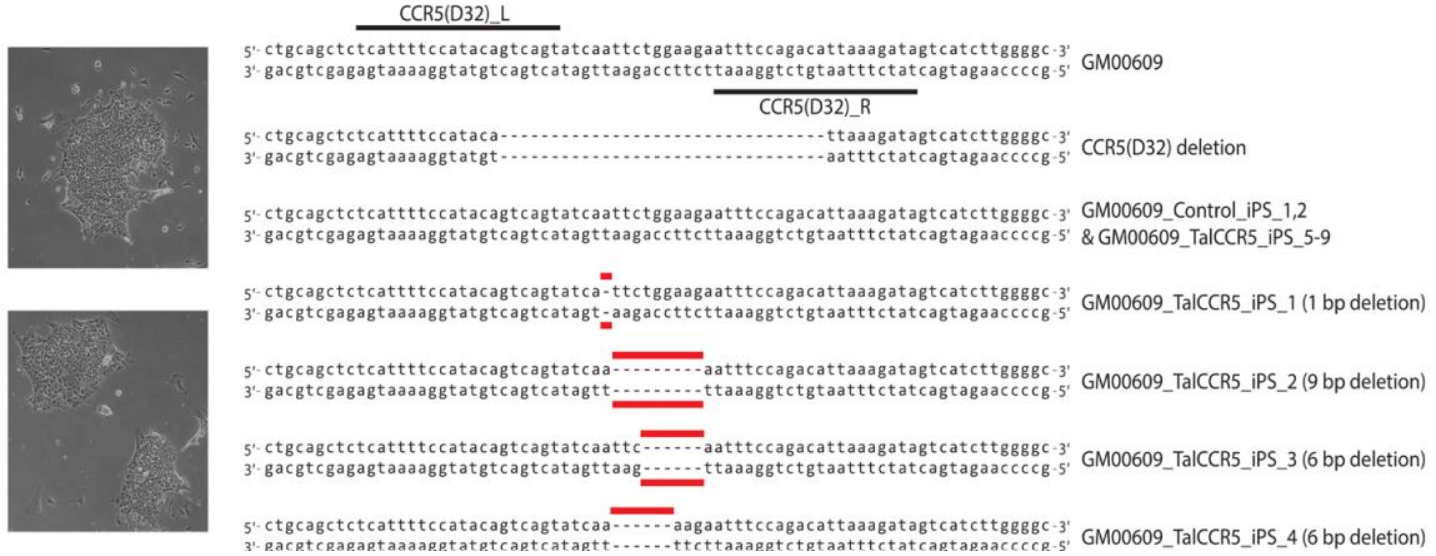
Chondrocytes *Alcian Blue stain*



Combined mRNA Gene Editing and Cell Reprogramming

- Demonstrated gene editing and dedifferentiation of human somatic cells in preclinical studies
- Successful demonstration of capability to generate clonal engineered pluripotent stem cell lines





Creation of pluripotent stem cell lines containing defined deletions in the CCR5 gene

Summary Highlights

- ✓ **Novel technologies** primed to generate value through collaborations and partnerships, and compete in **growing, multi-billion dollar markets**
- ✓ Partnership strategy is well positioned to **maximize several potential revenue streams** including upfront payments, milestones, royalties, and partner funded co-development and joint ventures
- ✓ **Gene editing and mRNA delivery** technology instrumental for R&D in cell engineering
- ✓ Technology is protected by a diligently prosecuted patent portfolio with over **130 granted patents**
- ✓ Corporate strategy designed to **maximize value of technologies and runway**, while ensuring continued progress for key activities