ADVANCED THERAPIES FOR INHERITED RETINAL DISEASES (IRDS)

Three therapeutic approaches originating from the Telethon Institute of Genetics and Medicine (TIGEM), an international reference center for research on genetic diseases. TIGEM has built a solid expertise in IRDs, a group of genetically heterogenic (over 250 causative genes) disorders affecting overall 2M people and with no available cure.

EXPANSE

Target Disease: Usher syndrome (MYO7A)

Problem: MYO7A gene exceeds AAV packaging capacity of 4.7 Kb

Solution: AAV Dual Vector System allows full-length MYO7A protein production

Development Stage: preclinical studies

Regulatory: ODD (EMA), scientific advise

Dual Vector System

5’ CDS + 3’ CDS

recombination & splicing

full length transcript

Key Features:
- Doubled expression cassette limit (up to 9 kb)
- Applicable to other IRDs (RP, LCA10)

References:
Trapani et al., EMBO Mol Med. 2014
Colella et al., Gene Ther. 2014

Patents:
WO2014/170480; WO2016/139321

SIRE

Target Disease: adRP (RHO mutations)

Problem: autosomal dominant disease caused by heterogeneous mutations

Solution: Silencing (DNA binding proteins) & Replacement - (Si-Re)

Development Stage: PoC in small and large animals

Regulatory: ODD (EMA)

Key Features:
- Mutation independent approach
- Single vector for Si-Re
- High potency and efficacy
- Safety
- Advantages over competition (siRNA, CRISPR/Cas9)
- Applicable to other diseases

References:
Mussolino et al., EMBO Mol Med. 2011
Botta et al., Elife. 2016

Patents:

MICROSAVE

Target Diseases: autosomal dominant Retinitis Pigmentosa (adRP-RHO mutations); LCA (Aipl1 mutations)

Problem: IRDs are heterogeneous

Solution: therapeutic miRNA protecting from retinal degeneration

Development Stage: PoC in 2 mouse models (adRP and LCA)

Key Features:
- Identified mode of action
- Expected incremental therapeutic effect in association with gene therapy
- No toxicity observed
- Potentially applicable to all retinal dystrophies

References:
Conte et al., PNAS 2015
Karali et al., IOVS. 2007

Patent:
WO2014/14005

THE TEAM: contribution to the first AAV-based gene therapy trial for an inherited retinal disease; consolidated expertise in AAV-based gene therapy, genetics of eye diseases, functional genomics/bioinformatics; 230 peer-reviewed publications; 13 patents families; 2 ERC grants

FONDAZIONE TELETHON: Italian charity funding strictly selected research in the field of rare and genetic diseases with the final goal of making therapies available to patients. Currently ongoing partnerships with GSK, Shire, Biomarine, Bioverativ and Editas. Telethon research led to the development of Strimvelis, first ex-vivo gene therapy to receive marketing authorization (alliance with GSK).

Fondazione Telethon is actively SEEKING INVESTORS to leverage its assets and develop cutting edge and safe therapies for IRDs

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