SEAL Therapeutics AG
Biozentrum, University of Basel
c/o Prof. Markus Rüegg, CEO
Spitalstrasse 41; CH-4056 Basel/Switzerland
www.sealtherapeutics.com
Twitter: @SEAL_Tx
Linkedin: SEAL-Therapeutics-AG

NEWS RELEASE

SEAL Therapeutics – new start-up at the Biozentrum, University of Basel, develops innovative gene therapy approach for muscular dystrophy

Basel, Switzerland, February 28, 2022 – The Biozentrum announced today its newest start-up, SEAL Therapeutics AG. The company's focus is on a proprietary gene therapy approach developed by Prof. Markus Rüegg and his team, which could be applied for LAMA2-related muscular dystrophy (LAMA2 MD), an inherited and severe form of muscular dystrophy that affects children and for which there is currently no treatment.

Founders of SEAL Therapeutics are Prof. Markus Rüegg and Dr. Judith Reinhard at the Biozentrum and Dr. Thomas Meier, former CEO of Santhera Pharmaceuticals. The company owns a proprietary gene therapy approach which allows the **s**imultaneous **e**xpression of **a**rtificial **l**inkers (SEAL) to alleviate the detrimental muscle wasting caused by the lack of laminin-α2 in the extracellular matrix of muscle fibers of LAMA2 MD patients.

"The preclinical results in mouse models for LAMA2 MD are very promising," said **Prof. Markus Rüegg, Co-Founder and CEO** of SEAL Therapeutics. "Our data clearly demonstrate that simultaneous expression of two specially designed linker proteins leads to sustained improvement in muscle histology, increased muscle mass and strength, improved body weight, and resulted in a remarkable increase in lifespan compared to untreated animals. We now aim to translate this technology for use in human LAMA2 MD patients as soon as possible."

Dr. Judith Reinhard, Co-Founder and CSO, commented: "Our comprehensive data show that the gene constructs enabling the simultaneous expression of these linker proteins can be delivered with conventional adeno-associated viral vectors, which have been successfully used as gene therapy delivery vehicles in human patients with neuromuscular diseases in recent years. This is a key achievement opening the door for clinical development."

"With the incorporation of SEAL Therapeutics, we licensed relevant intellectual property allowing us to now seek a pharmaceutical industry partner with expertise in gene therapy for neuromuscular diseases," commented **Dr. Thomas Meier, Co-Founder and Chairman of the Board.** "We plan to team up with such a partner to advance the SEAL technology through clinical development and towards regulatory approval."

About LAMA2 MD (Merosin-deficient congenital muscular dystrophy or MDC1A)

Congenital muscular dystrophies (CMDs) are a group of genetic muscle diseases with onset at birth or very early infancy, which cannot be treated. The more than 30 known forms of these neuromuscular diseases differ in the type of genetic defect and in the severity of disease progression. The muscles of the affected children progressively lose strength and degenerate over time. Progressive muscle weakness, joint contractures and respiratory insufficiency characterize most CMDs and patients often die before they reach adulthood.

Laminins are proteins of the extracellular matrix that are important in many tissues for the development, stability and survival of interacting cells. LAMA2-related muscular dystrophy (LAMA2 MD, also called MDC1A), is one of the most common forms of CMD. It is caused by mutations in the *LAMA2* gene encoding the α2 subunit of laminin-211, a protein that stabilizes muscle fibers. Children affected by LAMA2 MD usually suffer from poor muscle tone and strength already at birth, and are therefore called “floppy infants”. Most of the affected children never learn to walk independently. The respiratory muscles are also weak and continue to degenerate, resulting in organ failure.

About the Simultaneous Expression of Artificial Linker (SEAL) technology

The innovative gene therapy approach (called SEAL technology), developed by Prof. Rüegg and his team over the past 20 years, overcomes the lack of laminin-α2 in muscle tissue by providing molecular connections with other laminins and with the plasma membrane of the muscle fibers. Available data demonstrate that the simultaneous expression of two specifically designed linker proteins functionally corrects the primary pathology of laminin-α2 deficiency, leads to sustained improvement in muscle histology, increased muscle mass and strength, improved body weight, and results in a remarkable increase in life span compared to untreated animals [1-6].

About SEAL Therapeutics AG

SEAL Therapeutics AG, a spin-off of the Biozentrum of University of Basel, develops its proprietary SEAL technology as potential gene therapy treatment of LAMA2-related muscular dystrophy (LAMA2 MD; also called MDC1A). SEAL Therapeutics intends to team-up with and support a qualified pharma partner with experience in advanced gene therapy technologies for clinical development and registration with the ultimate goal to make this innovative treatment approach available to LAMA2 MD patients and their families.

References

[1] Moll, J., P. Barzaghi, S. Lin, G. Bezakova, H. Lochmuller, E. Engvall, U. Muller and M. A. Ruegg (2001). "An agrin minigene rescues dystrophic symptoms in a mouse model for congenital muscular dystrophy." Nature 413(6853): 302-307.

[2] Meinen, S., P. Barzaghi, S. Lin, H. Lochmuller and M. A. Ruegg (2007). "Linker molecules between laminins and dystroglycan ameliorate laminin-alpha2-deficient muscular dystrophy at all disease stages." J Cell Biol 176(7): 979-993.

[3] McKee, K. K., S. C. Crosson, S. Meinen, J. R. Reinhard, M. A. Ruegg and P. D. Yurchenco (2017). "Chimeric protein repair of laminin polymerization ameliorates muscular dystrophy phenotype." J Clin Invest 127(3): 1075-1089.

[4] Reinhard, J. R., S. Lin, K. K. McKee, S. Meinen, S. C. Crosson, M. Sury, S. Hobbs, G. Maier, P. D. Yurchenco and M. A. Ruegg (2017). "Linker proteins restore basement membrane and correct LAMA2-related muscular dystrophy in mice." Sci Transl Med 9(396).

[5] Reinhard, J., S. Lin, K. McKee, P. Yurchenco, and M. Ruegg (2020). “Gene therapy approach for LAMA2 related muscular dystrophy using linker proteins”. Neuromuscular Disorders 30, S103.

[6] Reinhard, J., S. Lin, and M. Ruegg, (2021). “Therapeutic effect of linker protein-mediated gene therapy in a mouse model for LAMA2-related muscular dystrophy". Neuromuscular Disorders 31, S70.

Contact

Prof. Markus A. Rüegg, CEO
markus-a.ruegg@unibas.ch
www.sealtherapeutics.com
Twitter: @SEAL_Tx
Linkedin: SEAL-Therapeutics-AG

# # #