

PRESS RELEASE

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February, 20. 2018 || Page 1

ENDOSCAPE – a new EU project aims for a clinically applicable non-viral gene delivery technology

The Fraunhofer Institute for Molecular Biology and Applied Ecology IME participates in the EU-funded ENDOSCAPE project, a research and innovation action that develops a novel gene delivery technology. ENDOSCAPE is a 6.8 M€ H2020 EU project coordinated by scientists at the Charité in Berlin with participation of 12 industrial and academic partners from 7 European countries.

Gene therapy is one of the most promising treatment options for future advanced therapies in a broad range of diseases. Successful gene delivery requires the recognition of target cells as well as cytosolic and nucleosolic uptake of the gene. Currently, non-viral based gene delivery such as transfection reagents are only suitable for in vitro applications and clinical gene therapeutics delivery is accomplished via viral vectors, which still has major safety concerns and complex and costly manufacturing procedures, preventing future implementation for the treatment of diseases with large patients groups.

In the last 15 years, a class of secondary plant metabolites has been discovered that selectively mediates endosomal escape and cytoplasmic delivery of macromolecules only at low endosomal pH, thereby inducing a 40-fold enhanced gene delivery efficacy, in vivo. The currently employed methods of applying endosomal escape enhancers and gene therapeutic product, however, do not ensure that both compounds are at the same time at the site of interaction.

The ENDOSCAPE technology platform will develop and collect proof of concept for a non-viral gene delivery technology with increased synchronization (in time and place) of both compounds. Proof of concept of the ENDOSCAPE technology has a major impact on the therapeutic opportunities for current and future macromolecule drugs for a broad range of diseases.

At Fraunhofer IME Prof. Stefan Schillberg and his team will have an important contribution to ENDOSCAPE by optimizing and scaling up production of endosomal endoscape enhancers in plants. ENDOSCAPE, which was launched in January 2019 in Berlin, is a 4-year project funded by the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 825730.

Funded by the European Union



Editorial notes

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