Docket #: S20-135

Translation Enhancer for Gene Regulation

Stanford researchers have developed one of the smallest, active translational enhancers that can be adapted to control gene regulation. The translation enhancer is a short RNA stem-loop structure isolated from a Hox gene. It can be used to increase the translation efficiency of any mRNA when used upstream of a spacer sequence and placed into any 5'UTR. For example, it may increase translation of any mRNA-based vaccine that needs to be highly expressed in the cell upon delivery, reducing the total required amount and number of repeat deliveries of mRNA to the patient. This is an attractive system for biotechnology applications such as RNA-based viral delivery or expression requiring large amounts of protein synthesized.

Applications

- Increasing mRNA translation
- Increasing translation of any mRNA-based vaccine
- Modular small RNA stem-loop in the mRNA 5' UTR enhances translation of any mRNA
- COVID-19 mRNA vaccine design
- RNA-based viral delivery or expression requiring large amounts of protein synthesized

Advantages

- Transferrable to any reporter gene or mRNA of interest
- Enables reduction in the amount of delivered mRNA/reagents to patients

Publications

- Leppek et al. bioRxiv (2021) Combinatorial optimization of mRNA structure, stability, and translation for RNA-based therapeutics

Patents

- Published Application: WO2021231502
- Published Application: 20240002864

Innovators

- Maria Barna
- Kathrin Leppek

Licensing Contact

Sam Rubin

Licensing Associate, Life Science

Email