Developing an RNA sequence designer for targeted translation

Landau Yehuda, Moree Efi, Arbel Matan, Tuller Tamir
Department of Biomedical Engineering, Tel Aviv University
yehudalandau@mail.tau.ac.il

The use of mRNA as a therapeutic tool is a new frontier in the broad view of disease treatment and prevention. One of the big challenges it still faces is cell-specificity. A way to address this challenge is by building cell-selective vehicles, which deliver the RNA molecule only to a specific tissue. While creative and promising, specific delivery is far from ideal as it must be developed anew for each specific goal and is not always applicable. We aim to address this from a different perspective - utilizing the secondary structure of RNA molecules. We used several algorithms to develop a computational models-based tool for designing Toehold switches in a generic manner. Our user-friendly software tool enables the automatic generation of Toeholds for various organisms, and it could be used for different applications and adjusted for various settings.