

## Characterization of telomerase machinery units in Brassicaceae family

Научный руководитель – Severinov Konstantin

*Polkhovskiy Alexander Vladimirovich*

*Student (master)*

Сколковский институт науки и технологий, Москва, Россия

*E-mail: polkhovsky.a.w@gmail.com*

Telomeres - special chromosome terminal structures are used to protect coding regions from consecutive loss of chromosome length due to end-replication problem. Enzyme called telomerase is summoned to reconstruct them. Telomerase is ribonucleoprotein which consists of two main units - Telomerase RNA (TER) and Telomerase Reverse Transcriptase (TERT) [2]. Telomerase Reverse Transcriptase in complex with RNA binds to the end of telomeres accordingly to sequence of the RNA with help of accessory proteins [1]. TERT uses Telomerase RNA as a template to reconstruct the length of telomeres. Before complex assembly with TERT, TER forms a special secondary structure with several functional regions such as pseudoknot, template region and various stem loops, which are needed for interaction with Reverse Transcriptase or other proteins [3]. This complex as well as its' accessory factors are studied in detail in mammals, but not in plants. In this particular study we sought to bring the light on one of the main units of Telomerase enzyme - Telomerase RNA. Here we give multiple evidences which prove that a previously found gene in *Arabidopsis thaliana* codes for real TER. We also provide data about its' possible secondary structure, functional regions and stability between different species inside the *Brassicaceae* family.

### References

- 1) Cifuentes-Rojas C., Kannan K., Tseng L., Shippen D. Two RNA subunits and POT1a are components of Arabidopsis telomerase // PNAS, 2011. 108:1, 73–78.
- 2) Smogorzewska A. Regulation of telomerase by telomeric proteins // Annual Review of Biochemistry. 2004. 73:177–208.
- 3) Webb C., Zakian V. Telomerase RNA is more than a DNA template // RNA Biology, 2016. 13:8, 683-689.