

## Abstract

Translation is one of the key mechanisms occurring in the cell during every second of its existence. It is a very complex process ensured by three main actors: tRNAs, mRNAs and ribosomes. Despite of being thoroughly studied over decades, the understanding of some of its functional aspects is still rather poor. This bachelor thesis focuses on four small ribosomal proteins listed below that are reaching to the decoding centre of the small ribosomal subunit. It raises awareness of the structure and function of uS12, uS19, eS25 and eS30, their evolution, role within the ribosome, and the influence they have on various stages of translation. In particular, this thesis specifically reviews the importance of these four proteins for the stop codon readthrough. This phenomenon occurs when a near-cognate aminoacyl-tRNA or a natural suppressor tRNA wins with eRF1 over the corresponding stop codon and thus protein synthesis is continued resulting in the existence of a longer protein.

It summarizes our current knowledge of its origin, molecular details of its mechanism, its existence in different species, benefits and disadvantages it brings to the life of a cell or even an organism, and finally it sums up all available knowledge for potential future use of readthrough in therapeutics.

Key words: translation, stop codon readthrough, ribosome, ribosomal proteins, uS12, uS19, eS25, eS30