

Abstract

Transcription and translation are key steps in gene expression. The RNA polymerase (RNAP) plays a major role in the transcription process, while the ribosome is involved in translation. In bacteria, these two processes are not separated. RNAP and the ribosome interact, and its called transcription-translation coupling.

In this thesis, I discuss the mechanism of transcription and translation, with the main focus on transcription-translation interactions. I divide these interactions into indirect, which are caused by regulat3ry molecules, and direct, where the ribosome directly binds with RNAP. When physical binding occurs, either a tight junction between these molecules occurs or a bridge is formed by transcription factors. Then I describe regulatory function of this connection and explain the exceptions where transcription and translation don't link. In the last part of the thesis, I focus on elongation factor Tu (EF-Tu), its important role in metabolism, its interactions with MreB protein, and how this factor is used by some bacteriophages. Finally, I mention its possible role in transcription-translation interactions.

Key words: transcription, translation, transcription-translation coupling, RNA polymerase, ribosome, transcription factors, EF-Tu