

*Transcription and RNA Processing: So, in Eukaryote, they have each corresponding RNA polymerase responsible for different types of RNAs; for example, tRNA is transcribed by RNA polymerase 1. These different polymerase recognize the specific but different promoter region with the help of Transcription Factors. My question is, in Bacteria, there is only one promoter region (-10 and -35), then how a bacteria transcribes different types of RNAs, like tRNA, mRNA and rRNA? (Is the core enzyme special that it can produce all those different types of RNAs?...I don't think so though.)*

Actually, bacteria really do only have one RNA Polymerase core enzyme, and there is one sigma factor that transcribes the vast majority of genes required for cellular survival (including tRNAs, rRNAs, and many mRNAs). This goes beyond the scope of the class, but E. coli has seven different sigma factors, but six of the seven are required for transcribing genes that are not always on (e.g. genes required during survival in nitrogen limiting conditions). Sigma70 is the main sigma factor in E. coli that is involved in transcribing "housekeeping genes" (so genes required for survival under "normal" conditions). For the purposes of this class, there is one RNAP core enzyme and one sigma factor involved in bacterial transcription of mRNA, tRNAs and rRNAs.

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