Homework 1

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Problem 1

For the following mRNA sequence, can you extract its 5' UTR, 3' UTR and the protein sequence? ACTTGTCATGGTAACTCCGTCGTACCAGTAGGTCATG

So the above is actually DNA, despite what the question says. I assume it is oriented 5' → 3' So we transcribe it into:

3' UGAACAGUACCAUUGAGGCAGCAUGGUCAUCCAGUAC 5'

We translate it 5' → 3', so we need to flip it.

CAUGACCUACUGGUACGACGGAGUUACCAUGACAAGU

The start codon is AUG (Met), so the 5' UTR is everything left of this: which in this case is just C

We then translate, AUGGUCAUCCAGUAC → MET, THR, TYR, TRP, TYR, ASP, GLY, VAL, THR, MET, THR, SER

We don't have a stop codon. So there is no UTR on the 3' end, and translation stops by hitting the end of the sequence.