

## PREVERJANJE ZNANJA PRI VAJAH IZ BIOINFORMATIKE

NAVODILA ZA REŠEVANJE:

Čas reševanja je 45 min (+ 5 min)

### 1. Določila si naslednje nukleotidno zaporedje:

TGTTTTCCGCTGCATCCAGACTTCCTCAGGCGGTGGCTGGAGGCTGCGCATCTGGGGCTTTAAACATACAA  
AGGGATTGCCAGGACCTGCGGCGGCGGCGGCGGCGGGGGCTGGGGCGGGGGGCCGGACCATGAGCC  
GCTGAGCCGGGCAAACCCAGGCCACCGAGCCAGCGGACCCTCGGAGCGCAGCCCTGCGCCGCGGACCAG  
GCTCCAACCAGGCGGCGAGGCGGCCACACGCACCGAGCCAGCGACCCCGGGCGACGCGCGGGGCCAGGG  
AGCGCTACGATGGAGGCGCTAATGGCCCCGGGGCGCGCTCACGGGTCCCCTGAGGGCGCTCTGTCTCCTGG  
GCTGCCTGCTGAGCCACGCCGCGCCGCGCCGTCGCCATCATCAAGTTCCCCGGCGATGTGCCCCCAA  
AACGGACAAAGAGTTGGCAGTGCAATACCTGAACACCTTCTATGGCTGCCCAAGGAGAGCTGCAACCTG  
TTTGTGCTGAAGGACACACTAAAGAAGATGCAGAAGTTCTTTGGACTGCCCCAGACAGGTGATCTTGACC  
AGAATACCATCGAGACCATGCGGAAGCCACGCTGCGGCAACCCAGATGTGGCCAACTACAACCTTCTCCC  
TCGCAAGCCCAAGTGGGACAAGAACCAGATCACATACAGGATCATTGGCTACACACCTGATCTGGACCCA  
GAGACATGGATGATGCCTTTGCTCGTGCCTTCCAAGTCTGGAGCGATGTGACCCACTGCGGTTTTCTC  
GAATCCATGATGGAGAGGCGAGACATCATGATCAACTTTGGCCGCTGGGAGCATGGCGATGGATACCCCTT  
TGACGGTAAGGACGGACTCCTGGCTCATGCCTTCGCCCCAGGCACTGGTGTTGGGGGAGACTCCCATTTT  
GATGACGATGAGCTATGGACCTTGGGAGAAGGCCAAGTGGTCCGTGTGAAGTATGGCAACGCCGATGGGG  
AGTACTGCAAGTTCCCCTTCTTGTTCATGGCAAGGAGTACAACAGCTGCACTGATACTGGCCGACGCGA  
TGGCTTCTCTGGTGTCCACCACCTACAACCTTTGAGAAGGATGGCAAGTACGGCTTCTGTCCCCATGAA  
GCCCTGTTACCATGGGCGGCAACGCTGAAGGACAGCCCTGCAAGTTTCCATTCCGCTTCCAGGGCACAT  
CCTATGACAGCTGCACCACTGAGGGCCGCACGGATGGCTACCGCTGGTGCGGCACCACTGAGGACTACGA  
CCGCGACAAGAAGTATGGCTTCTGCCCTGAGACCGCCATGTCCACTGTTGGTGGGAACCTCAGAAGGTGCC  
CCCTGTGTCTTCCCCTTCACTTTTCTGGGCAACAAATATGAGAGCTGCACCAGCGCCGGCCGCACTGACG  
GAAAGATGTGGTGTGCGACCACAGCCAACCTACGATGACGACCGCAAGTGGGGCTTCTGCCCTGACCAAGG  
GTACAGCCTGTTCTCGTGGCAGCCCACGAGTTTGGCCACGCCATGGGGCTGGAGCACTCCCAAGACCCT  
GGGGCCCTGATGGCACCCATTTACACCTACACCAAGAACCTCCGTCTGTCCCAGGATGACATCAAGGGCA  
TTCAGGAGCTCTATGGGGCCTCTCCTGACATTGACCTTGGCACCGGCCCCACCCCCACACTGGGCCCTGT  
CACTCCTGAGATCTGCAAACAGGACATTGTATTTGATGGCATCGCTCAGATCCGTGGTGGATCTTCTTC  
TTCAAGGACCGGTTCAATTTGGCGGACTGTGACGCCACGTGACAAGCCCATGGGGCCCTGTGGTGGCCA  
CATTCTGGCCTGAGCTCCCGAAAAGATTGATGCGGTATACGAGGCCCCACAGGAGGAGAAGGCTGTGTT  
CTTTGCAGGGAATGAATACTGGATCTACTCAGCCAGCACCCCTGGAGCGAGGGTACCCCAAGCCACTGACC  
AGCCTGGGACTGCCCCCTGATGTCCAGCGAGTGGATGCCGCCTTTAACTGGAGCAAAAACAAGAAGACAT  
ACATCTTTGCTGGAGACAAATTTGGAGATAACAATGAGGTGAAGAAGAAAATGGATCCTGGCTTTCCCAA  
GCTCATCGCAGATGCTGGAATGCCATCCCCGATAAACCTGGATGCCGTCTGGACCTGCAGGGCGGCGGT  
CACAGCTACTTCTCAAGGGTGCCTATTACCTGAAGCTGGAGAACCAAAGTCTGAAGAGCGTGAAGTTTG  
GAAGCATCAAATCCGACTGGCTAGGCTGCTGAGCTGGCCCTGGCTCCCACAGGCCCTTCTCTCCACTGC  
CTTCGATACACCGGGCCTGGAGAAGTACAGAGAGGACCCGGAGGGGCTGGCAGCCGTGCCTTCAGCTCTA  
CAGCTAATCAGCATTCTCACTCCTACCTGGTAATTTAAGATTCCAGAGAGTGGCTCCTCCCGGTGCCCAA  
GAATAGATGCTGACTGTACTCCTCCCAGGCGCCCCTTCCCCTCCAATCCCACCAACCCTCAGAGCCACC  
CCTAAAGAGATCCTTTGATATTTTCAACGCAGCCCTGCTTTGGGCTGCCCTGGTGTGCCACACTTCAGG  
CTCTTCTCCTTTACAACCTTCTGTGGCTCACAGAACCCTTGGAGCCAATGGAGACTGTCTCAAGAGGGC  
ACTGGTGGCCCGACAGCCTGGCACAGGGCAGTGGGACAGGGCATGGCCAGGTGGCCACTCCAGACCCCTG  
GCTTTTCACTGCTGGCTGCCTTAGAACCTTTCTTACATTAGCAGTTTGTCTTGTATGCACTTTGTTTTT  
TCTTTGGGTCTTGTTTTTTTTTTCCACTTAGAAATTGCATTTCTGACAGAAGGACTCAGTTGTCTGAA  
GTCACTGCACAGTGCATCTCAGCCACATAGTGATGGTTCCCCTGTTCACTCTACTTAGCATGTCCCTAC  
CGAGTCTCTTCTCCACTGGATGGAGGAAAACCAAGCCGTGGCTTCCCGCTCAGCCCTCCCTGCCCTCCC  
TTCAACCATTCCCACATGGGAAATGTCAACAAGTATGAATAAAGACACCTACTGAGTGGC

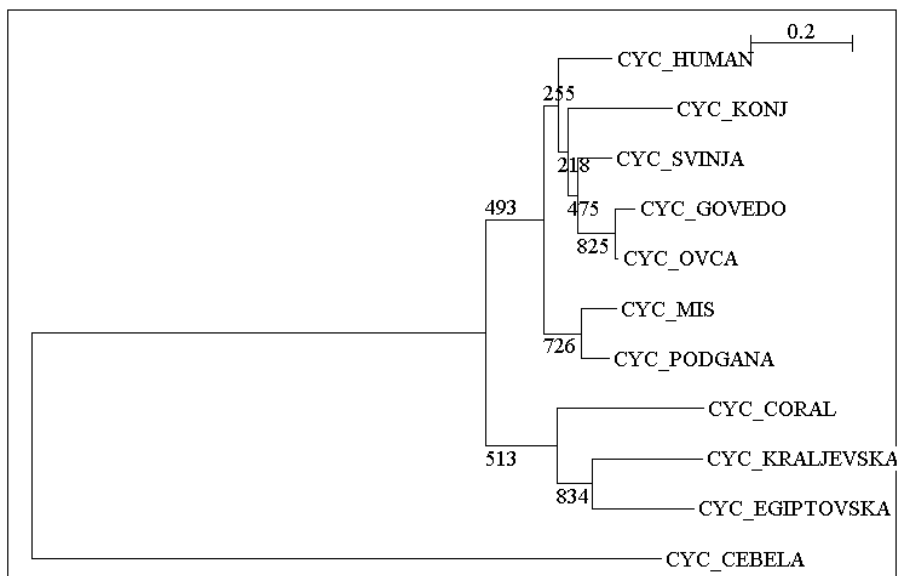
a) Koliko odprtih bralnih okvirjev ima to nukleotidno zaporedje? Katere predstavlja kodirajočo regijo?

ORF: A section of a sequenced piece of DNA that begins with an initiation (methionine ATG) codon and ends with a nonsense codon. ORFs all have the potential to encode a protein or polypeptide, however many may not actually do so.

**b) Kakšna je izoelektrična točka proteina, ki ga kodira zgornje nukleotidno zaporedje?**

**c) Poišči, kateremu človeškemu proteinu ustreza.**

**2. S pomočjo filogenetskega drevesa ugotovi, protein iz katerega organizma se najbolj razlikuje od vseh ostalih podobnih proteinov.**



**3. Za dano aminokislinsko zaporedje ugotovi, kakšen odstotek bazičnih in kislin aminokislin vsebuje?**

Zaporedje je navedeno v dokumentu v Excelu.

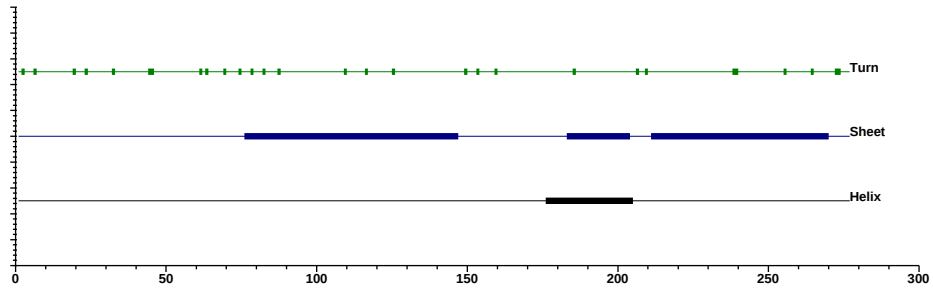
**4. Molekulo papaina (datoteka s koordinatami 9PAP na vašem direktoriju) predstavite v obliki ribbon, ki je obarvana glede na sekundarno strukturo. Na tej sliki prikažite stranske skupine aminokislinskih ostankov Cys25, His159 in Asn175. Izmerite in prikažite razdaljo med Cys25 in His159. Sliko shranite pod imenom naloga2.tga, najprej na trdi disk, nato pa jo skrčite na disketo.**

5. a) Kaj predstavlja najdaljši odprti bralni okvir?

b) Za kateri protein (A ali B) je predstavljen?

A

*Chou-Fasman*



B

*Garnier-Robson*

