**Version 07/04/2022**

1. **Work with the following sequence obtained after sequencing (also in Moodle):**

TACTGTTTTCGTACAGTTTTGTAATAAAAAAACCTATAAATATTCCGGATTATTCATACCGTCCCACCAT

CGGGCGCGGATCTTTTTATCTAGCATAGCCAAAAAGAAAGAGCTTGCACATATGGAGAGATCAAACAGCA

CAGCTTCTATGGCCGTGCAAGAACTTCACCATGGAGCTATGGAGATTATGATAATTGCCAACAGGATCAT

GATTATCTTCTAGGGTTTTCATGGCCACCAAGATCCTACACTTGCAGCTTCTGCAAAAGGGAATTCAGAT

CGGCTCAAGCACTTGGTGGCCACATGAATGTTCACAGAAGAGACAGAGCAAGACTCAGATTACAACAGTC

TCCATCATCATCTTCAACACCTTCTCCTCCTTACCCTAACCCTAATTACTCTTACTCAACCATGGCAAAC

TCTCCTCCTCCTCATCATTCTCCTCTAACCCTATTTCCAACCCTTTCTCCTCCATCCTCACCAAGATATA

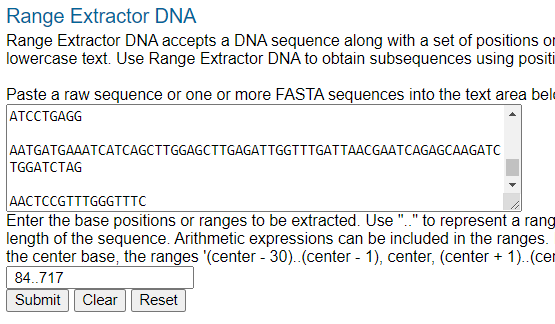
GGGCAGGTTTGATCCGTTCCTTGAGCCCCAAGTCAAAACATACACCAGAAAACGCTTGTAAGACTAAGAA

ATCATCTCTTTTAGTGGAGGCTGGAGAGGCTACAAGGTTCACCAGTAAAGATGCTTGCAAGATCCTGAGG

AATGATGAAATCATCAGCTTGGAGCTTGAGATTGGTTTGATTAACGAATCAGAGCAAGATCTGGATCTAG

AACTCCGTTTGGGTTTC

* Determine if this sequence is contaminated with vector, rewrite the purified sequence in FASTA format. 



>purified sequence

TTTTATCTAGCATAGCCAAAAAGAAAGAGCTTGCACATATGGAGAGATCAAACAGCACAG

CTTCTATGGCCGTGCAAGAACTTCACCATGGAGCTATGGAGATTATGATAATTGCCAACA

GGATCATGATTATCTTCTAGGGTTTTCATGGCCACCAAGATCCTACACTTGCAGCTTCTG

CAAAAGGGAATTCAGATCGGCTCAAGCACTTGGTGGCCACATGAATGTTCACAGAAGAGA

CAGAGCAAGACTCAGATTACAACAGTCTCCATCATCATCTTCAACACCTTCTCCTCCTTA

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TCTAACCCTATTTCCAACCCTTTCTCCTCCATCCTCACCAAGATATAGGGCAGGTTTGAT

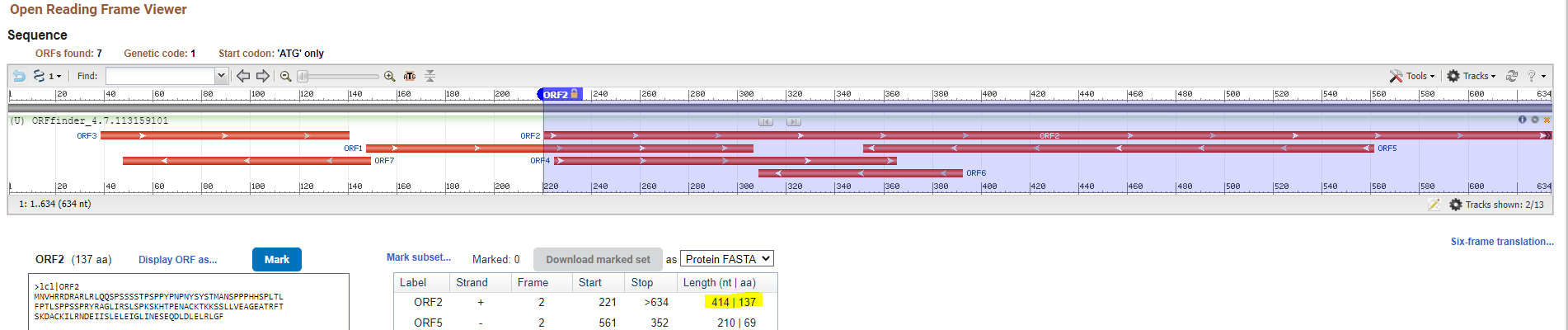
CCGTTCCTTGAGCCCCAAGTCAAAACATACACCAGAAAACGCTTGTAAGACTAAGAAATC

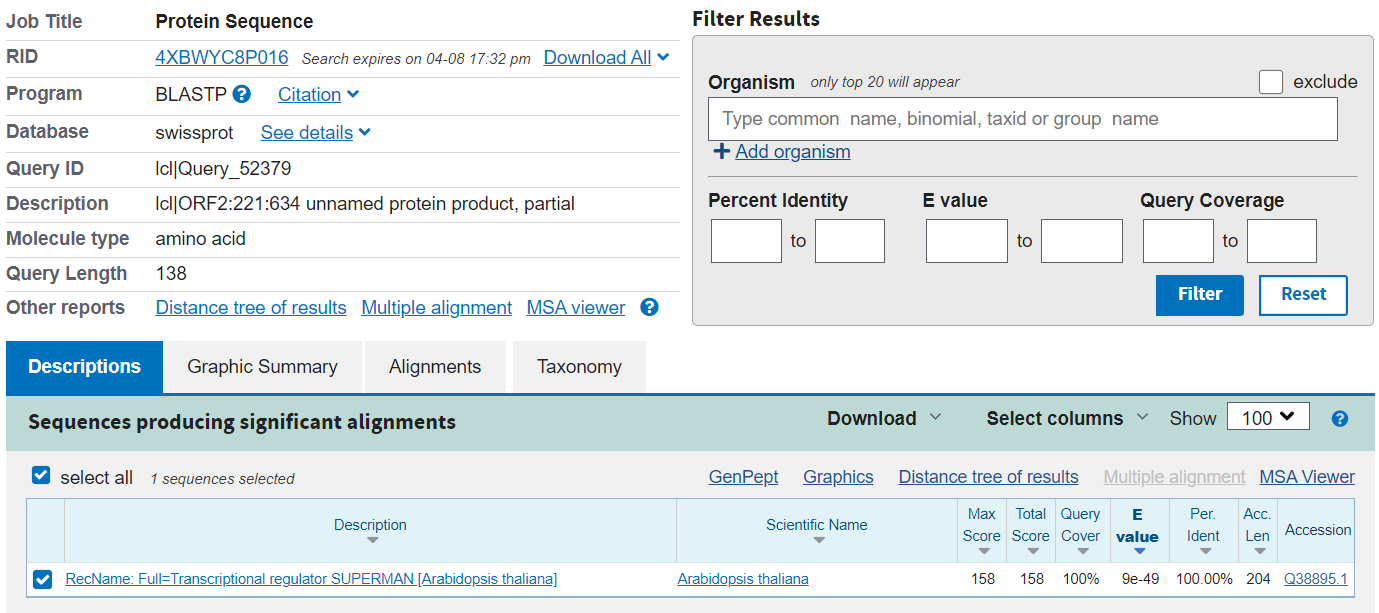
ATCTCTTTTAGTGGAGGCTGGAGAGGCTACAAGGTTCACCAGTAAAGATGCTTGCAAGAT

CCTGAGGAATGATGAAATCATCAGCTTGGAGCTTGAGATTGGTTTGATTAACGAATCAGA

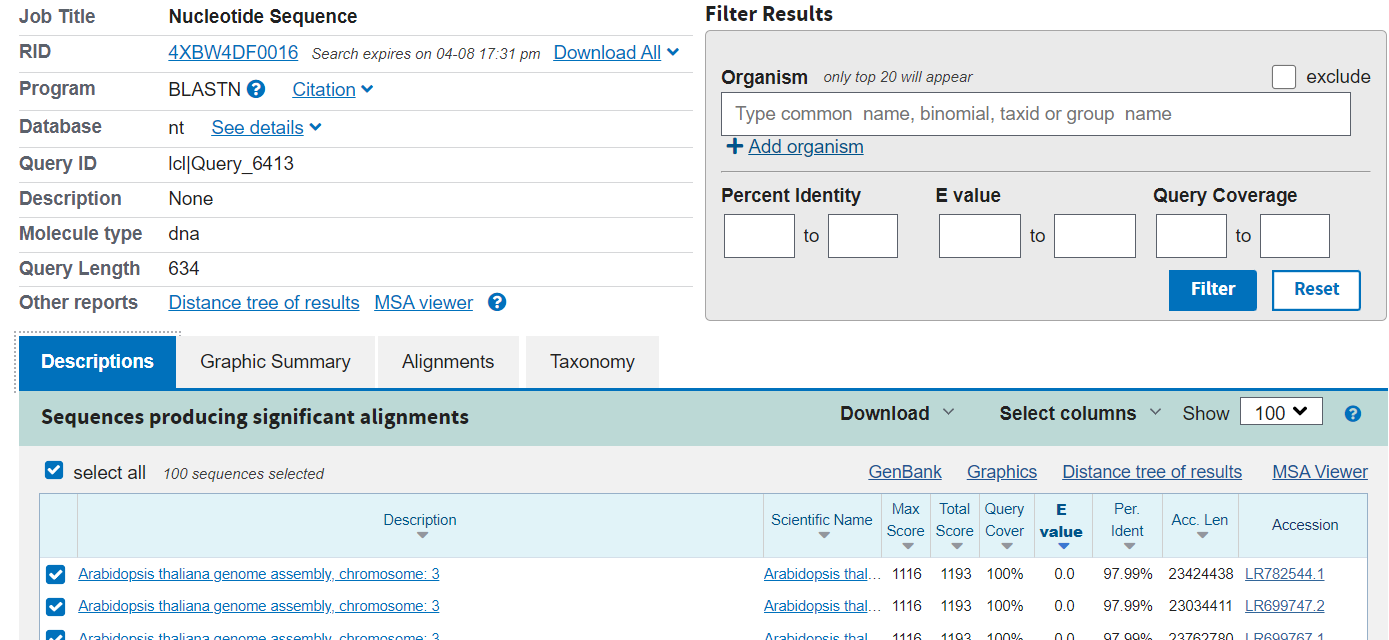
GCAAGATCTGGATCTAGAACTCCGTTTGGGTTTC

• Does the purified sequence encode a protein? How long is the longest open reading frame (ORF)? the longest ORF: 414nt=137aa





• What organism does this sequence likely come from? *A. thaliana*



• Will the purified sequence be cleaved by the following enzymes: EcoRI, KpnI or MseI?

EcoRI 1x

KpnI 0x

MseI 1x

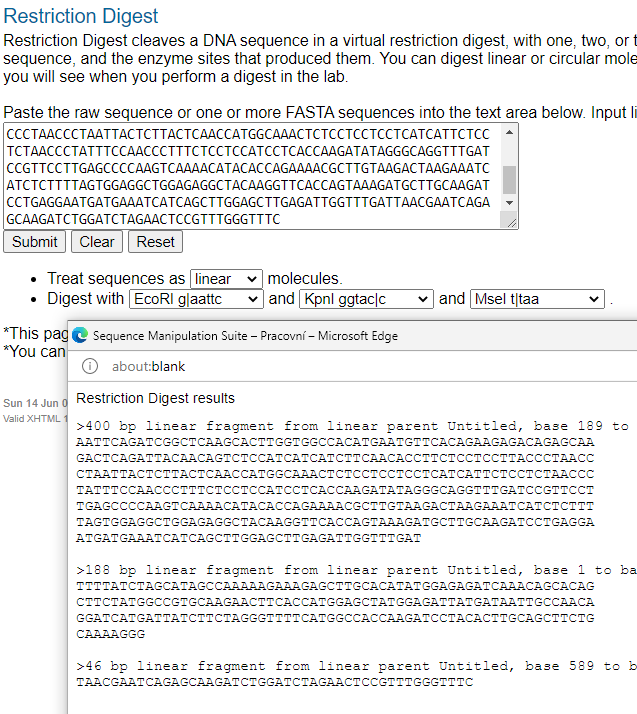






• What fragments are formed after cleavage by all these enzymes at once?

Three fragments: 400bp,188bp,46bp



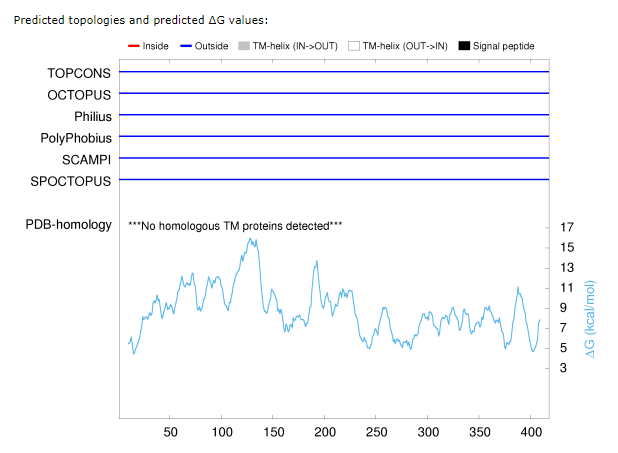
1. **Find a human protein sequence called FOX1**

* What is the accession number and function of this protein?

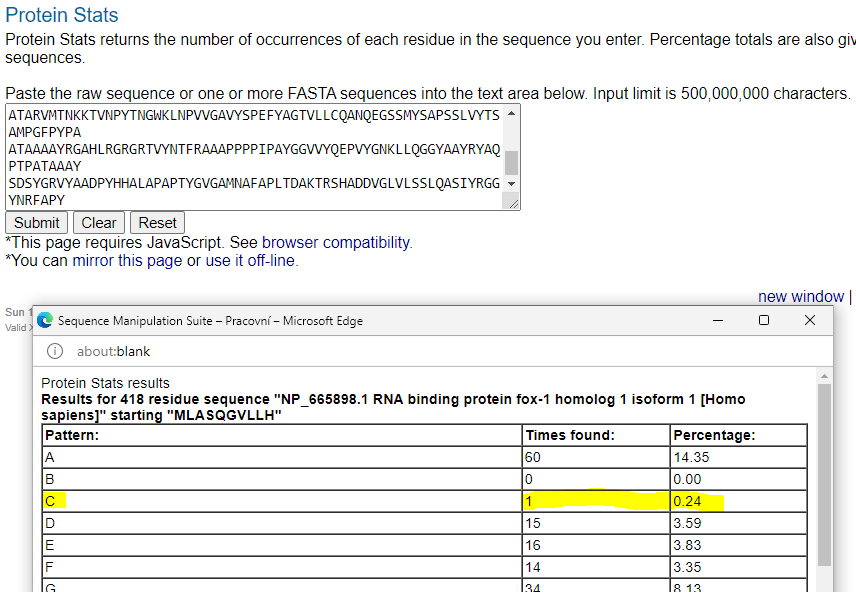
**Q9NWB1 / NP\_665898**

RNA-binding protein that regulates alternative splicing events by binding to 5'-UGCAUGU-3' elements. Regulates alternative splicing of tissue-specific exons and of differentially spliced exons during erythropoiesis.

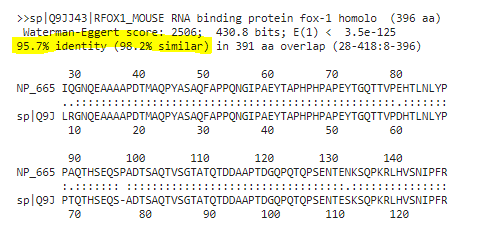
• Does this protein have any transmembrane regions? None



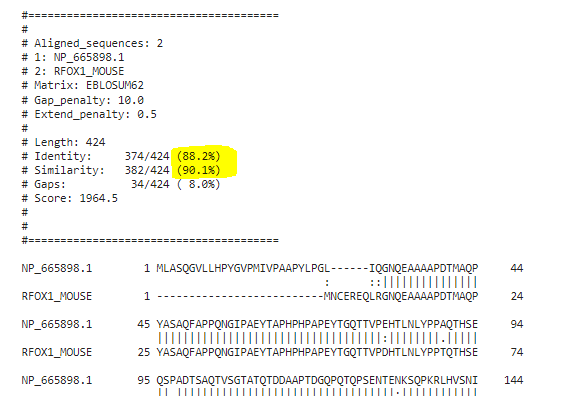
* How many cysteines does the sequence have? 1 cysteine



• Compare how similar the protein is to the respective mouse homologue?

Laling: 

Needle



* Design primers to amplify the CDS of respective gene.

>NM\_145891.3:158-1414 Homo sapiens RNA binding fox-1 homolog 1 (RBFOX1), transcript variant 1, mRNA

ATGCTGGCGTCTCAAGGAGTTCTCCTGCATCCTTATGGCGTGCCTATGATTGTACCGGCAGCTCCTTACC

TTCCTGGACTGATTCAGGGTAATCAGGAAGCAGCCGCTGCCCCTGACACAATGGCTCAGCCTTACGCTTC

GGCCCAGTTTGCTCCCCCGCAGAACGGTATCCCCGCGGAATACACGGCCCCTCATCCCCACCCCGCGCCA

GAGTACACAGGCCAGACCACGGTTCCCGAGCACACATTAAACCTGTACCCTCCCGCCCAGACGCACTCCG

AGCAGAGCCCGGCGGACACGAGCGCTCAGACCGTCTCTGGCACCGCCACACAGACAGATGACGCAGCACC

GACGGATGGCCAGCCCCAGACACAACCTTCTGAAAACACGGAAAACAAGTCTCAGCCCAAGCGGCTGCAT

GTCTCCAATATCCCCTTCAGGTTCCGGGATCCGGACCTCAGACAAATGTTTGGTCAATTTGGTAAAATCT

TAGATGTTGAAATTATTTTTAATGAGCGAGGCTCAAAGGGATTTGGTTTCGTAACTTTCGAAAATAGTGC

CGATGCGGACAGGGCGAGGGAGAAATTACACGGCACCGTGGTAGAGGGCCGTAAAATCGAGGTAAATAAT

GCCACAGCACGTGTAATGACAAATAAAAAGACCGTCAACCCTTATACAAATGGCTGGAAATTGAATCCAG

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ATCTTCCATGTACAGTGCCCCCAGTTCACTTGTATATACTTCTGCAATGCCAGGCTTCCCGTATCCAGCA

GCCACCGCCGCGGCCGCCTACCGAGGGGCGCACCTGCGAGGCCGCGGTCGCACCGTGTACAACACCTTCA

GGGCCGCGGCGCCCCCGCCCCCGATCCCGGCCTACGGCGGAGTAGTGTATCAAGAGCCTGTGTATGGCAA

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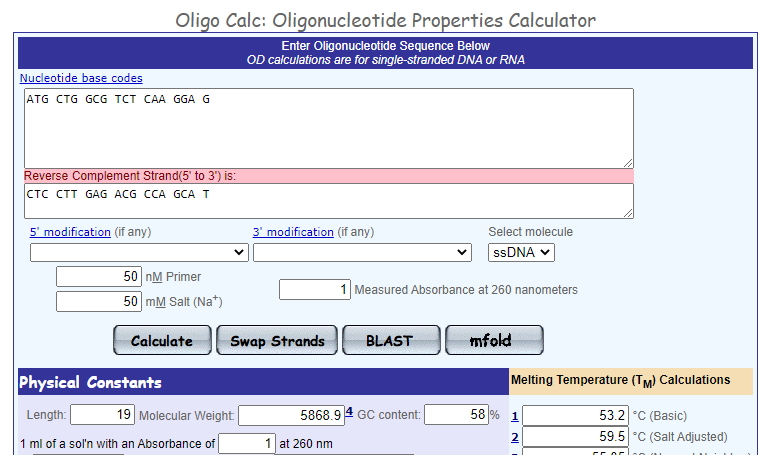
GCGTTGGTGCCATGAATGCTTTTGCACCTTTGACTGATGCCAAGACTAGGAGCCATGCTGATGATGTGGG

TCTCGTTCTTTCTTCATTGCAGGCTAGTATATACCGAGGGGGATACAACCGTTTTGCTCCATACTAA

F: ATGCTGGCGTCTCAAGGAG

R: TTAGTATGGAGCAAAACGGTTG

F:



R:

