

Project 1

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Deadline: December 8, 2022 **before** 6:00 pm

Submit your report as a PDF to the email address mentioned above. You can also use the email address to ask questions.

Assessment

The following points will be assessed:

- Is is the correct approach?
- Were all parameters, tools etc. mentioned?
- Are the results complete and correct?
- Were the results sufficiently and correctly discussed if the task demanded it?
- Does the documentation of the tasks fulfil the guidelines?

Please follow all points mentioned in the project report guidelines that you can find on the lecture website as well as in the Microsoft Team of the lecture.

Sequence

Once you have been assigned to your group, you will find an amino acid sequence with your group number in the Microsoft Team of the lecture, which you should use to solve the following tasks.

Task 1

10 Points

The Protein

Use the sequence to identify your (known) protein. Gather at least the following information about the given protein: gene, organism, cellular compartment, protein family and function.

Task 2

Sequence Motives

15 Points

Determine the conserved regions of your protein and look up the Prints- and Prosite-motifs. Compare the Prints- **and** Prosite-motifs with each other, as well as with the conserved regions of your protein.

Task 3

Transmembrane Regions

15 Points

In addition, identify transmembrane regions with TOPCONS and analyse their conservation. Is the conservation more pronounced in transmembrane helices (THMs) or in loops?

Task 4

Related Proteins

20 Points

Find 3 Proteins each with **similar** in the same and in other organisms. Discuss how your protein is related to these other proteins.

Task 5

Functional Similarity

20 Points

Find 3 to 5 human proteins with **similar** (not the same!) function. Compare your protein to these other proteins regarding motifs, sequence similarity, transmembrane regions and protein family.

Task 6

Protein Family

20 Points

Find 3 to 5 proteins in the same TCDB-subfamily as your protein. Examine and compare these proteins (including your own) regarding their sequence length, sequence similarity, transmembrane regions, motifs and function.

Have fun!