

Lab sheet# 6

Protein databases

-Objectives:

- To be familiar with different protein databases.
- Retrieve protein sequence, related information about the protein and Display 3D structure of a protein.

Use NCBI database and other mentioned websites to answer the following questions:

1. Retrieve the Homo sapiens telomere repeat binding factor 2 (**TRF2**) protein sequence from the NCBI **protein RefSeq database**.
2. Retrieve the **FASTA** format.
3. What is the accession number, the function and how many amino acids does the protein have?
4. What is the name of the **region** located in 87..286 aa?
5. What is the **location** of (telomeric repeat-binding factor 2 Rap1-binding motif)?
6. Display **Uniprot** page of TRF2. What are **alternative names** of the protein? What is the **gene symbol** that codes the protein?
7. Display the **3D structure** of the protein.
8. What are different **biological processes** of TRF2?
9. Name some biological **pathways** TRF2 involved in.
10. What is the **Subcellular localization** of TRF2?
11. In **Pathology section**, open Domain Mapping Of Disease Mutations (DMDM), to see if there are any **mutations or polymorphisms** found in the protein sequence.
12. Are there any **post-translational modification** affects TRF2 function? Name the type of modification and how it affects TRF2.
13. Display all **PTM sites** of TRF2 from PhosphoSitePlus in **PTM Section**. Minimum the number of results by the most frequent modifications. Determine the one with the highest references.
14. Display the **tissue expression atlas** of TRF2 from The Human Protein Atlas (HPA) in **Expression section**. View some pictures showing the localization of TRF2 in the *colon* tissue using immunohistochemistry (IHC) and check the antibodies validations.

- 15.** Display all **protein-protein interactions** of TRF2 from BioGRID in **Interaction Section**.
- 16.** Show other proteins involved with TRF2 in the formation of **Shelterin complex** in Complex Portal in **Interaction Section**.
- 17.** Display **domains and motifs** of TRF2. What is the length of the TRFH dimerization region?
- 18.** How many **isoforms** of TRF2 in **Sequences Section**.