**Lab sheet# 6**

**Protein databases**

**Objectives:**

* To be familiar with different protein databases (Protein and UniProt)
* Retrieve protein sequence, related functional 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 protein **accession number** and how many **amino acids** does it have?
4. What is the **function** of the protein?
5. What is the name of the **region** located in 84..287 aa?
6. What is the **location** of the region (RAP1 binding motif of telomere repeat binding factor)?

**Use UniProt website to answer the following questions:**

1. Display **Uniprot** page of the cellular tumor antigen **P53**. What are **alternative names** of the protein? What is the **gene symbol** that codes the protein and **protein length**?
2. What is the **Function** of P53?
3. What is the **Subcellular localization/s** of P53?
4. Display the **3D structure** of the protein.
5. What is the **quaternary structure** of the protein?
6. Does this protein require any **Co-factors**?
7. What are different **biological processes** of P53?
8. Name some **biological pathways** P53 involved in.
9. What are the different **variants and diseases** associated with P53?
10. Are there any **post-translational modifications** affecting P53 function? Name the type of modification and how it affects P53.
11. Display all **PTM sites** of P53 from PhosphoSitePlus in **PTM Section**. Minimum the number of results by the most frequent modifications. Determine the one with the highest references.
12. How many **isoforms** of P53 in **Sequences Section.**

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**Exercise:**

* Retrieve the Homo sapiens Breast cancer type 1 susceptibility protein isoform 1 (**BRCA1**) sequence? Accession number? Protein length?
* What is the **location** of the region (*RING-HC\_BRCA1*) region?
* Display **UniProt** page of Breast cancer type 1 susceptibility protein (**BRCA1**).
* What is the **Subcellular localization/s** of **BRCA1**?
* Display the **3D structure** of the protein.
* What is the **quaternary structure** of the protein?
* Are there **any diseases** associated with BRCA1?
* Display all **post-translational modification** sites of protein. Determine the one with the highest references.
* How many **isoforms** of the protein.