



LEARN PYTHON & R FOR BIOINFORMATICS

Prerequisite Terminologies:

In order to have a better understanding of the main topic, you should have the basic concept of the following terms:

- **X-ray Crystallography**
- **NMR**

Introduction:

PDB stands for Protein Data Bank is an archived repository of the structures of biomolecules (Proteins, DNA, and RNA). PDB contains the experimentally determined structures of Proteins, RNA/DNA molecules. Using the structural biology techniques, such as x-ray crystallography and NMR, the structures of these biomolecules are determined, hence, PDB stores these experimentally determined structures of Proteins and RNAs which do exist in nature. Once a new structure of a protein or RNA molecule is determined, it has to be deposited on the PDB database in .pdb, .mmCIF and .mtf formats, so that other members of the committee can utilize the files for research purposes.

Steps:

- Click on the following link to visit the homepage of PDB:
<https://www.rcsb.org/>
[The homepage of PDB will open up on your screen.]
- On the top left hand side of the page, it provides the multiple parameters, such as:
 - Welcome- for the homepage of PDB.
 - Deposit- to submit your newly experimentally determined protein/RNA/DNA structure.
 - Search- to search a particular protein molecule from the entire database of PDB.
 - Visualize- to visualize a particular protein/RNA/DNA structure on the PDB.
 - Analyze- to analyze your query molecule, its sequence, structure and other details.
 - Download- to a particular dataset from PDB.
- On the top center of the page, it provides the basic introduction to PDB.
- Then on the top right hand side of the page, it provides the **“Molecule of the month”** structure and hyperlink to provide you with more details about the ‘Molecule of the month’.
- Scroll down to the area where it provides the three columns for **“Latest Entries”**, **“Features & Highlights”** and **“News/Publications”** respectively.
- At the bottom of the page, it provides the statistical calculations about the number of entries stored in the PDB against the **“PDB at Glance”** field.
- To search a query on PDB, enter the query protein name on the search bar present on the top of the homepage of PDB.
[It'll provide a list of entries related to your query protein.]
- Click on a particular accession ID from the resulting list to get the results.

Summary:

In this introductory short video tutorial, we came to know about the Protein Data Bank (PDB), the repository of experimentally determined structures of biomolecules. We also got to know to search for a query protein structure on PDB.