Ligand Searching

Search the RCSB PDB for ligands associated with PDB structures

Look for ligands associated with macromolecular structures at rcsb.org using:

- **Ligand Name and ID Search** from the top-bar Simple Search
- **BIRD molecule** suggestions from the top-bar Simple Search (based on the Biologically Interesting molecule Reference Dictionary)
- The **Chemical Component Search** can be accessed by selecting the top bar ligand icon and clicking on [additional ligand options]. Launch the chemical structure editor to draw a structure or paste in a SMILES or SMARTS string to perform a substructure, exact, similarity, or superstructure search. In addition, ligands can be searched by name, identifier, formula, and molecular weight.
- **Advanced Search** supports the searches mentioned above, plus additional searches by chemical component type, binding affinity, sub-component, BIRD type and class, and more. These types of searches can be combined and even amended with searches for the associated structures.

These searches will return a Ligand Summary page that contains an overview of the chemical component, 2D and 3D images, links to other resources, and links to related ligands and PDB entries.

Screencasts are available online to help explore these features.

Use Ligand Expo to

- Perform component-based searches
- Browse tables of components that contain
  - modified amino acids and nucleotides
  - popular drugs (trade and generic names)
  - common ring systems
- Review related information in chemical dictionaries and resource files (chemical details, geometry, atom nomenclature, and more)
- Download model and ideal coordinates of chemical components
- View all instances of a component in released PDB entries

Representing Small Molecules in the Archive

The wwPDB maintains reference data and descriptions of chemical structures. Updated whenever new depositions introduce novel ligands, the Chemical Component Dictionary exceeds 15,000 unique chemical and structural descriptions for all polymer residues (standard and non-standard) and small molecule ligands found in the PDB. In parallel, a Biologically Interesting molecule Reference Dictionary (BIRD) describes antibiotics, peptide inhibitors, and other complex biological ligands. These dictionaries are updated and distributed with each weekly update of the global PDB archive.

For more information on the how small molecules are represented in the PDB, see wwpdb.org.