MCULE COVALENT LIBRARY

The strength and stability of covalent bonds between a ligand and the target protein can maintain prolonged pharmacological activity. A Mcule Covalent Library contains a wide range of chemical warheads such as Michael acceptors, haloamides or isothiocyanates. A comprehensive set of SMARTS rules describing frequently applied warhead functions were used to filter all purchasable compounds to identify potential covalent ligands.

LIST OF THE SELECTED COVALENT WARHEAD TYPES:

- Epoxide
- Aziridine
- Beta-lactame
- Beta-lactone
- Sulfonyl-ester
- Carbamates
- Vinyl-sulfone
- Vinyl-sulfonamide
- Boronic-acids
- Boronic-esters
- Boranes
- Allenamide
- Propiolonitrile
- Isothiocyanate
- Sulfonimidoyl-fluoride
- Oxaziridine
- Cyanide
- Alkylthiol
- Maleimide
- Ketoamide
- 2-chloro-heterocycles
- 2-ethynyl-heterocycles
- 2-vinyl-heterocycles
- Acrylamide
- Acrylonitrile
- Alkylhalide
- Haloester
- Haloamide
- Haloketone
- Various Michael acceptors

In order to support different kind of drug discovery screening projects, we created the following two subsets:

- **Fragment-sized**: contains molecules that meet the rule of three (Ro3) criteria[1] - good starting points for fragment-based applications
- **Druglike**: contains molecules that fulfill a long list of physicochemical property restrictions (see below) to ensure druglikeness.

CRITERIA LIST OF THE FRAGMENT-SIZED SUBSET

Property	Min	Max
Molar mass	-	300
H-bond acceptors	-	3
H-bond donors	-	3
Rotatable bonds	-	3

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CRITERIA LIST OF THE DRUGLIKE SUBSET

Property	Min	Max
Molar mass	160	450
H-bond acceptors	2	9
H-bond donors	0	2
Rotatable bonds	2	8
Heavy atom count	8	-
LogP	-0.4	3.5
PSA	20	120
Aromatic ring count	-	4
Aliphatic ring count	1	-
Fraction of sp3 carbons	0.2	-
O and N atom count	1	-
Non-organic atom count	-	0
Heteroatom ratio	0.1	1.5
Acidic group count	-	2
Basic group count	-	2
Chiral centers	-	2
Acidic and basic group count	-	3
Non cyclic amide count	-	1
Refractivity	40	130

These property restrictions were collected from various publications assessing druglike physicochemical parameter ranges which ensure favorable absorption, distribution, excretion and permeability of the substances.[2,3,4]

Click **here** to access the downloadable data file of Mcule Covalent Library. This ZIP file contains two folders with separate SMI.GZ files that include the molecules in SMILES format (*SMILES ID*) for each covalent group .

Additionally, our professional laboratory services include:

- Transferring samples to plates/vials as solid or DMSO solution,
- Solubility characterization,
- Temperature controlled shipping,
- Quality control via LC-MS & NMR (on demand).

Please also reach out to our cheminformatics experts with projects related to

- Screening library building/expansion,
- Generation of synthetically feasible chemical spaces based on your building blocks,
- Filtering the Mcule database based on your criteria.

Mcule's Custom Solution Experts are ready to guide you through the selection and ordering process free of charge! If you have any questions or need any help, please feel free to contact us at **support@mcule.com.**

REFERENCES

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