MCULE GPCR TARGETING LIBRARY

THE MCULE GPCR TARGETING LIBRARY COLLECTS COMPOUNDS WITH PROPERTY PROFILES RESEMBLING THOSE OF KNOWN GPCR LIGANDS. THE ANNOTATIONS HELP TO FIND MOLECULES MOST SUITABLE FOR SCREENING AGAINST GPCR SUBFAMILIES.

G protein-coupled receptors (GPCRs) are a broad and diverse set of transmembrane receptors essential in transmitting signals into cells. The significance of the GPCR receptor family is highlighted by the fact that about **one-third of approved drugs act on GPCR targets**.

THE LIBRARY WAS GENERATED VIA THE FOLLOWING PROCESS:

1. **Experimentally validated assay data was collected from the ChEMBL database.** We have collected activity values of small molecular ligands measured on specific GPCR targets. The compounds that showed inactivity were excluded just as those which were only active at concentrations greater than 1 μM.
2. **For each GPCR class, specific physicochemical property ranges were determined based on the assay activity values**. Altogether 16 physicochemical properties were investigated. For each property, the 70% percentile of ligands was used to determine the range limits in order to exclude any outliers and thus keep the final library selective.
3. **The Mcule Database was filtered by 1,000 SMARTS patterns** to exclude compounds containing toxic or promiscuous chemical functions.
4. **The collection was further filtered with the property range limits** based on activity values (point 2) **and the compounds were annotated** with a GPCR group if all of their investigated physicochemical properties lay in the desired ranges.

LIST OF THE INVESTIGATED PHYSICOCHEMICAL PROPERTIES

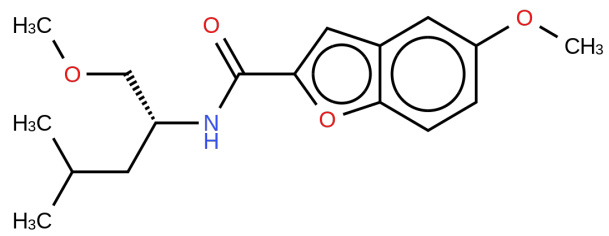
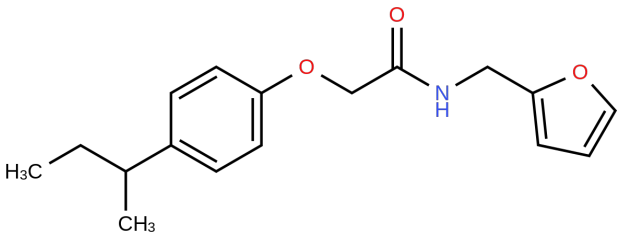
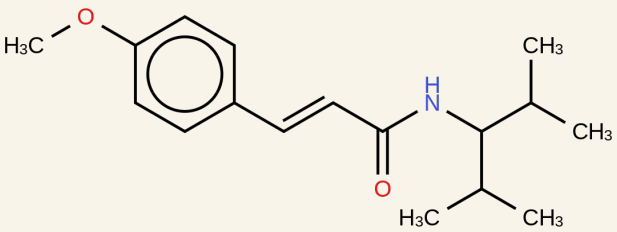
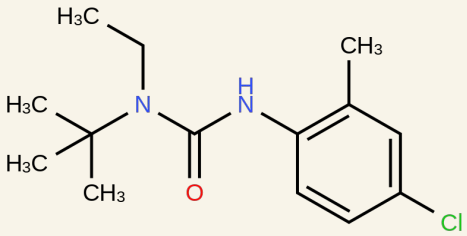
Property specific info

- logP
- PSA
- refractivity
- rotatable bonds
- H bond donors (HBD)
- H bond acceptors (HBA)
- aromatic rings
- aliphatic rings
- acidic group count
- basic group count
- non-cyclic amide count
- fsp3
- mol mass
- halogen atom count
- nso atom count
- heteroatom ratio

Examples for annotated compounds

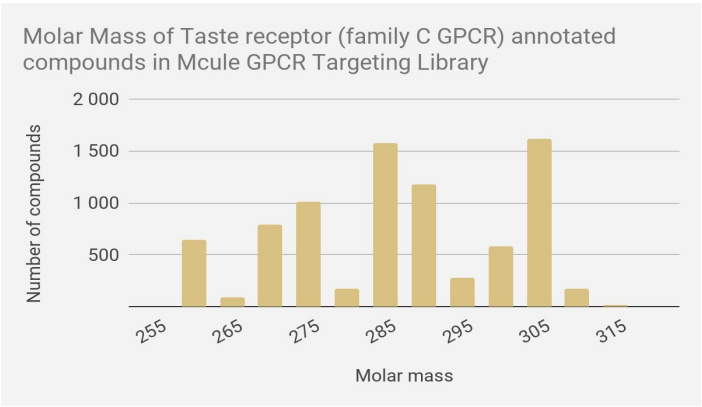
On the left side, reference compounds can be seen that exhibit a high affinity for the Taste receptor (Family C GPCR) according to the ChEMBL activity data.

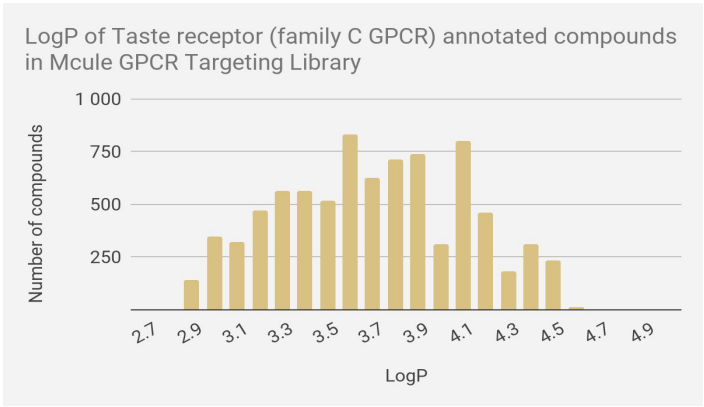
On the right side, annotated compounds with similar physicochemical properties to the reference molecules are illustrated. Consequently, these could potentially serve as candidates for targeting the Taste receptor.

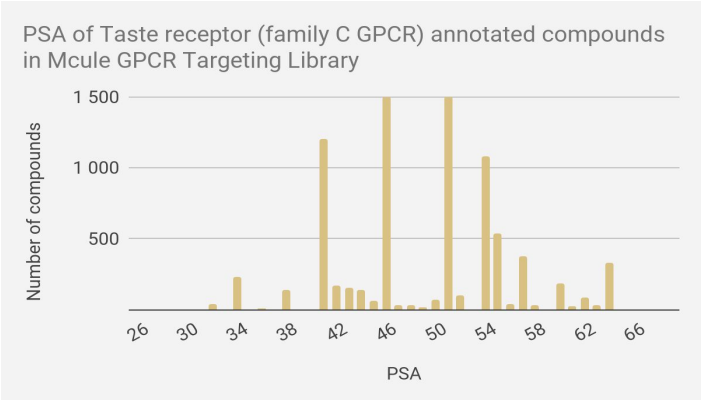
References from ChEMBL	Mcule GPCR Targeting Library members annotated with Taste receptor
	
	

Molar Mass, LogP and PSA distributions of compounds annotated with Taste receptor

As shown by the plots, the presented physicochemical properties of this collection are narrow, thanks to the rigorous filtering protocol that ensures selectivity.







The data files contains the following information:

ID and structure specific info

- Molecule name
- SMILES

Classification specific info

- Protein class levels based on ChEMBL nomenclature (4 ProteinClassification levels)

Property specific info

- logP
- PSA
- refractivity
- rotatable bonds
- H bond donors (HBD)
- H bond acceptors (HBA)
- aromatic rings
- aliphatic rings
- acidic group count
- basic group count
- non-cyclic amide count
- fsp3
- mol mass
- halogen atom count
- nso atom count
- heteroatom ratio

To obtain the Mcule GPCR Targeting Library, download the appropriate data file (format: CSV.GZ) from **here**. Here you can find the corresponding documentation for detailed information about the file contents and suggested usage, complete with examples as well.

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.**