

Screening Compound Libraries

- HTS Compound Collection
- Targeted and Focused Libraries
- Diversity and Pre-plated Screening Sets
- Fragment Libraries for FBDD
- Custom Compound Libraries Design
- Tangible Screening Compounds

MedChem CRO Services

- Custom Synthesis
- Off-the-shelf Building Blocks
- Fine Organic Chemicals
- Scaffold Hopping
- Route Scouting, Scale-up
- Process Optimization

Computational Chemistry Services

- Physicochemical Properties Calculations
- ADMET Prediction, QSAR, Diversity
- Computer-Aided Molecular Design: Virtual Screening, Machine Learning
- Molecular Dynamics Simulation
- Structural Bioinformatics

In Vitro ADMET Tests

- Solubility, LogP, LogD
- Permeability Evaluation (Caco-2, MDCK)
- Plasma Protein Binding
- Volume of Distribution
- Brain and Lung Tissue Binding
- Proteinase, Thrombin Inhibition Assays

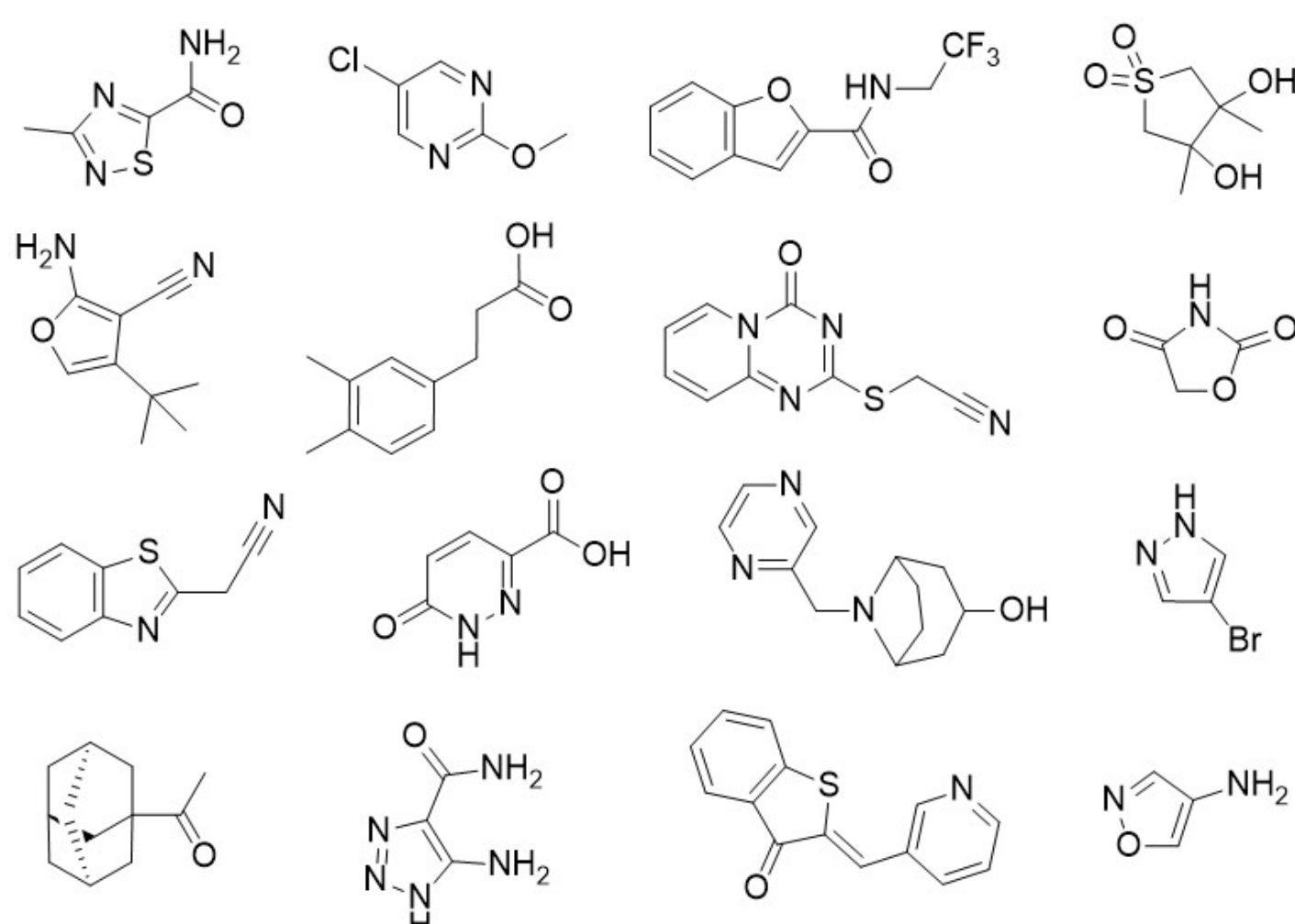
Life Chemicals has designed its proprietary Fragment Collection of nearly **55,000** small-molecule compounds available in stock, including a selection of unique fragment subsets:

General Fragment Library

- 55,000** stock fragments
- MW \leq 300 and ClogP \leq 3.0
- Created for fragment-based drug discovery
- Reactive, unstable molecules filtered out

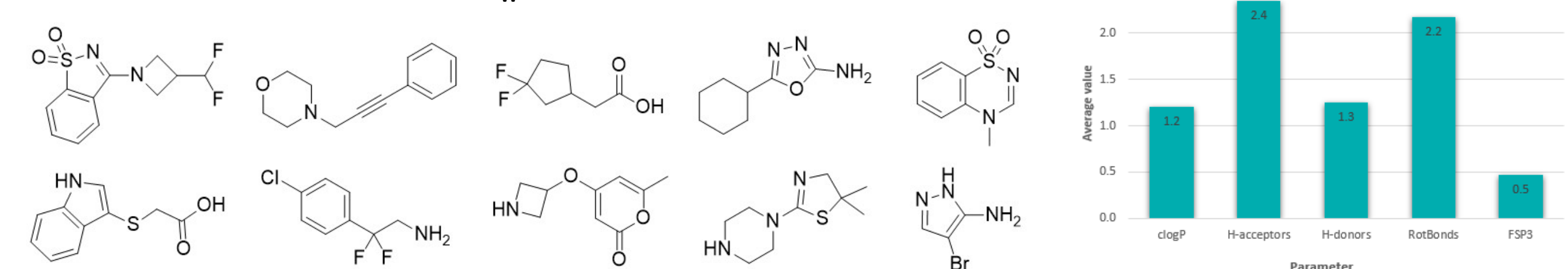
Diversity Screening Sets

- 1,600** and **3,200** non-overlapping structurally-diverse drug-like fragments
- Convenient starting kits for fragment-based lead generation



Ultimate Fragment Library

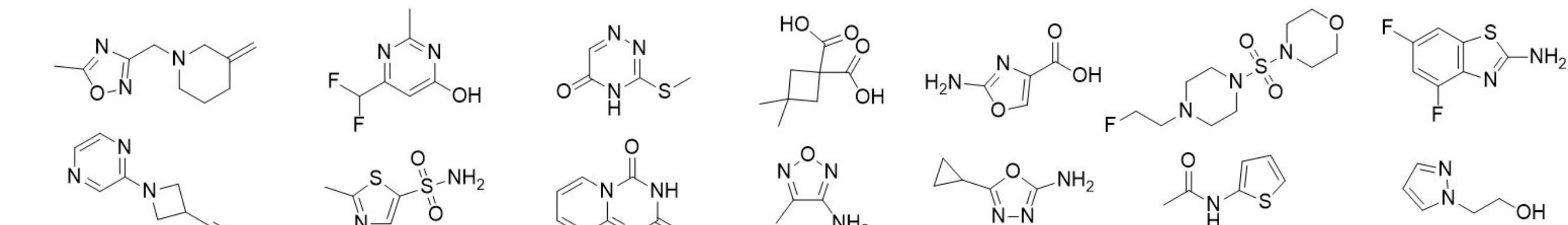
10,300 drug-like fragments were selected by applying the ultimately refined fragment picking approach: Ro3, log_{S_w} \geq -3, TPSA \leq 80 Å² cuts-off.



Fragment Library Experimental Solubility

Solubility of fragments is the crucial feature that limits their use in various screening techniques. Life Chemicals developed its in-house high-throughput technique of kinetic and thermodynamic determination of aqueous solubility to select **22,500** fragment-like molecules with confirmed aqueous solubility.

7,000 fragments are soluble at high concentrations with minimum experimentally confirmed solubility in PBS at 1 mM and in DMSO at 200mM, measured with HPLC.



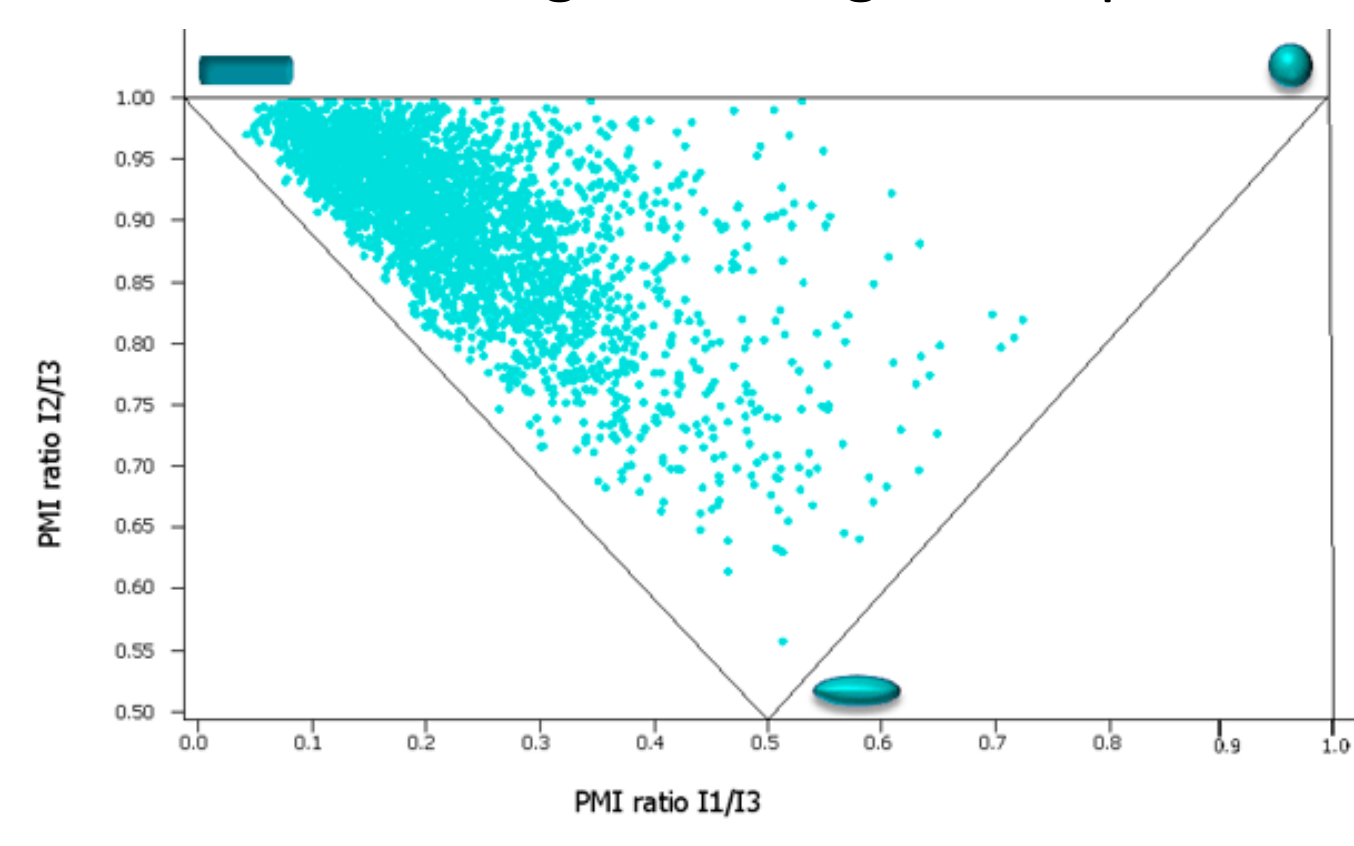
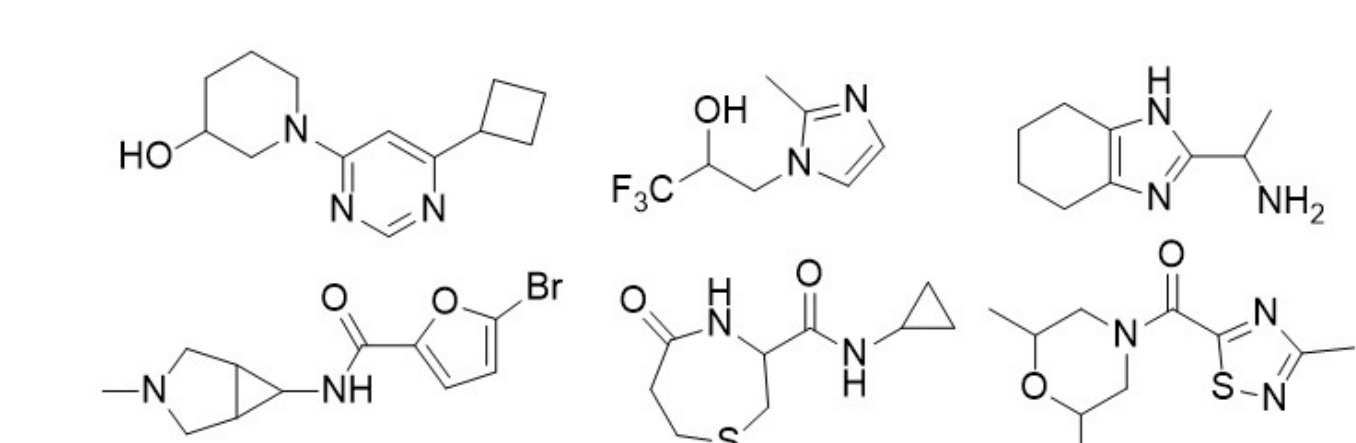
Fragment Diversity Subsets

Screening pools of **960** and **320** drug-like fragments, totally amounting to **1,280**, with optimal molecular complexity, diversity > 47 % and experimentally assured solubility at 200 mM in DMSO are offered as solids or pre-plated sets to become an optimal starting point for hit identification projects.

3D-shaped Fragment Library

A higher three-dimensionality of molecules is a desirable feature of drug candidates, to correlate with the successful passage of molecules at various stages of drug development.

3,100 fragments, representing a variety of 3D shapes (rod-like, disk-like, and spherical) with sufficient diversity, were selected using physicochemical properties and descriptors.



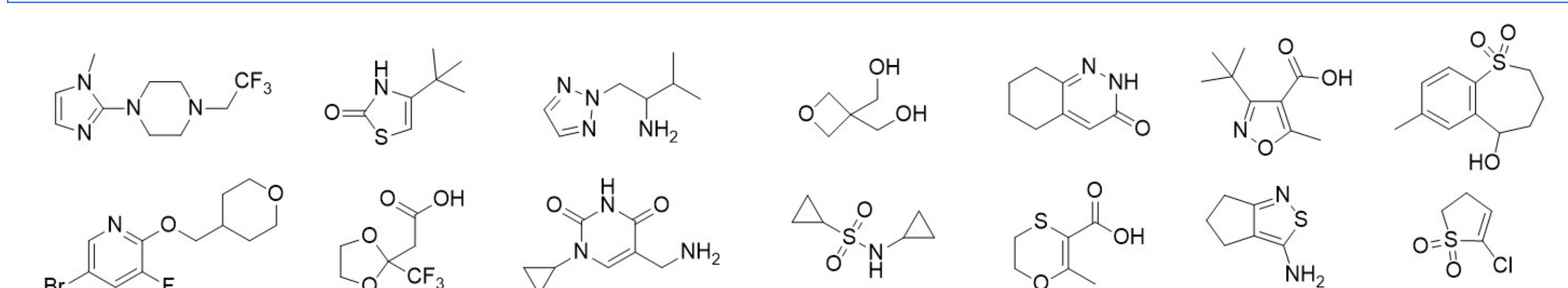
Fsp³-enriched Fragment Library

The mean saturation degree Fsp³ was shown to increase from 0.36 in 2.2 million molecules at the development stage to 0.47 in 1,179 of approved drugs.

Application of the Fsp³ cut-off at 0.45 resulted in **19,900** original sp³-rich fragments.

A **Diversity Screening Set** of **1,600** structurally-diverse sp³ fragments was also prepared.

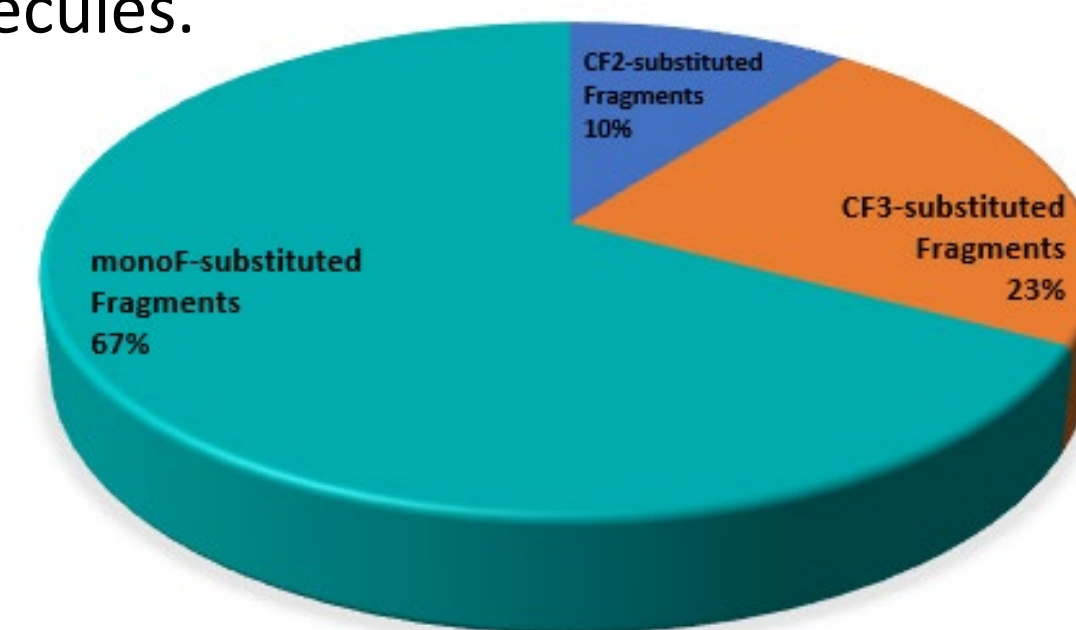
Parameter	MW	ClogP	Fsp ³	TPSA	RotB	HBD	HBA	Benzene rings
Selection range	\leq 300	$<$ 3	\geq 0.45	$<$ 90 Å ²	\leq 3	\leq 3	\leq 3	\leq 1
Average value	247.5	1.1	0.6	59.2	3.4	1.4	2.9	\leq 1



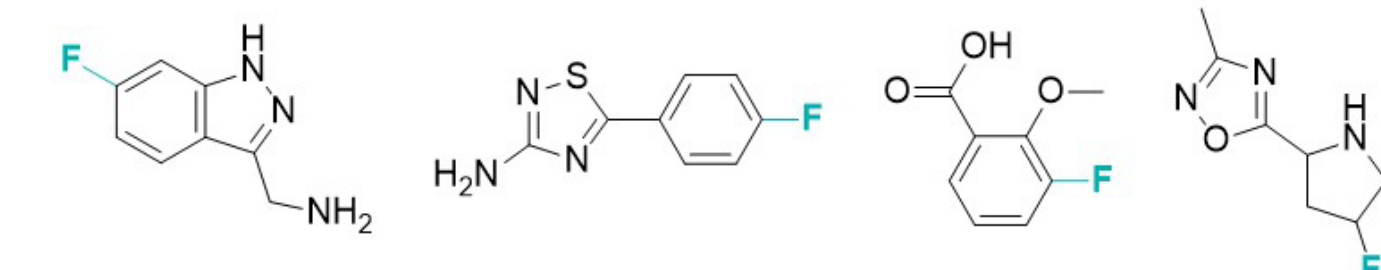
Fluorine Fragment Library

¹⁹F NMR ligand-based fragment screening is used as a very efficient tool for rapid and sensitive detection of fragment hits.

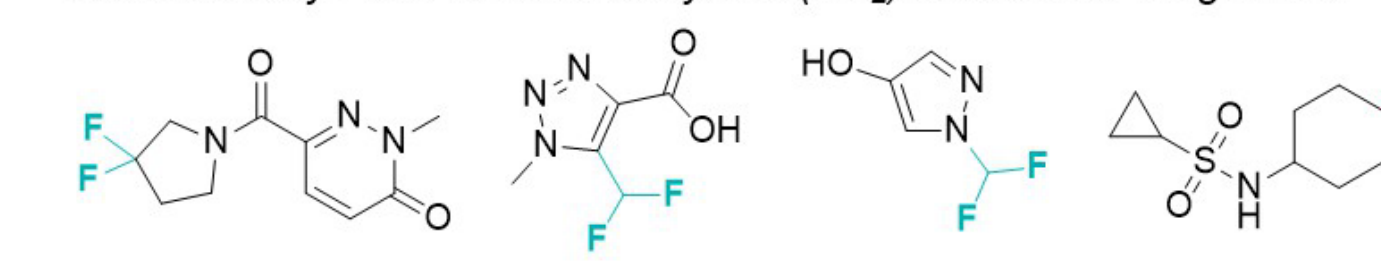
6,800 fluorine-containing fragments are offered, including a **Diversity Screening Set** of **1,600** fluorinated fragment-like molecules.



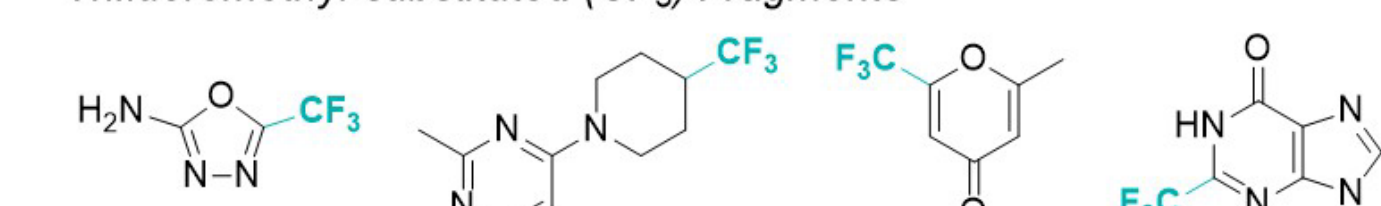
Single-fluorine Fragments



Diffluoromethyl- and difluoromethylene (CF₂) substituted Fragments

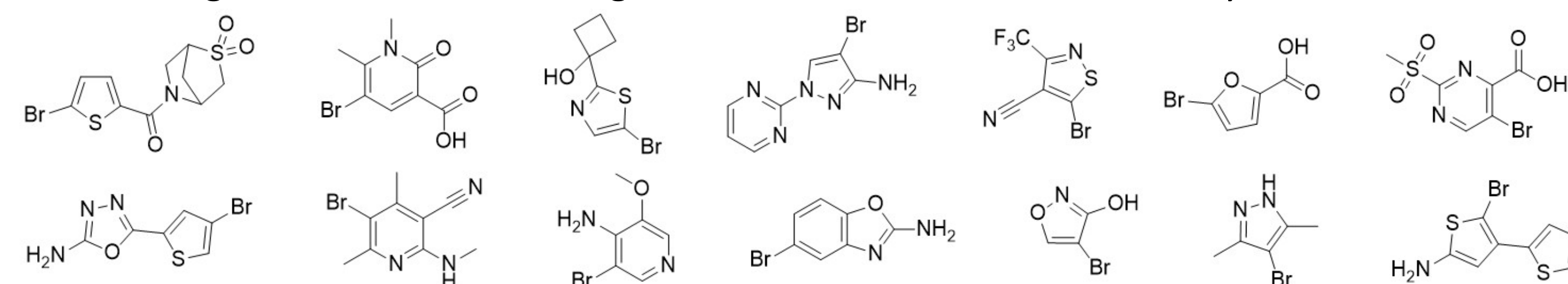


Trifluoromethyl-substituted (CF₃) Fragments



Bromine Fragment Library

2,300 bromine-substituted fragments containing only one Br-atom can be applied in X-ray crystallographic fragment screening. A **Diversity Screening Set** of **960** bromine-labeled fragments with a wide range of chemical structure dissimilarity is available.

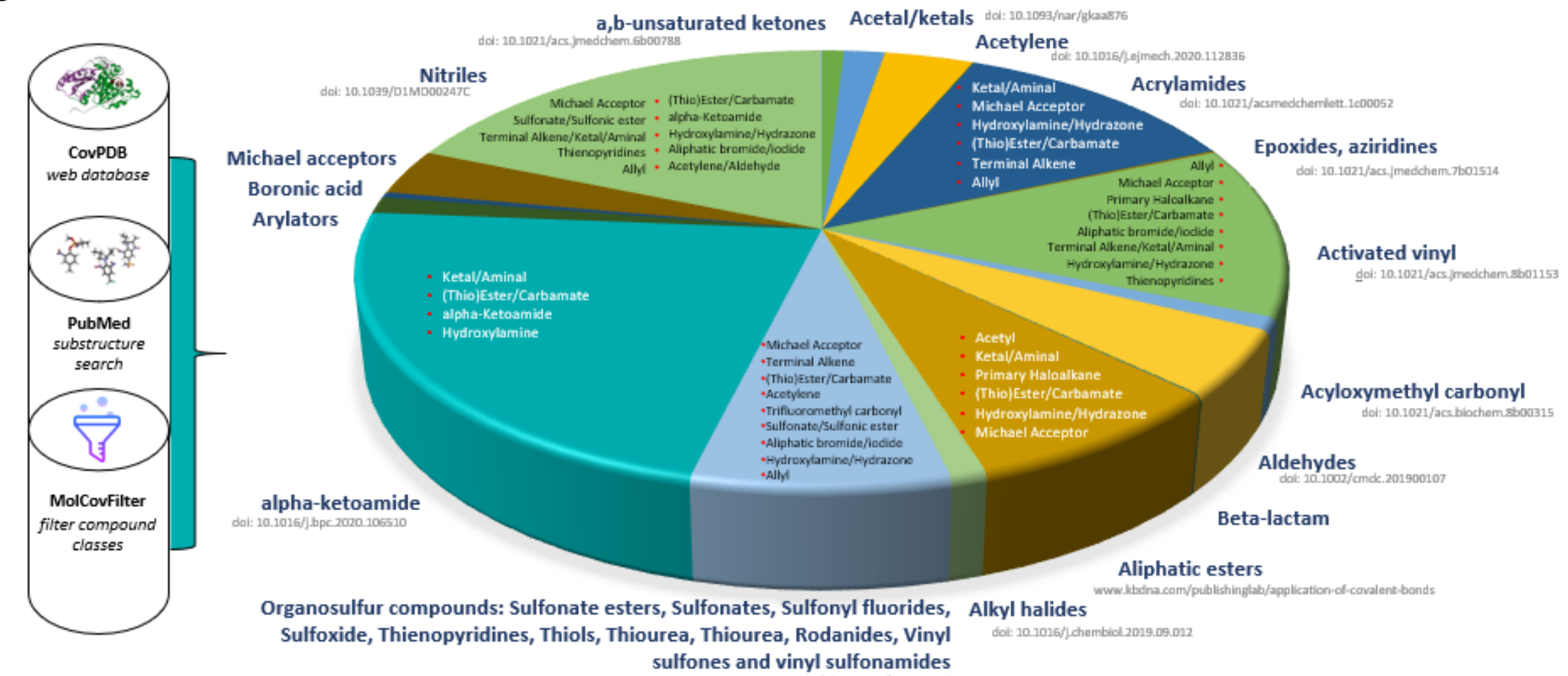


Covalent Fragment Library

6,200 covalent inhibitor fragments containing specific warheads can form covalent bonds with amino acid residues (Lys, Cys, Ser, His, Tyr) in binding sites of targeted proteins.

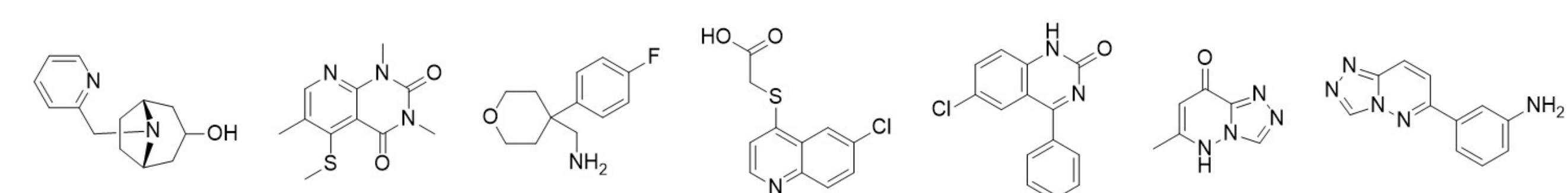
A **Diversity Set** of **960** covalent modifiers with high diversity by warheads was created.

The following chemical classes and structural moieties were used for arraying potential fragment-like covalent binders:



Natural Product-like Fragment Library

3,800 synthetic fragments similar to natural compounds were selected via the Scaffold Tree approach as promising starting points within an attractive chemical space.



Low MW Fragment Library

Recent tendencies in drug discovery shift towards leads with lower molecular weight and higher hydrophilicity. **7,200** small-molecule screening compounds that are low-molecular-mass fragments are presented.

Parameter	MW	ClogP	TPSA	RotB	HBD	HBA	Ring count
Selection range	100 - 225	-6	0 - 100 Å ²	\leq 3	\leq 3	\leq 3	1 - 3
Average value	179.5	0.9	52.1	1.4	1.3	2.4	1.7

PPI Fragment Library

PPI inhibitors are typically larger and more lipophilic than inhibitors of more standard binding sites of most proteins. Meanwhile, FBDD turned out to be a more efficient approach for the design of novel PPIs modulators in comparison with HTS as the PPI interface often consists of discontinuous hot-spots.

Specially designed **7,100** fragments with hydrophobic and more spatial structures (sp³-enriched), higher MW and TPSA values are offered.

