How should we decide what to screen?

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- Possible small organic molecules estimated > 10^{60}

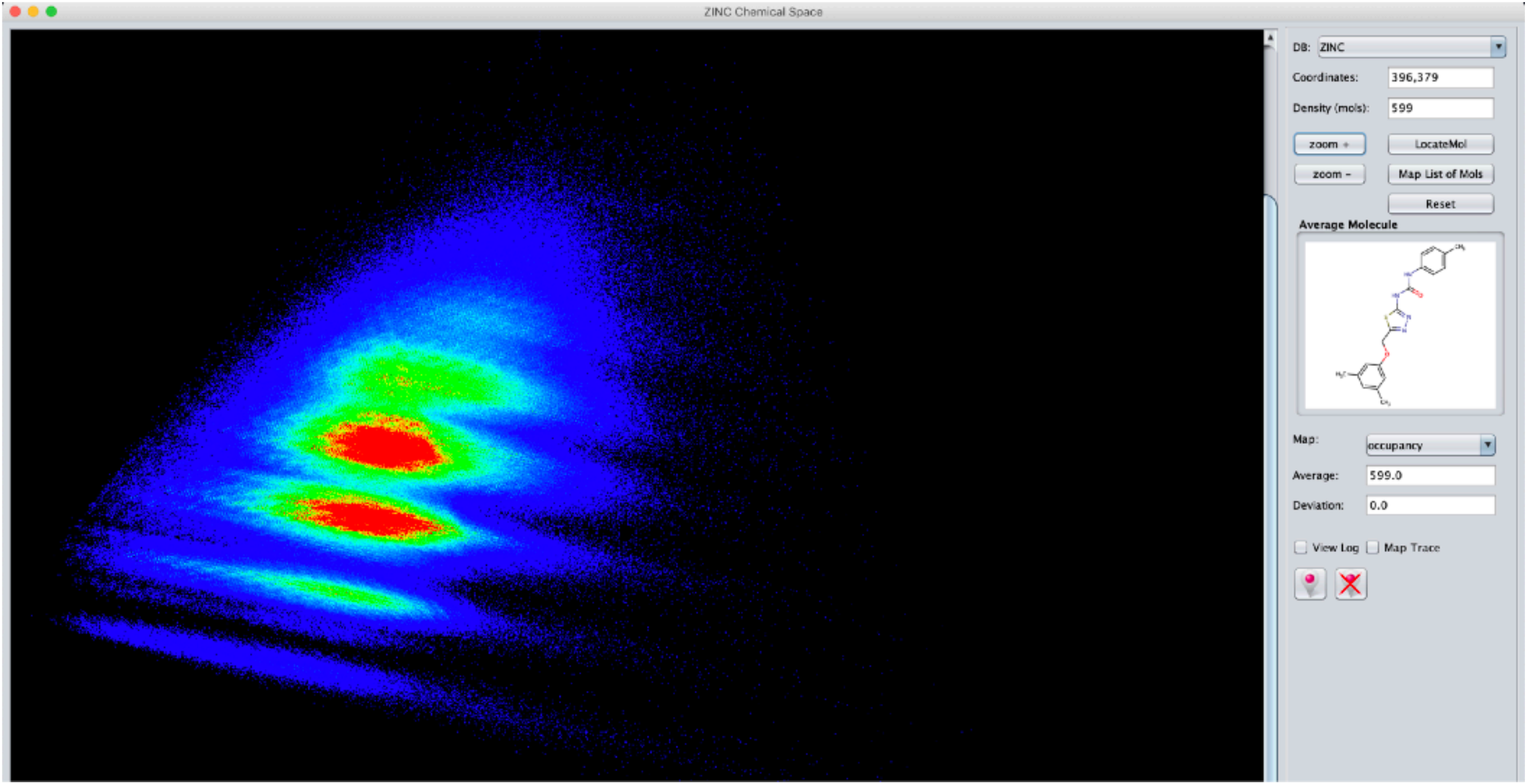
- Generated and collected in a database (GDB)

- GDB-11: 26.4 compounds with up to 11 atoms of C, N, O, and F

- GDB-13: ~1 billion compounds with up to 13 atoms of C, N, O, S, and Cl

- Exhaustive search not necessarily feasible or useful

- Different types of chemical libraries may be suitable



Generated by MQN-Mapplet (http://gdb.unibe.ch/tools/)
[Awale et al, 2013]

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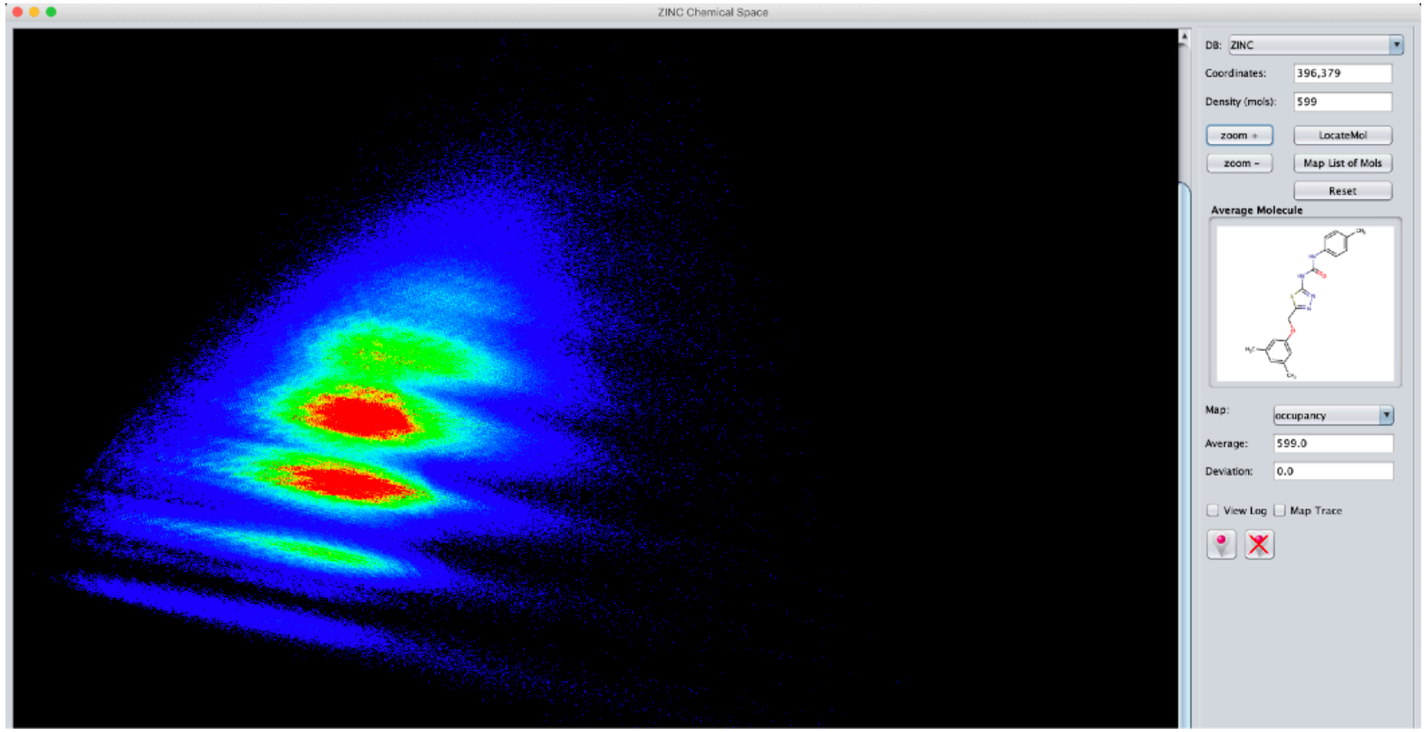

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What types of chemical libraries are used?

Type of library	Analogy	Examples
Comprehensive	Search in the dark	ZINC15:~1 billion compounds in vendor catalogs. ~11 million in stock.
Combinatorial	Search in the dark	Enamine REAL:13 billion “readily accessible” molecules.
Diverse	Efficient search in the dark	Diverse REAL drug-like:15 million. NCI Diversity Set VI:1548 free.
“Focused” or “Targeted” for lead identification	Search with a flashlight	Filtered for a structural motif or pharmacophore
“Focused” or “Targeted” for lead optimization	Focusing the spotlights	Riboflavin analogues

Analogies from Morris et al, 2008