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# BIOS: Similarity-based design of natural product derived compound collections

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Computational approaches are frequently used in ligand design. We have developed two complementary techniques, the Protein Structure Similarity Clustering (PSSC) [1] and the Scaffold Tree [2,3].

The PSSC is based on subfold similarity around the binding sites of proteins. Its central hypothesis is that structurally similar binding sites bind structurally similar ligands. Thus PSSC leads to target clusters and structural templates for library design.

The Scaffold Tree provides a structure based classifiction of chemical compounds based on their scaffolds. These scaffolds are then further deconstructed according to a set of rules yielding a hierarchy of chemically meaningful entities. This genealogy based on substructure relationships can be used to chart chemical spaces and to mine large datasets, e.g., of screening data.

The concept of "Biology Oriented Synthesis" (BIOS) describes the synthesis of new biologically active compounds starting from prevalidated structures and also incorporates the joint application of PSSC and the Scaffold Tree. It offers new routes to biologically prevalidated compounds and corresponding target cluster promising more and selective hits.

## References

1. Koch MA, Wittenberg LO, Basu S, Jeyaraj DA, Gourzoulidou E, Reinecke K, Odermatt A, Waldmann H: *PNAS* 2004, **101:**16721-16726.
2. Koch MA, Schuffenhauer A, Scheck M, Wetzel S, Casaulta M, Odermatt A, Ertl P, Waldmann H: **Charting biologically relevant chemical space: A structural classification of natural products (SCONP).** *PNAS* 2005, **102:**17272-17277.
3. Schuffenhauer A, Ertl P, Roggo S, Wetzel S, Koch MA, Waldmann H: **The Scaffold Tree - Visualization of the Scaffold Universe by Hierarchical Scaffold Classification.** *J Chem. Inf Model* 2007, **47:**47.
4. Noeren-Mueller A, Reis-Correa I, Prinz H, Rosenbaum C, Saxena K, Schwalbe HJ, Vestweber D, Cagna G, Schunk S, Schwarz O, Schiewe H, Waldmann H: *Proc Natl Acad Sci USA* 2006, **103:**10606-611.