DNA-encoded (DEL) Reagents and Building Blocks

DNA-encoded chemical libraries (DEL) are an emerging drug discovery screening technique. DELs allow simultaneous probing of target binding by millions and billions of small-molecule compounds [1–3], covering the broadest chemical space in a short time and at low cost, utilizing the power of next-generation sequencing (which, in particular, has a lower price per compound tested as compared to high-throughput screening HTS).

DEL technology is foreseen to improve hit identification in drug discovery significantly. Moreover, the use of DEL screening has vastly extended and diversified the chemical space that can be explored in a single experiment [2]. Using DELs has been very successful across a broad spectrum of drug targets in both pharma/biotech and academic laboratories [4].

A large number of scaffolds and building blocks are required to conduct a synthesis of DELs. A DNA tag is then tethered to each library compound by choosing an encoding method (Fig. 1). Many types of DEL encoding methods have been developed, and most of them are based on a widely applicable 'split-mix-split' strategy in combinatorial chemistry.

Life Chemicals offers over **70,000** structurally diverse small-molecule compounds, including mono-functional "decorators" as well as protected bi-functional and tri-functional "core" building blocks, scaffolds, and fragment compounds. The presented compound collection is aimed at the construction of various DELs, both broad-spectrum or target-focused.

The distribution of the most important physicochemical parameters of the Library compounds is depicted in Fig. 2. The functional groups used for the Library design:

- carboxylic
- aryl halide
- isothiocyanate
- aldehyde
- sulfonyl chloride
- ester
- azide
- nitro
- terminal alkyne
- amine
- N-Fmoc
- N-benzyl

A custom selection of compounds by any parameter can be performed on requests. Cherry-picking is also available.

Please, contact us at orders@lifechemicals.com for any details and quotations.

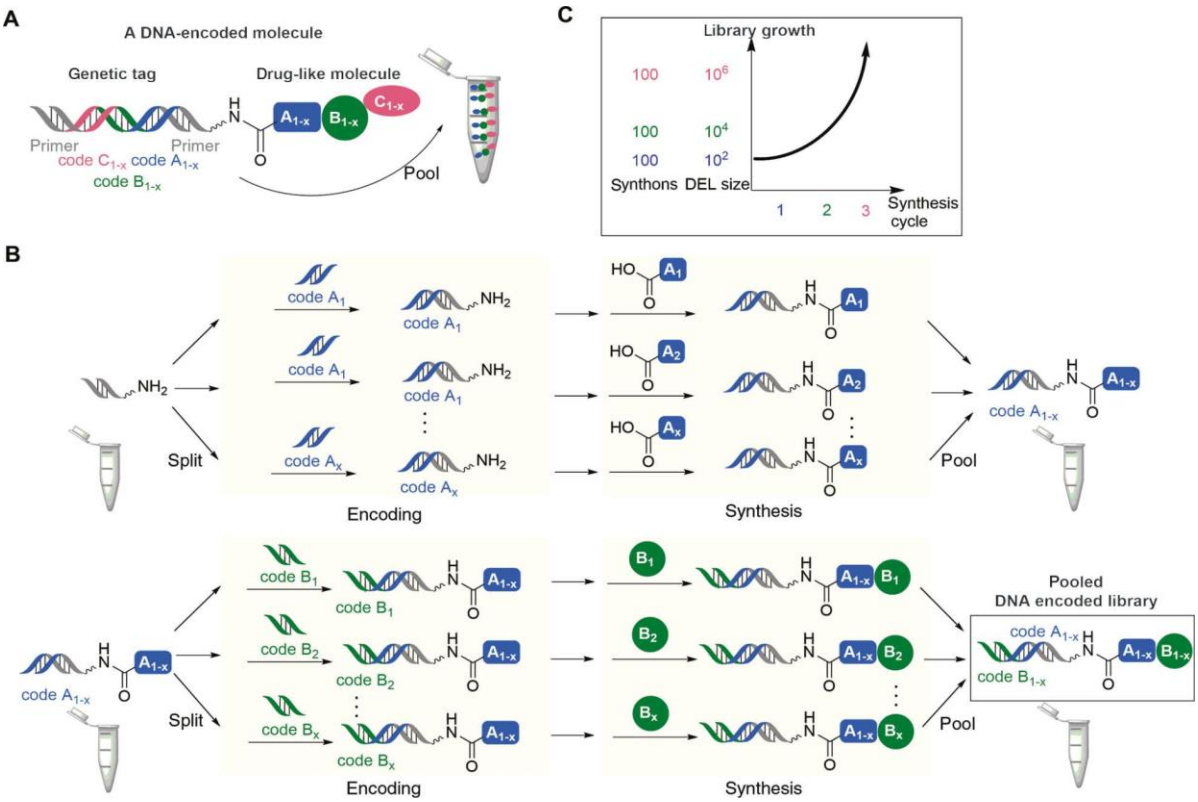

Fig. 1. Encoded compound library synthesis. (A) Structure of a DNA-tagged drug-like small molecule, collections of DNA-tagged compounds are pooled to vast mixtures; wavy bond: linker, usually a short polyethylene glycol. (B) Synthesis of DNA-encoded libraries through iterative, combinatorial cycles of alternated DNA-tagging, and organic preparative synthesis steps ('split-and-pool synthesis'). (C) The combinatorial workflow leads to an exponential growth of DELs. Citation: Biological Chemistry 399, 7; 10.1515/hsz-2018-0119

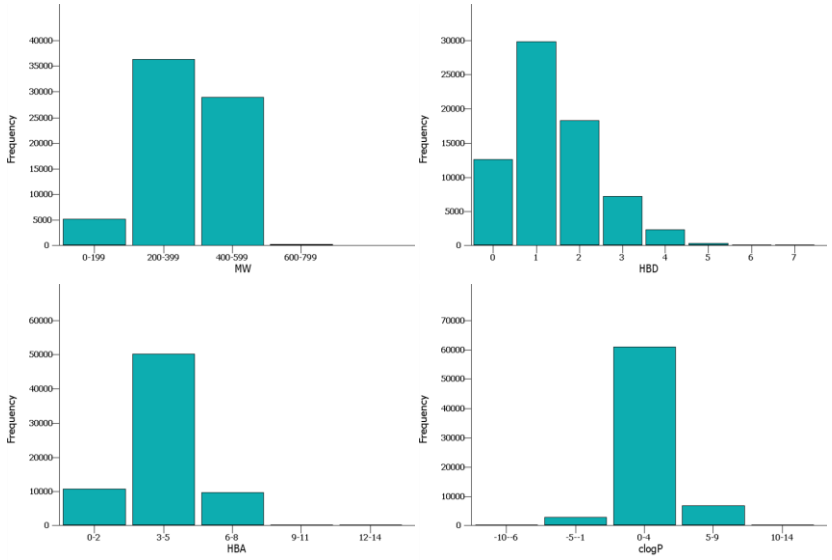

Fig. 2. Distribution of molecular weight, hydrogen bond donors, hydrogen bond acceptors within the library of DNA-encoded Reagents and Building Blocks.

References

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