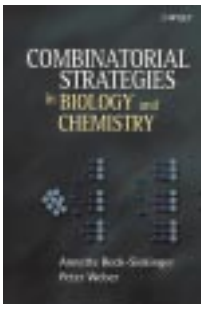

Combinatorial Strategies in Biology and Chemistry

Annette Beck-Sickinger and Peter Weber, John Wiley & Sons, New York, 2002; xiii + 179 pages, US$35.00, ISBN 0-471-49727-4

Combinatorial chemistry developed in the mid 1980s, starting with huge libraries of peptide mixtures. Several years later, the first libraries of small organic molecules were prepared, most often as poorly defined mixtures. Molecular weights were too large, all molecules were too lipophilic and, in general, they were neither drug-like nor lead-like. Correspondingly, the contribution of combinatorial chemistry to lead discovery in pharmaceutical research, its main application, was relatively poor. Only in the past ten years have the strategies shifted towards parallel automated syntheses of arrays of single compounds with defined purity, contained in much smaller libraries. In addition, the compounds of such libraries now have a more pronounced lead- or drug-like character. In the meantime, many examples of interesting hits from these libraries have been published.

However, many organic chemists are still not aware of the enormous potential of parallel synthesis. The book *Combinatorial Strategies in Biology and Chemistry* is ideally suited to changing this situation. After a short introduction, in which combinatorial principles in nature are illustrated, the next chapter, *Peptide Libraries - How It All Began ...*, describes the first developments in this new field, as well as polymeric supports for solid-phase syntheses, linkers and linker strategies, and various synthetic strategies, including split-and-mix syntheses. The following, relatively short chapter is dedicated to the synthesis of non-peptide libraries, followed by a more detailed chapter on the synthesis of chemical libraries, based on the use of mixtures. Encoding, decoding and deconvolution strategies are described in detail. A chapter on parallel synthesis and automation focuses mainly on the equipment of some German companies. *Combinatorial Methods with Molecular Biological Techniques*, the following chapter, describes phage display techniques and combinatorial mutagenesis, as well as directed evolution of proteins and RNA. The last chapter is dedicated to the analysis of libraries and arrays, by various chromatographic techniques, NMR and MS. Overall, it is surprising how much information has been packed into this 180 page book. Only solid phase-supported reagents are missing – a technology that will also change the strategies of classical organic synthesis, as exemplified by the work of Stephen Ley and his group at the University of Cambridge (http://www.cam.ac.uk/).

Combinatorial Strategies in Biology and Chemistry is translated from the successful German edition, published in 1999 by Spektrum Akademischer Verlag. This version, however, has been updated and contains many references up to late 2000. Its limitation to German equipment is the only drawback to this otherwise excellent and highly comprehensive introduction into combinatorial chemistry and parallel synthesis and there is a highly useful list of abbreviations and a glossary.

Naturally, it can not be expected that many different synthesis procedures be included in such a short book, but a large number of illustrative schemes, drawings and other figures provide a condensed information that makes this book a top choice for beginners. The density of information, its excellent readability and broad selection of topics make this a highly recommended book for undergraduate and graduate students, technicians and all scientists who want to get a quick introduction into this field. The specialist reader, however, will have to look for a (much more expensive) alternative.

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