

Combinatorial Chemistry and Technologies: Methods and Applications, Second Edition, G. Fassina, S. Miertus (Eds.), CRC Press: Boca Raton, USA, **2005**, hardcover, 597 pp, \$169.95, ISBN 0-8247-5837-4

Recent developments of new technologies in combinatorial science have provided prodigious shortcuts in the speedy generation of new chemical entities, thereby shortening the process of drug discovery and generation of agrochemicals.

In collaboration with a team of scientists from industry and academia, Dr. Giorgio Fassina and Professor Stanislav Miertus have assembled a guidebook, *Combinatorial Chemistry and Technologies*, which contains twenty-four chapters covering appropriate topics on the subject. The collected information on technologies is divided into processes of generating combinatorial libraries, support for analytical methodologies, and easy transition from established synthetic chemistry to slightly more complex biological aspects of combinatorial science at the molecular level.

In this second print of the book, a few chapters from the previous edition are amended to accommodate the latest developments, and some are newly written. The portion of the book that deals with recent developments in the field of biological libraries, biopanning, and application of aptamers in basic science, as well as that which covers combinatorial approach in gene expression, cover these newly developed areas for combinatorial scientists.

The authors have been quite successful in their efforts to provide a guide to scientists involved in the field of drug discovery with little-or-no knowledge of combinatorial chemistry. In a few instances, attempts have been made to promote subjectively an author's own work and some of the citations are not so recent. However, this overall instruction guide is a valuable companion to scientists involved in combinatorial work.

Chapters one through ten of the book (Part 1) encompass advanced methodologies used in combinatorial chemistry and technologies, including extensive details related to the

principles, applications, other preparative features, use of linkers, the types of synthesis, resins, solid and solution phase, computer-design for organic libraries, deconvolution and encoding techniques of small organic molecules. Discussion of several topics has been updated to include more recent developments. A few chapters in Part 2 discuss some selected methods for characterizing combinatorial libraries. The methods used are similar to those used in the analytical laboratories.

In the next chapters (Part 3), biological aspects of combinatorial chemistry are described in sufficient detail, with some novel technologies such as oligonucleotide aptamers and DNA and RNA microarrays. The authors have provided adequate guidance for using computational methods for designing and generating combinatorial libraries. A common methodology developed for combinatorial chemistry work has been applied to the generation of biological libraries, and is a good procedure for chemists leaning towards exploring biochemical libraries. The utility of combinatorial methodologies in the advanced biological areas includes proteomics and gene expression, among others. The last chapter furnishes economic details of the combinatorial approach to discovering new chemical and biological entities. Some of the cited figures are interesting, such as that giving the cost of bringing a new drug to market – it is easily three times higher than the cost cited in the book. The authors have succeeded in their endeavor by appraising several production methods, and comparing the costs for generating an entity through various research and development techniques.

In summary, the book offers a reference guide to scientists with a limited knowledge in the field of combinatorial chemistry. Several of the combinatorial techniques could be new to scientists who are exposed to biology-mixed chemical transformations. The overall coverage on the subject keeps the mind occupied in learning new combinatorial techniques.

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