Book Reviews

Solid-Phase Synthesis and Combinatorial Technologies. By Pierfausto Seneci. Wiley-Interscience, New York. 2000. xii + 637 pp. 16 × 24 cm. ISBN 0471331953. $109.95.

This comprehensive book ambitiously targets a broad audience of chemists: the gamut from advanced graduate students and transitioning classical organic chemists to experienced combinatorial synthesis bench researchers. By design, the overall format favors its use as the basis for a graduate course. The first five chapters are introductory, given to an overview of solid-phase synthesis and the practical considerations for its application to combinatorial technologies. The remaining six chapters bring these fundamentals to bear on hot and emerging topics in the discipline. These latter chapters are organized by libraries generated through solid-phase, solution-phase, biosynthetic, and materials/polymeric chemistries. Herein, drug-like properties of DNA or RNA ligands (aptamers), biocatalysts (ribozymes), and artificial receptors provide impetus for the adoption of these approaches. In-depth discussion of numerous representative applications allows for a thorough appreciation of both the efficiencies and the limitations that combinatorial chemistry offers to structure−activity studies. Ample and clear reaction schemes, complete with concise legends, nicely complement the narrative.

The chapters are reference-intensive (+1700). An appropriate use of review articles brings the reader up to the mid-1990s, while exhaustive citations of later advances, with a very notable number from 1999, characterize the bibliography. The table of contents is user-friendly, and the book sections are well cross-referenced. However, the scanty index and the omission of tabular layouts for several topics surveyed compromise the function of this rich text as a more standard reference work.

The author walks the reader through the overall strategies used in assessing the feasibility of transferring established solution chemistry to robust combinatorial syntheses directed at high-throughput screening. Advances in peptide and oligonucleotide solid-phase synthesis are chronicled, then important combinatorial applications to small organic molecule libraries are given special attention. The author's pharmaceutical industry background is sensed throughout the text, e.g., discussions of relative process cost-effectiveness, acceptable generation rate of discretes, and the craving for novel, bioactive, polyfunctional scaffolds as drivers for combinatorial decoration.

Upon completion of the Human Genome Project and its inclusion in the public domain, those industries which have most revolutionized high-throughput combinatorial technologies by miniaturization and automation may best be positioned to exploit new genomic targets for rapid drug development − ligand fishing using a virtual shotgun.

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