Book Reviews

Targeting of Drugs. 5. Strategies for Oligonucleotied and Gene Delivery in Therapy. Gregory Gregoriadis and Brenda McCormack, Eds. Plenum Press, 233 Spring St., New York, NY 10013, 1996. viii, 206 pp., illustrations. $125.

Artificial Self-Assembling Systems for Gene Delivery. Philip L. Felgner, Michael J. Heller, Pierre Lehn, Jean Paul Behr, and Francis C. Szoka, Jr., Eds. American Chemical Society, P.O. Box 57136, Washington, D.C. 20037-0136, 1996. vi, 200 pp., illustrations. $94.95.

These two recent publications deal with delivery of nucleic acids for the purpose of gene or oligonucleotide therapy. Both books offer a compilation of papers contributed by leaders in the field, and contain the published synopses of conference proceedings. The first, "Targeting of Drugs", contains the proceedings of the 8th NATO Advanced Studies Institute held in Cape Souinion, Greece (June 24 to July 5, 1995). The second, "Artificial Self-Assembling Systems," contains the proceedings of Cambridge Healthtech Institute meetings held in Wakefield, MA (September 28 to 29, 1995) and Washington, DC (October 10 to 11, 1995). As such, the contents of the two books may not represent up to the moment research breakthroughs, but they do offer insight into the diverse range of technologies that hold promise as in vivo DNA delivery vehicles.

Gene therapy was first envisioned 30 years ago as a means for correcting inherited genetic disorders. Since then, the scope of this technology has been broadened to include cancer and infectious disease as well. Yet, significant limitations remain with respect to low efficiency of gene delivery, short-lived expression, and safety concerns. In terms of gene delivery, there are many potential areas where efficiency can be improved, including targeting specific cell types or surface receptors, cellular uptake, escape from endosome (assuming endocytosis), internalization by the nucleus, and dissociation of agent(s) from DNA for transcription to take place. Each of these steps is dealt with in some way by the technologies described in the two books. In some instances the problem is merely acknowledged (e.g., dissociation of lipids from DNA), whereas in other cases practical examples are given on how the problem may be overcome (e.g., use of ligand/DNA complexes to target surface receptors). The scope of both books is broad, ranging from examples of treatments currently under investigation in human clinical trials (such as liposome-mediated transfer of CFTR DNA to treat cystic fibrosis), to examples of delivery vehicles that could in principle be applied to DNA but have not yet been tested (such as ceramic nanoparticles), to the application of cutting edge technologies to nucleic acid chemistry (such as the preparation of nanostructures which incorporate functional photonic or electronic properties to DNA).

Despite the commonality of the topic, there is surprisingly little overlap between the two books. Each book has chapters devoted to retroviruses, liposomes, polymers, and ligand-mediated receptor targeting, but only three groups have contributed chapters to both books (and one author deals with different topics in the two books). In addition, the two books, in part, focus on different aspects of the field. In "Artificial Self-Assembling Systems", the book is divided into two areas: Nucleic Acid Aspects addresses issues of vector design (e.g., replicating plasmids, synthetic retrotransposons, ribozymes), vector purity, and novel applications (e.g., electronic pulse delivery, photonic nanostructures); Synthetic Gene Delivery Systems covers various non-viral approaches to gene delivery (e.g., polymers, polyamidoamine dendrimers, cationic lipids, polycation condensed DNA). In "Targeting of Drugs", the opening two chapters (the first being an overview of the field of gene therapy together with the caveats and the second being an insiders view of an approach now in human clinical trials) set the stage for a collection of papers on assorted approaches ranging from simple (e.g., naked plasmid DNA vaccines for infectious disease) to complex (e.g., pH-sensitive liposome-encapsulated DNA for cancer).

In general, the appeal of "Artificial Self-Assembling Systems" is its coverage of some diverse novel and unproven technologies, while "Targeting of Drugs" gains its strength in its coverage of both biological and synthetic approaches and their practical applications. Hence, these books are complimentary and, taken together, present an excellent overview of the manifold efforts underway to bring gene therapy to fruition.

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Photostability of Drugs and Drug Formulations. Hanne Hjorth Tønnesen, Ed. Taylor and Francis, Rankine Road, Basingstoke, Hampshire, RG24 8PR, 1996. x, 405 pp., illustrations. $75.00.

While the introductory chapter of "Photostability of Drugs and Drug Formulations" suggests the book is to promote regulatory consistency by asking the questions of the rationale and what information can and is adequate for drug photostability, this is deceptively narrow in relation to the actual content of the book.

The first half of the book does provide an overview of the absorption spectra of drugs and the common reaction pathways, the technical requirements for producing light in a photostability test, reaction mechanisms, enhancing the stability of drugs by means of formulation and packaging, and the problems of instability during the manufacturing process. The book also addresses the regulatory inconsistencies and deficiencies in photodecomposition in the USP and NF. The design and interpretation of stability testing and the cursive mathematical modeling for drugs are provided. The final chapter discusses photoaccoustic spectroscopy in the study of photodegradation. In Chapter 7, Merrifield et al. emphasized the importance of understanding the chemistry, but in the examples the names of the compounds were not provided.

The unexpected surprises were chapters 8 through 10 which discuss the use of light-activated drugs for the purposes of drug targeting, in vivo activation and light phototoxicity of drugs, and photochemistry of biological toxicity. While these chapters seem

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out of place with the rest of the book, they do provide some interesting examples of the desirable and undesirable consequences of photodecomposition. Of special note are the appendices which provide the molecular structures of about 100 phototoxic compounds (chapter 11), useful definitions related to photodegradation (appendix 1), and a list of references arranged according to the drug substance they cover (appendix 2).

Overall, the book provides a unique contribution to the field of photostability. It represents an excellent introductory text with some topics developed sufficiently to be enlightening to individuals familiar with product development. I also believed the book represents an excellent supplementary text for graduate and advanced undergraduate courses dealing with drug stability.

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Pharmacological Treatment of Alzheimer's Disease: Molecular and Neurobiological Foundations. Jorge D. Brioni and Michael W. Decker, Eds. Wiley-Liss, Inc., 605 Third Ave., New York, NY 10158, 1997. xvi, 549 pp., illustrations. $89.95.

This book provides a wealth of new and pertinent information regarding advances in both the conceptual and practical issues involved in drug development for the treatment of Alzheimer's Disease. One of the particularly strong points of this body of work is that the editors included contributors from both industry and academia. This combination of perspectives represents the vanguard of science in the field of drug discovery. The book is divided into conceptual areas beginning with the Neurobiology of Cognition followed by Molecular Aspects of Alzheimer's Disease and ending with a section on Drug Discovery and Development.

In the section under Neurobiology of Cognition an important and often times overlooked aspect of books on pharmacological approaches, are chapters on the memory systems in the brain. The chapter by Kesner and Ragozzino provides an in depth discussion of memory systems and their complexity while the chapter by Salmon presents the neuropsychological features of Alzheimer's Disease.

In my reading of this book, I started with the last section and immediately read the excellent overview provided by Peter Whitehouse on the international public health problem of Alzheimer's Disease and the goals, strategies and outcomes of drug development. This chapter covered issues such as therapeutic approaches for the future and the impact that changes in the health care system has and will have on the treatment and care of individuals with Alzheimer's Disease. Also covered is the impact that the changes in funding of health care have had on research into the disease and development of therapeutic approaches. This chapter typified many of the contributions in that a specific problem was addressed in the context of a larger more global conceptualization of the issue. Another excellent example is the chapter by Joseph Rogers on Conceptual Issues in Research on Inflammation and Alzheimer's Disease. His review of the immune status of the brain and the role of inflammation in the pathogenesis of Alzheimer's Disease is straightforwardly and conceptually well written and is exciting to read.

Review of the important area of neurotrophic factors is well developed in several of the book's chapters. The timely topic of the role of apolipoprotein E in the neurobiology and pathogenesis of Alzheimer's Disease by Falduto and Ladu was well written and conceptually very clear. Grewal and Finch, who has written extensively on the evolution of aging biological systems, thoughtfully cover the topic of normal aging versus Alzheimer's Disease. Free radical damage and its role in amyloid toxicity and Alzheimer's Disease by Mattson and his colleagues is an excellent example of many of the book's chapters in that the conceptual area and basic information regarding the topic are clearly presented at the outset so that the reader can approach the rest of the chapter knowledgeable in the basics. Mattson and colleagues included multiple diagrams that facilitate understanding the complex biochemical signaling involved in free radical generation and perturbations in calcium signaling resulting from this biological insult. For anyone who thinks that neuroanatomy is just cataloging, think again and read the chapter by Solodkin and Van Hoesen. This chapter is an extensive review of the anatomical changes that occur in Alzheimer's Disease and, in addition, highlights the areas and cell populations in the brain that are spared in Alzheimer's Disease. This chapter is an in depth and reader friendly analysis of the secrets of the disease process revealed by the neuroanatomical profile and pondered by Van Hoesen and colleagues. One of the most intriguing aspects of this body of research is the observations of cell populations within the brain that are spared in the disease despite being juxtaposed to cell populations that are victims of the degenerative process.

For those interested in a thorough and exhaustive review of the cholinergic loss in Alzheimer's Disease and the development of treatment strategies focused on amelioration of the deficit, this book contains several chapters on the subject. An interesting addition to the area of cholinergic function in Alzheimer's Disease is the inclusion of the nicotinic receptors and their potential role in the development of therapeutic agents for the treatment of Alzheimer's Disease. Chapters on other neurotransmitter systems involved in learning and memory that are also effected in Alzheimer's Disease are also included. In the mind of this reviewer, the most exciting chapter in the area of neurotransmitter systems actually occurs in the final section. The chapter by Simpkins and colleagues discusses the fundamental role for estrogens in cognition and their potential neuroprotective effects on neurons affected in Alzheimer's Disease. This body of work, to which Simpkins has significantly contributed, represents an exciting and extremely important contribution to the use of estrogen replacement therapy as a strategy for the prevention and treatment of Alzheimer's Disease.

While the chapters vary with respect to the quality of overview, for the most part the contributions are concise, well written and conceptually driven treatments of the topics. I recommend the book to individuals with experience in the field who are interested in keeping abreast of current thinking in areas outside their own domain and to newcomers to the field. Both groups will benefit from the timely and well written contributions.

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Books Received

Dictionary

Stedman's Concise Medical Dictionary for the Health Professions. John H. Dirckx, M.D., Ed. Williams & Wilkins, A Waverly Company, 351 West Camden St., Baltimore, MD 21201-2436, 1997. lxxxiii, 1091 pp., illustrations +CD-ROM. (The attached CD-ROM works in both Macintosh and PC). $29.95

Drug Delivery

Controlled Drug Delivery: Challenges and Strategies. Kinam Park, Ed. American Chemical Society, P. O. Box 57136, Washington D. C., 20037-0136, 1997. xvii, 629 pp., illustrations. $145.95.

Selected Contents

1. Intracellular delivery and targeting
2. Delivery of peptides and protein drugs
3. Tissue engineering and gene therapy
4. New biomaterials for drug delivery
5. Modeling of controlled drug delivery

Liposomes in Gene Delivery. Danilo D. Lasic. CRC Press, Inc., 2000 Corporate Blvd., N. W., Boca Raton, Florida 33431, 1997. xi, 295 pp., illustrations. $59.95.

Selected Contents

1. Genosomes (DNA-Lipid complexes)
2. Structure-activity relationships
3. Mechanism of transfection
4. Other carrier systems and artificial virus

Polymers and Materials

Resins for Coatings. Dieter Stoye and Werner Freitag, Eds. Hanser Gardner Publications, Inc., 6915 Valley Avenue, Cincinnati, OH, 45244-3029, 1996. xvii, 458 pp., illustrations. $169.50.

Engineering Thermoplastics Polycarbonates- Polyacetals-Polyesters- Cellulose Esters. Ludwig Bottenbruch, Ed. Hanser Gardner Publications, Inc., 6915 Valley Avenue, Cincinnati, OH 45244-3029, 1996, xxi, 497 pp., illustrations. $198.00

Recycling and Recovery of Plastics. Johannes Brandrup, Muna Bittner, Walter Michaeli, and Georg Menges, Eds. Hanser Gardner Publications, Inc., 6915 Valley Avenue, Cincinnati, OH, 45244-3029, 1996. xxxiv, 893 pp., illustrations. $240.

Plastics Failure Guide Cause and Prevention. Myer Ezrin. Hanser Gardner Publications, Inc., 6915 Valley Avenue, Cincinnati, OH 45244-3029, 1996. xxi, 473 pp., illustrations. $127.50.

Experimental Design and Analysis

Fractal Geometry in Biological Systems. An Analytical Approach. Philip M. Iannaccone and Mustafa Khokha, Eds. CRC Press, Inc., 2000 Corporate Blvd., N. W., Boca Raton, Florida 33431, 1996. xvi, 360 pp., illustrations. $79.95.

Selected Contents

1. Molecules: Protein conformation and enzymatic kinetics
2. Cells: Factal studies of cellular morphology
3. Tissues: Applications of fractal geometry in pathology
4. Organs: Fractals and heart
5. Advanced topics in fractal geometry

PDQ Statistics. Geoffrey R. Norman and David L. Streiner. Mosby-Year Book, Inc., 11830 Westline Ind. Dr., St. Louis, MO 63146-3318, 1997. xvii, 188 pp., illustrations. Paper. $22.95.

Pharmaceutical Experimental Design and Interpretation. N. Anthony Armstrong and Kenneth C. James. Taylor and Francis, Rankine Road, Basingstoke, Hampshire, RG24 8PR, 1996. ix, 274 pp., illustrations. $65.00.

Pharmacology

Principles of Pharmacology: Basic Concepts & Clinical Applications. CD-ROM version. Paul L. Munson, Robert A. Mueller, and George R. Breese, Eds. Chapman & Hall, 115 Fifth Ave., New York, NY 10211-0906. $90.00. (The CD-ROM works in both Macintosh and PC).

Taurine 2 Basic and Clinical Aspects. Ryan J. Huxtable, Junichi Azuma, Kinya Kuriyama, Masao Nakagawa, and Akemichi Baba, Eds. Plenum Press, 233 Spring St., New York, NY 10013, 1996. xiii, 658 pp., illustrations. $139.50.

Recent Advances in Tryptophan Research: Tryptophan and Serotonin Pathways. Graziella Allegri Filippini, Carlo V. L. Costa, and Antonella Bertazzo, Eds. Plenum Press, 233 Spring St., New York, NY 10013, 1996. xvi, 766 pp., illustrations. $149.50.

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