cal outcomes and the "Ideal Procedure for Snoring and Obstructive Sleep Apnea." Together, they provide much food for thought for sleep surgeons and other health-care providers. Despite the progress of the past 25 years, sleep surgery remains in its infancy in terms of the available procedures, the selection among them, and the understanding of outcomes. Advances in our understanding of upper-airway physiology, snoring, and obstructive sleep apnea will enable better application of existing procedures and the development of new procedures to build on the foundations described in this book.

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Respiratory Genetics. Edwin K Silverman MD PhD, Scott T Weiss MD MSc, David A Lomas PhD ScD, and Steven D Shapiro MD, editors. London: Hodder Arnold/Oxford University Press. 2005. Hard cover, illustrated, 527 pages, $149.50.

Now that there is a much improved understanding of our genome, the search for genes that either directly cause disease or are associated with susceptibility or outcome in respiratory diseases has become a vibrant and fast-expanding field. This book has met the daunting challenge of summarizing the major findings in the genetics of multiple lung disorders and providing relevant methodological and clinical information.

The book has 4 major divisions: key concepts in respiratory genetics; obstructive lung diseases; interstitial lung diseases; and miscellaneous pulmonary conditions. Part 1, which focuses on key concepts in respiratory genetics, is divided into 8 chapters that introduce background information on the multifaceted research in respiratory diseases. The first chapter gives a very brief overview of human genetics and is well written, but could have been strengthened by expanding the focus beyond coding variation and by providing more details regarding haplotypes and microsatellites as key elements of disease susceptibility or modifying the phenotype (and not simply as tools to map the functional variants). The second chapter highlights the importance of environmental impact on the setting of the disease, and the heterogeneity of disease status. For the latter, the author's proposition of using different tests to characterize the phenotype is more than justified, with several tests listed, including measurement of lung function, airway responsiveness, allergy testing, and inflammation.

Chapter 3 provides a very good background on the methods for the study of association of genetic variants with disease susceptibility and how linkage disequilibrium is utilized in association studies, the advantages and disadvantages of cohort and case-control studies, environmental effects and the importance of power, and the spurious associations that can be caused by population stratification. Although without providing a definition or a clear scheme of what a haplotype is, the authors highlight the importance of haplotypes in association studies, in terms of power.

Chapter 4 guides the reader through basic procedures for sample collection and characterization of genetic variation, with helpful information on how to start the sample collection (which brings up issues of the ethics of managing data and how to collect the samples, depending on the interests and the number to collect) along with the most extended methods for extraction of deoxyribonucleic acid. The chapter ends with a very well organized and written summary of the types of genetic variation, the appropriate use of the different types, depending on the study design, and up-to-date methods to genotype and search for variation, with special emphasis on single-nucleotide polymorphisms (SNPs) and high-throughput approaches. Quality controls are needed to recognize and incorporate genotyping errors and reduce the chance of false positive or negative associations.

Chapter 5 is dedicated to bioinformatics methods; it provides a basic guide to several public databases to retrieve relevant bibliographic material (PubMed), sequences (Blast-Like Alignment Tool [BLAT]), and polymorphism information (dbSNP and SNPper) of the gene(s) of interest. Because of their relevance in association analyses, tools for power calculations and the exploration of linkage disequilibrium are expertly discussed. It would have enhanced this book to include other key databases for association studies, such as the HapMap, and the resequencing efforts of hundreds of inflammatory genes, such as the Seattle SNPs, the National Institute of Environmental Health Sciences (NIEHS) project, or the Innate Immunity database. The last portion of the chapter concerns microarray methods, practical guidelines to perform these experiments, probe alternatives, normalization, and detection of differentially expressed genes, clustering, and annotation. Chapter 6 outlines the available strategies to characterize and study the functional consequences of genetic variation and gives useful information about algorithms to allocate the genetic variation in the context of a gene (eg, promoter, splice site, and poly-A signal). The chapter also deals with the expression and purification of recombinant proteins, the biochemical and biophysical characterization of the "mutant" protein, and the determination of protein structure.

Expression of the "mutant" protein, particularly in mice, is an invaluable approach to study the phenotypical consequences in a cell context and constitutes the key bridge to the study of the functional consequences of the mutation, by providing additional physiologic changes that do not take place in a single cell; this is the focus of Chapter 7. This chapter presents the basics of obtaining genetically modified mice, several models used for different respiratory diseases, and a complete guide on general issues in mouse genomics, including quantitative trait loci (QTL) mapping, useful software, statistical interpretations, and their application to respiratory diseases.

Chapter 8 describes the respiratory-disease-related side of pharmacogenetics, which is a growing field with promising applications. This is a well written overview of the field; it discusses unequivocal measured phenotypes and has in-depth discussion of relevant examples related to smoking cessation, lung cancer, and asthma, among others.

The book's second part comprises 3 chapters that concentrate on the 3 best genetically characterized respiratory diseases: asthma, chronic obstructive pulmonary disease (COPD), and cystic fibrosis (CF). The chapter on asthma (Chapter 9) is a meticu-

lous review of the genetic findings in asthma, including genetic factors in asthma susceptibility. The astounding data collected by the authors include a review of twin studies, the evidence from linkage analysis and the use of isolated populations, the support from association studies, a review of the 10 most replicated genes, and mouse models in asthma. Lastly, the correlation of data derived from QTL mapping in mouse models with those from linkage studies in humans confer to this chapter the closing support for the connections of genetic variation and the susceptibility to asthma.

The chapter on COPD (Chapter 10) provides key COPD epidemiologic data, definitions of COPD, characterization of COPD severity, and the genetic basis of the disease. Though this is discussed primarily in the context of alpha-1 antitrypsin deficiency, a large list of genes associated with COPD is also provided, with occasional linkage to evidence from knockout mice. Because the major risk factor for COPD is tobacco smoke, genetic aspects of susceptibility to nicotine dependence are also discussed.

Chapter 11 reviews the genetic basis of CF caused by mutations in the CF transmembrane conductance regulator gene (CFTR) and the epidemiology and organ manifestations of the disease. The complexity of the gene, the number of known mutations, and the spectrum of phenotypes is discussed and connected to the animal models (knockouts or mice harboring mutations found in humans) and their use in clinical testing. Adequately discussed is the role of genetic testing in CF diagnosis. However, a significant number of CF patients with F508 mutations in CFTR do not develop the disease, so the stratification of mutations in human populations as a major drawback of genetic testing for diagnosis of CF should have been considered in this chapter.

The book's third part has 2 chapters, which focus on idiopathic pulmonary fibrosis and sarcoidosis. Chapter 12 presents a thorough list of clinical features of idiopathic pulmonary fibrosis and emphasizes the changes in lower lung function, and morphological and histological changes in the lungs. Very useful information is provided on the epidemiology of the disease and current treatments. The evidence supporting the involvement of genetic factors in the development of the disease is based on clues from monogenic disorders associated with pulmonary fibrosis and from animal models.

Chapter 13 introduces the evidence on the genetic basis of sarcoidosis, the most apparent coming from the epidemiology of the disease, since it is more common in populations of African descent than in Asian or European populations. The authors also present the hypothesis that sarcoid antigen triggers the disease, which is congruent with the described seasonal clustering of this condition and current experimental data. Although only a few linkage studies have been conducted to date, the candidate gene association studies are congruent in that they show the contribution of the human leukocyte antigen region, cytokines, and chemokines in the development of the disease. Although there have been no animal models for this disease, other relevant conditions (eg, chronic beryllium disease) are discussed to provide new candidate genes that may be useful for unraveling the pathogenesis of sarcoidosis.

The book's fourth part has 5 chapters, which introduce pulmonary hypertension, lung cancer, respiratory infections, congenital, metabolic, neuromuscular diseases, and rarer lung diseases. Particularly well written is the discussion of genetic anticipation in the younger generations in families with primary pulmonary hypertension and the links to candidate genes that affect the disease. In this respect, the bone morphogenetic protein receptor type II (BMPR2) gene is deeply examined with regard to how known mutations exert the phenotype.

Chapter 15 describes the genetics of lung cancer and provides a detailed and well-written discussion of studied candidate genes and somatic mutations that accumulate in cancers and how this information may drive the choice of chemotherapies in the future.

Chapter 16 reviews the involvement of genetic variation in susceptibility to respiratory infections, but the chapter does not have the depth of the earlier chapters, particularly with regard to genetic polymorphisms associated with respiratory infections, given that several candidate genes have now been associated with sepsis and acute lung injury.

Chapters 17 and 18 constitute a brief background on rare monogenic and complex diseases that compromise pulmonary function, and the chapters include excellent illustrations for human diagnosis.

In summary, the book is an excellent review of the most common tools and applications in the exploding field of human genetics and is a state-of-the-art opus for investigators of common but complex lung diseases. This is a major text and an invaluable aid to nascent translational scientists interested in the basics of the study of genetic variation and its functional consequences in respiratory disease.

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Pulmonary Rehabilitation. Claudio F Donner MD, Nicolino Ambrosino MD, and Roger S Goldstein FRCP(c), editors. London: Hodder Arnold/Oxford University Press. 2005. Hard cover, illustrated, 405 pages, $149.50.

Within the past decade, pulmonary rehabilitation has become more recognized and valued in treating chronic lung disease. Despite this professional acceptance, there is a paucity of pulmonary rehabilitation texts. Donner et al collaborated with North American and European authorities to create a comprehensive text on current pulmonary rehabilitation techniques and conventions. This text is divided into 4 parts and 40 chapters. Each chapter is succinctly written and well referenced; lists of key points provide clear and concise content summations.

Part 1 is divided into 6 chapters that cover the foundations of pulmonary rehabilitation, including: definition and rationale for pulmonary rehabilitation; international trends in the epidemiology of chronic obstructive pulmonary disease (COPD); pathophysiologic basis of pulmonary rehabilitation in COPD; influence of tobacco smoking on lung disease; genetics of airflow limitation; and using rehabilitation literature to guide patient care. Overall, these topics evidence pulmonary rehabilitation justification and application. For example, Chapter 6 emphasizes the importance of evidence-based medicine in pulmonary rehabilitation direction and optimization.

Part 2 (11 chapters) addresses the need for outcome measurement and the assessment of lung function and respiratory mechanics, respiratory muscles, peripheral muscle function, respiratory function dur-