Methods in Molecular Medicine: Microarrays in Clinical Diagnostics. Thomas O. Joos and Paolo Fortina, editors. Totowa, NJ: Humana Press, 2005, 288 pp., $121.50, hardcover. ISBN 1-58829-394-7.

Microarray technology has become a mainstay of biological research. Since their evolution in the mid-1990s, DNA microarrays have revolutionized the field of genomics and genetics and have spawned new allied technologies, including protein, carbohydrate, and small-molecule arrays. The roadmap to this now mature technology was pegged with novel solutions that addressed various problems related to throughput, detection limits, selectivity, and data interpretation. The application of these technologies to clinical research has allowed scientists at the bench as well as in the clinic to harness their potential toward drug discovery. Several of these applications, and their extensions, are described in this book that, in keeping with others in the series Methods in Molecular Medicine, follows a detailed, protocol-based format in describing many of these techniques related to DNA and protein microarrays.

The book is divided into 15 chapters that can be broadly grouped under DNA microarrays, antibody microarrays and immunoassays, and methods to optimize sample quality as well as the resulting data. Francis Barany and coworkers describe applications of their PCR/ligase detection reaction/universal DNA microarray strategies, which allow for single-nucleotide polymorphism (SNP) genotyping and copy number analyses. The successful development of this methodology for multiplex detection of disease-related alleles has been demonstrated in cystic fibrosis and breast cancer. The authors also describe variations on this theme as a tool for DNA methylation analysis. The use of asymmetric, multiplex nested reverse transcription-PCR, coupled with a 70mer DNA microarray for detection of the severe acute respiratory syndrome (SARS) coronavirus, is described by Cheng and coworkers. The use of tag arrays for minisequencing of SNPs has been well described by Ann-Christine Syvanen’s group in chapter 4. This is followed by a detailed description of Nanogen’s microarray technology for genotyping applications. Two chapters are dedicated to the use, in diagnostic testing, of the non–PCR-based Invader technology for thrombophilia and the application of Lumines’ xMAP suspension array technology for cystic fibrosis screening.

The chapter on noncontact laser microdissection and pressure catapulting offers a detailed look at the use of laser capture microdissection for obtaining pure populations of cells for genomic analysis. However, the authors fail to compare their technique with other methods in the field, including the Arcturus system. A novel use of acoustic waves for enhancement of oligonucleotide hybridization is offered in chapter 7.

The second half of this book is devoted to protein microarrays. Predki and coworkers describe their pioneering work on the development of yeast proteome microarrays. This is followed by an excellent description of the use of antibody microarrays for multiplexed protein analysis. Multiplexed sandwich assays for cytokine profiling are currently used in many laboratories. Prabakar and coworkers describe the efforts at Centocor to develop flow cytometric immunoassays to profile patients with autoimmune diseases. These assays, which measure the concentrations of a 6-cytokine panel, show that these methods provide useful data, although they are inherently affected by the problems encountered with 2-site immunoassays and by the presence of other proteins in biological samples, which has limited the development of these assays to multiplexing many targets. Kricka and Master highlight some of these problems with protein microarrays and the quality-control metrics required for development of this growing technology into a fully mature field similar to DNA microarrays.

The final chapter offers a brief view into tissue microarrays, which have been shown to be very useful in clinical diagnostics. The authors aptly identify the need for trained pathologists and laboratorians in development of this yet-to-be-exploited technology.

Overall this book offers a good read to both clinicians and researchers at the bench who wish to enter the field of microarrays. The format of the book also provides a good roadmap to graduate students wishing to translate aspects of their research to methods amenable to microarrays.

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Lab Dynamics: Management Skills for Scientists. Carl M. Cohen and Suzanne L. Cohen. Woodbury, NY: Cold Spring Harbor Laboratory Press, 2005, 176 pp., $59.00, hardcover. ISBN 0-87969-741-5.

As scientists, we are adept at optimizing efficiency and performance in our experimental methods, technology development, analytical and numerical models, and business systems, but we are often blind to the huge impact that social dynamics and inadequate interpersonal skills have on our time and effort, staff retention, collaboration, and interaction with management. Lab Dynamics is a highly understandable and practical book that equips the reader with the basics for developing the requisite “soft skills” that can significantly enhance technical productivity and promote career satisfaction and advancement.

The authors speak from experience and authority, one being a scientist and leader from academia and the private sector, and the other a profes-
sional psychologist. Accompanying each chapter are relevant case studies, exercises, and experiments drawn from the authors’ personal experiences in the laboratory and from workshops they have conducted with scientists. Topics include emotional intelligence, effective communication, and negotiation. Self-awareness exercises are provided to help readers recognize and confront their life-long behavioral personalities and the consequences of that behavior on their own effectiveness and productivity. The exercises often compel one to pause and think about how to “unlearn” deeply engrained traits developed over years.

Henry Kissinger purportedly said that “university politics are vicious precisely because the stakes are so small,” an observation that scientists can often identify with. Professionals early in their careers are often thrust into situations with little or no leadership training, for example, mentoring the next generation of postdocs and students, or recognizing and resolving confrontation with peers and supervisors. Scientists are particularly in need of leadership training, for studies have indicated that conflict avoidance and unawareness are more pronounced in scientists than in other professionals. To help break the chain of counterproductive interpersonal behavior promulgated from one generation to the next, Lab Dynamics introduces the reader to the principles of emotional intelligence. Practical advice is offered on self-awareness, communication, motivation, mood management, relationships, and how to transform confrontation into a problem-solving opportunity for all. Readers can benefit further from the many books devoted to this subject (e.g., Emotional Intelligence at Work, the Untapped Edge for Success, by H. Weisinger; Jossey-Bass, 1998).

Also useful are the comparisons and contrasts between research in academe and industry. Lab Dynamics can help scientists entering the private sector become aware of how their performance will be evaluated. Teamwork, communication, integration and alliances with business units, and project management discipline are expected and valued in the private sector, in addition to the discovery science that the scientists are hired to perform.

Effective negotiation skills are an essential asset for scientists. These skills are needed on a regular basis, for example, in the determination of publication authorship; in the allocation of human, financial, and infrastructure resources; and in the determination of project scope, schedule, cost, and risk with a sponsor or supervisor. The authors correctly stress the importance of negotiation skills and provide an excellent overview. The reader may benefit by going directly to some of the source material used and cited by the authors, especially the best sellers from the Harvard Negotiation Project, Difficult Conversations: How to Discuss What Matters Most by D. Stone, B. Patton, and S. Heen (Penguin Books, 2000); Getting to Yes: Negotiating Agreement Without Giving In, by R. Fisher, W. Ury, and B. Patton (Penguin Books, 1991); and Getting Past No: Negotiating Your Way from Confrontation to Cooperation, by W. Ury (Bantam Books, 1993). These short classics are must-reads for all scientists, and they introduce additional concepts not presented in Lab Dynamics, such as developing best alternatives to negotiated agreements.

Whether they are in management or not, scientists at all stages of their careers will find Lab Dynamics a useful guide. Experienced leaders will find it a practical refresher in mastering their skills, whereas nonmanagement and early-career professionals will find it much more than a survival handbook.

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