

Preface

Bioengineering in Otolaryngology



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Guest Editor

This issue of the *Otolaryngology Clinics of North America* reflects three basic trends in biomedical technology research, development, and transfer and, more specifically, their application to otolaryngology-head and neck surgery.

First, in the life sciences, interdisciplinary collaboration in discovery and development has become the norm. Interactions between scientists and engineers in the fields of biology, chemistry, physics, photonics, computer science, aerospace engineering, nanotechnology, and materials science have spawned a new generation of smart materials, microelectronics, and intelligent biomedical clothing. All of these inventions have emerging applications in otolaryngology.

In an effort to facilitate and coordinate bioengineering research, The National Institute of Biomedical Imaging and Bioengineering was formed a few years ago as the newest addition to the National Institutes of Health. The mission of the National Institute of Biomedical Imaging and Bioengineering is to improve health by promoting fundamental discoveries, design and development, and translation and assessment of technologic capabilities in biomedical imaging and bioengineering, enabled by relevant areas of information science, physics, chemistry, mathematics, materials science, and computer sciences. In addition, the National Institutes of Health has highlighted interdisciplinary collaboration as a key component of its new strategic plan, placing cross-disciplinary partnerships at the top of its funding priorities. An Alliance for Nanotechnology at the National

Cancer Institute has been formed, and the National Science Foundation is sponsoring the formation of Nanocenters of Excellence around the United States.

The acceleration of technology transfer is a second theme. Universities and colleges are increasingly realizing the value of intellectual property invented by their faculties. A 2002 report from the Association of University Technology Mangers noted that

- Running royalties on product sales were \$1.005 billion, an 18.9% increaser over fiscal year 2001.
- In fiscal year 2002, 450 new companies were established for a total of 4320 since 1980.
- At the end of fiscal year 2002, 2741 of those start-ups were still operating.

Millions of dollars in revenue are being realized by commercializing ideas that otherwise would have sat on the shelf. This push to the marketplace has benefited patients and providers and has fueled the impressive growth of medical device companies, biotechnology start-ups, and the necessary service providers that are essential to their formation. The devices and innovations described in this volume are but a few of the applications in otolaryngology.

In addition to interdisciplinary collaboration and technology transfer, this book also reflects the third major trend—increasing academic–industry collaboration. A new generation of bioentrepreneurs and faculty inventors are working together to invent, commercialize, and finance exciting new ventures. As a result of the emergence of national and international bioclusters, workforce development and training in pharmaceutical biotechnology and bioengineering has rapidly moved to the top of the economic development agenda in numerous states and countries that are eager to take advantage of well-paying jobs, clean industries, and tax revenues. Several of the authors in this book are bioentrepreneurs, having started life science companies from discoveries made at universities.

I would like to thank the authors and industry colleagues who have contributed to this issue of the *Otolaryngology Clinics of North America*. In addition, I would like to congratulate the editors at Elsevier for recognizing the emerging importance of bioengineering and for publishing this groundbreaking book. I hope that future publications will describe bioengineering advances in specialties other than otolaryngology.

Despite the naysayers who whine about how the health care sky is falling, this is an exciting time in the history of science and health care innovation. New health care products and services will continue to emerge at an accelerating pace, forcing us to debate the important social, economic, and ethical issues they will present. The authors and I, representatives from both

academia and industry, hope you enjoy this issue, a brief glimpse into the future of bioengineering in otolaryngology.

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