FOREWORD

There are ~18,000 new cases of glioma diagnosed in the USA alone and their incidence has been growing; they represent up to 33% of all primary brain tumors. Around 13,000 of patients with malignant gliomas die every year and the ratio of incidence vs. mortality is indicative of the substantial challenge that gliomas present in medical practice. Aside from their impact on survival, gliomas, by virtue of their site of origin and growth characteristics, also have the potential to profoundly influence elemental capabilities such as movement, thought, speech and attention. As such, these tumors produce disproportionate effects on health and well-being of afflicted individuals.

Gliomas arise from all three types of cells supporting neurons in the brain or spinal cord: astrocytes, oligodendrocytes and ependymal cells. These different lineages produce characteristic appearances when examined under classic light microscopy, the traditional method of diagnosing different types of glial neoplasms. Most recent classification schemes, however, have been based on both histological and molecular criteria—the latter also allowing for new insights into pathogenesis and also novel, targeted therapies.

The last several decades have produced and accelerated our collective understanding of glioma etiology along with the genetic and molecular underpinnings of these diseases. Unfortunately, these insights have yet been translated into noteworthy clinical benefits for patients. One of the major and relatively recent discoveries of some significance came with the identification of mutations in the isocitrate dehydrogenase (IDH) 1 and 2 genes. This and other findings now point to the importance of metabolism in determining both the aggressiveness and therapeutic susceptibility of various gliomas. However, despite improved prognostic methods based on advanced molecular and biochemical analyses, longstanding therapies—surgery, radiation therapy, and chemotherapy—remain the mainstay of gliomas treatment, with occasional other adjunctive modalities like TTFields or Avastin. It is thus quite apparent that a magnified effort is needed in order to unlock other genetic/metabolic pathways in gliomas and exploit novel scientific insights to invent/apply new approaches to their treatment.

This book touches upon several critical aspects of glioma research and clinical therapies. The contributors represent a wide range of expertise from different disciplines. There is a considerable emphasis here on translational efforts ranging from pre-clinical investigations to clinical studies. Several chapters discuss metabolic processes in gliomas as potential therapeutic targets with specific examples of drug candidates currently under evaluation. Another aspect discussed by other authors is the issue of genetic and molecular information leading potentially to better prognostication and integration of pre-clinical knowledge with practice

to promote enhanced patient outcomes. As such, this book will likely be interest to a wide audience seeking more information on challenges gliomas present to both scientists and clinicians.

Anthony L. Asher, MD, FAANS, FACS
President, Neuroscience Institute, Atrium Health
Clinical Professor of Neurological Surgery,
UNC Chapel Hill and Vanderbilt University
Treasurer, American Association of Neurological Surgeons
Carolina Neurosurgery and Spine Associates
Charlotte, NC, USA
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