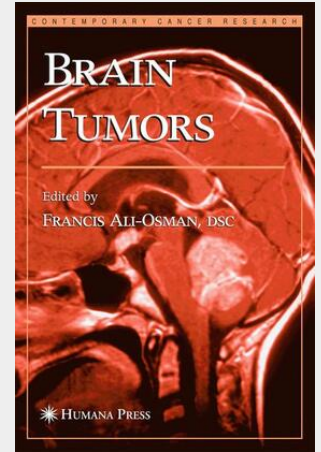


Brain Tumors

Exciting new developments and discoveries of the last two decades are beginning to shed light on the complex biology of brain tumors and are advancing our understanding of the cellular and molecular processes involved in their initiation, progression, and clinical and biological behavior. The disease process in brain tumors is quite complex and the resulting tumors are characterized by a high degree of biological and clinical diversity. Thus, despite the advances of the last two decades, prognosis for patients with malignant brain tumors remains abysmal. Significant progress in the diagnosis, treatment and, ultimately, prevention of these tumors will require both the harnessing of the advances in basic and clinical brain tumor research, and a continuing concerted effort at increasing our understanding of brain tumor biology, in particular, the molecular genetic changes and perturbations of cellular pathways involved in brain oncogenesis and which drive the biological and clinical behavior of the tumors. Brain tumor diagnosis and prognosis, which is still largely based on histopathology and other clinical criteria, will, in the future, acquire a significant molecular component, with the incorporation of knowledge of genes that are mutated, over-expressed, deleted, silenced, or functionally altered in the tumors. Treatment strategies for brain tumors, rather than being empirical, will be rationally developed based on an understanding of the cellular and molecular mechanisms and targets that have been activated, suppressed, or otherwise altered.

A comprehensive guide for both scientists and clinicians to recent advances in our understanding of the cellular and molecular processes involved in the initiation, progression, and clinical and biological behavior of brain tumors. The authors review the latest findings on the molecular biology, genetics, epidemiology, and pathology of brain tumors, detailing new knowledge about molecular profiling, molecular pathology and classification, in vitro and in vivo brain tumor models, brain metastasis, and progenitor cell biology. They also discuss in depth the cellular and genetic pathways involved in brain oncogenesis, malignant progression, and therapeutic response, highlighting oncogenes and tumor suppressor genes, DNA damage and repair, invasion and migration, cell cycle, growth factors, signaling, apoptosis, and developmental biology. The discussion of brain tumor therapy focuses on advances in pharmacological thinking, therapeutic modalities, novel therapeutic targets, rational drug design, gene and viral therapies, drug delivery and the blood-brain barrier, immunotherapy, and brain imaging.



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