Neuroglia

NG2-Glia (Polydendrocytes)Drosophila GliaGlial Plasticity in DepressionAlexander DiseaseYoumans and Winn Neurological Surgery E-BookCrucial Role for Astrocytes in EpilepsyHealthy AgingNeuronal mechanisms of epileptogenesisEntrainment of Biological RhythmsNew ScientistOncoquestAdvances in Neuroglia Research and Application: 2011 EditionNeuroglia in the Healthy Nervous System, Part INeuron-Glia Interaction in Neuroinflammation Arthur M. Butt LinFang Wang João F. Oliveira Albee Messing H. Richard Winn Peter Bedner Patrick P. Coll Roberto Di Maio Rodolfo Costa Akio Suzumura

NG2-Glia (Polydendrocytes) Drosophila Glia Glial Plasticity in Depression Alexander Disease Youmans and Winn Neurological Surgery E-Book Crucial Role for Astrocytes in Epilepsy Healthy Aging Neuronal mechanisms of epileptogenesis Entrainment of Biological Rhythms New Scientist Oncoquest Advances in Neuroglia Research and Application: 2011 Edition Neuroglia in the Healthy Nervous System, Part I Neuron-Glia Interaction in Neuroinflammation *Arthur M. Butt LinFang Wang João F. Oliveira Albee Messing H. Richard Winn Peter Bedner Patrick P. Coll Roberto Di Maio Rodolfo Costa Akio Suzumura*

classically the central nervous system cns was considered to contain neurons and three main types of glial cells astrocytes oligodendrocytes and microglia now it has been clearly established that ng2 glia are a fourth glial cell type that are identified and defined by their expression of the ng2 chondroitin sulfate proteoglycan cspg4 ng2 glia differentiate into oligodendrocytes the myelin forming cells of the cns under the control of multiple extacellular and intrinsic factors due to this ng2 glia are often referred to in the literature as oligodendrocyte progenitor cells opcs the name polydendrocytes has been suggested for ng2 glia opcs to emphasize their nature as a fourth distinct glial cell type ng2 glia respond rapidly to neurotransmission via their synaptic connections with neurons and their repertoire of neurotransmitter receptors and ion channels bidirectional interactions between ng2 glia and neurons are also important for synaptic function and neuronal integrity ng2 glia respond to most neuropathologies by increased proliferation and differentiation into

oligodendrocytes which is critical for replacing damaged myelin after injury and in demyelinating diseases such as multiple sclerosis there is also evidence ng2 glia are capable of generating astrocytes and neurons under some circumstances the full capacity of ng2 glia is not yet clear but their key function is the lifelong generation of oligodendrocytes which is absolutely critical for cns function and integrity

glia the non neuronal cells in the nervous systems are both passive and active participants in diverse arrays of neuronal function the diversity of glial cells in various animal species appears to be correlated with the complexity of brains in the animal drosophila melanogaster glia are similarly categorized to their mammalian counterparts in morphology and function surface glia cover the outermost surface of the brain and function as a blood brain barrier to protect the nervous system cortex glia similar to mammalian astrocytes enwrap around the neuronal cell bodies and provide trophic support neuropil glia similar to mammalian astrocytes and oligodendrocytes are closely associated with the synapse enriched neuropils and regulate synapse formation synaptic function and underlie the mechanism of circuit and behavior this short monograph focuses on drosophila glia discusses the classification of different glial subtypes and their developmental origins and provides an overview of different glial mediated activity crucial for the development and function of the nervous system this context serves as a general introduction to the molecular and cellular basis of glial function in normal and pathological brains

major depression is a highly prevalent disorder that poses a significant social burden in society nowadays the pathophysiology of this disease is still poorly understood but growing evidence suggests that impaired neuron and glial plasticity may be a key underlying mechanism for the precipitation of the disorder one of the most surprising findings in this field was the involvement of glial cells in the pathophysiology of major depression and in the action of antidepressants namely in mechanisms related with adult neurogenesis imbalances or dendritic arborization impairments in particular several works refer to alterations in the morphology and numbers of astrocytes microglia and oligodendrocytes in the context of depression in human patients or animal models of depression these observations were linked to functional evidences and suggested to underlie the pathophysiology of depression among others these include impairments in the cross talk between glia and neurons changes in the level of neurotransmitter or immunoactive substances myelination status synapse formation maintenance or elimination in addition to the implication

of glia in the pathophysiology of depression a number of studies is ascribing glia pathways to classically accepted antidepressant mechanisms therefore it is noteworthy to elucidate the role of glia in the effect provided by antidepressant treatment in order to better understand secondary effects and elucidate alternative targets for treatment

this book offers a comprehensive overview of alexander disease a rare and devastating neurological disorder that often affects the white matter of the brain and spinal cord its distinctive neuropathology consists of abundant rosenthal fibers within astrocytes one of the four major cell types of the central nervous system nearly all cases are caused by variants in the gene encoding the intermediate filament protein gfap but how these changes in gfap lead to the widespread manifestations of disease is poorly understood astrocytes while discovered over a century ago are themselves still much of a mystery they exhibit considerable diversity defy precise definition and yet actively regulate many aspects of nervous system functioning we also have incomplete understanding of rosenthal fibers odd structures that contain gfap as just one of many components whether they are toxic or protective is unknown moreover rosenthal fibers are not absolutely unique to alexander disease and are seen sporadically in a wide variety of other conditions including brain tumors and multiple sclerosis gfap is the third unknown it is an ancient protein arising early in the evolution of vertebrates but its role in normal biology is still a matter of debate yet alexander disease shows without a doubt that changing just a single of its 432 amino acids can lead to catastrophe not just in the astrocytes where gfap is produced but also in the other cells with which astrocytes interact despite all of the unknowns much has been learned in the past 20 years and it is time to share this knowledge this book is intended for recently diagnosed patients and families as well as non specialist researchers interested in this neurological disease it covers historical origins the state of current knowledge and prospects for what lies ahead with citations to the primary literature given throughout

widely regarded as the definitive reference in the field youmans and winn neurological surgery offers unparalleled multimedia coverage of the entirety of this complex specialty fully updated to reflect recent advances in the basic and clinical neurosciences the 8th edition covers everything you need to know about functional and restorative neurosurgery deep brain stimulation stem cell biology radiological

and nuclear imaging and neuro oncology as well as minimally invasive surgeries in spine and peripheral nerve surgery and endoscopic and other approaches for cranial procedures and cerebrovascular diseases in four comprehensive volumes dr h richard winn and his expert team of editors and authors provide updated content a significantly expanded video library and hundreds of new video lectures that help you master new procedures new technologies and essential anatomic knowledge in neurosurgery discusses current topics such as diffusion tensor imaging brain and spine robotic surgery augmented reality as an aid in neurosurgery ai and big data in neurosurgery and neuroimaging in stereotactic functional neurosurgery 55 new chapters provide cutting edge information on surgical anatomy of the spine precision medicine in neurosurgery the geriatric patient neuroanesthesia during pregnancy laser interstitial thermal therapy for epilepsy fetal surgery for myelomeningocele rehabilitation of acute spinal cord injury surgical considerations for patients with polytrauma endovascular approaches to intracranial aneurysms and much more hundreds of all new video lectures clarify key concepts in techniques cases and surgical management and evaluation notable lecture videos include multiple videos on thalamotomy for focal hand dystonia and a video to accompany a new chapter on the basic science of brain metastases an extensive video library contains stunning anatomy videos and videos demonstrating intraoperative procedures with more than 800 videos in all each clinical section contains chapters on technology specific to a clinical area each section contains a chapter providing an overview from experienced section editors including a report on ongoing controversies within that subspecialty enhanced ebook version included with purchase your enhanced ebook allows you to access all of the text figures and references from the book on a variety of devices

this book summarizes current evidence of astrocyte dysfunction in epilepsy and discusses presumed underlying mechanisms epilepsy is characterized by the periodic occurrence of seizures currently available anticonvulsant drugs and therapies are insufficient to controlling seizures in about one third of patients thus there is an urgent need for new therapies that prevent generation of the disorder and improve seizure control in individuals already afflicted the vast majority of epileptic cases are of idiopathic origin with their underlying mechanisms being unclear neurosurgical specimens from patients presenting with mesial temporal lobe epilepsy mtle demonstrate marked reactive gliosis since recent studies have

implicated astrocytes in important physiological roles in the cns such as synchronization of neuronal firing it is plausible that they may also have a role in seizure generation and or seizure spread in support of this view various membrane channels receptors and transporters in astrocytic membranes are altered in the epileptic brain excitingly recent evidence suggests that in the course of the pathogenesis of mtle these glial changes alter homeostatic network functions and temporally precede the alterations in neurons these findings might eventually classify mtle as a glial rather than a neuronal disorder and identify astrocytes as promising new targets for the development of more specific antiepileptogenic therapeutic strategies although research on astrocytes in epilepsy is still in its infancy this book clearly demonstrates a critical role of astrocytes in the disturbance of k and transmitter homeostasis and its impact on seizure generation

this book weaves all of these factors together to engage in and promote medical biomedical and psychosocial interventions including lifestyle changes for healthier aging outcomes the text begins with an introduction to age related changes that increase in disease and disability commonly associated with old age written by experts in healthy aging the text approaches the principles of disease and disability prevention via specific health issues each chapter highlights the challenge of not just increasing life expectancy but also deceasing disease burden and disability in old age the text then shifts into the whole person implications for clinicians working with older patients including the social and cultural considerations that are necessary for improved outcomes as baby boomers age and healthcare systems worldwide adjust healthy aging is an important resource for those working with older patients including geriatricians family medicine physicians nurses gerontologists students public health administrators and all other medical professionals

several types of brain injuries are causes of acquired temporal lobe epilepsy tle the seizure free latent period that often follows the brain injury is of unknown mechanistic significance but is commonly considered as the epileptogenic period characterized by gradual pathogenic processes leading to the onset of clinically detectable epilepsy acute convulsive status epilepticus se is often associated with an adverse developmental outcome characterized by learning disabilities related to the cumulative effects of seizures and development of tle the symptomatic manifestations of tle appear only after a widespread irreversible damage of entorhinal cortex and hippocampus the brain area most affected by this disease

these pathological features of tle reduce the possibility of successful therapeutic approaches often rendering the disease refractory the difficult clinical management of chronic tle and the limited success rate of surgical approaches increase the incapacitating nature of this specific epileptic disorder prevention of tle with an appropriate intervention after a known inciting event in the case of acquired epilepsy might represent the most ambitious goal in the clinical treatment of this epileptic disorder but has been largely unsuccessful to this point clinical trials aimed at prevention of chronic epilepsy have often produced negative disappointing results however in most cases these studies ultimately evaluated the downstream clinical manifestations failing to monitor early specific molecular epileptogenic events therefore elucidation of the underlying mechanisms of epileptogenesis and their time course s are essential the primary purpose of this topic is to collect scientific contributions providing novel insights in the cellular and molecular mechanisms of epileptogenesis as potential targets for innovative therapeutic approaches aimed at preventing the chronic epileptic disorder

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neuroglia in the healthy nervous system part i provides insights into newly emerging developments in neuroglia biology focusing on the healthy nervous system driven by advances in genetics transcriptomics electrophysiological and imaging techniques this volume bridges the gap between neuroglia basic science and neuroglia clinical research the book provides an overview of neuroglia biology highlighting emerging technologies used to unravel the role of neuroglial cells in specific brain functions the book also discusses strategies using neuroglia as a therapeutic target provides an

overview of neuroglia biology identifies normal neuroglia function in the healthy nervous system includes animal and human research discusses transcriptomic electrophysiological and imaging techniques to study neuroglia covers research using neuroglia as a therapeutic target

accumulation on glia is an active pathological element in many neurological disorders gliosis produces neuroinflammation through both neurotrophic and inflammatory means but the exact mechanism through which this happens remain unclear it is suspected that damage to neurons activates the growth of glial cells the proposed book focuses on the interaction between neurons and glia to help elucidate the pathophysiology of neuroinflammation in neurological disorders

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