

Book review

Open Access

An important reference book for research on barriers between blood and the CNS

Hazel C Jones*^{1,2}

Address: ¹Department of Pharmacology, University of Florida, Gainesville, FL 32610, USA and ²Gagle Brook House, Chesterton, Bicester, Oxon OX26 1UF, United Kingdom

Email: Hazel C Jones* - hjones@ufl.edu

* Corresponding author

Published: 12 June 2005

Received: 01 June 2005

Cerebrospinal Fluid Research 2005, **2**:1 doi:10.1186/1743-8454-2-1

Accepted: 12 June 2005

This article is available from: <http://www.cerebrospinalfluidresearch.com/content/2/1/1>

© 2005 Jones; licensee BioMed Central Ltd.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/2.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Book details

Blood-Spinal Cord and Brain Barriers in Health and Disease
Edited by: Hari Shanker Sharma, Jan Westerman. Elsevier Academic Press, San Diego, CA; 2004. Library of Congress Publication Control Number: 2003102998, ISBN: 0-12-639011-8, 605 pages, £110.00, reviewed by Hazel C. Jones, University of Florida.

The health of the central nervous system (CNS) is a subject that impacts on all people and especially on those who have the misfortune to be afflicted by CNS injury or disease. The cerebrovascular barriers at the CNS capillaries and the choroid plexus play a vital role in maintaining the microenvironment of the cells in the brain and spinal cord. The stated aim of this book is to act as a stimulus for research directed towards minimizing the effects of CNS stress, injuries and insults. With seven sections that include 27 chapters from 59 contributors and 605 pages in total, this book covers many topics including: basic aspects of the barriers, *in vitro* models, physiological transport mechanisms, neurochemical mediators, stress situations, changes in disease conditions and clinical aspects. Each chapter consists of a review, together with up-to-date original data. The chapters are laid out clearly in a consistent format with informative illustrations.

This is an important wide-ranging book aimed at researchers in neuroscience, drug discovery and development, and neuropathology. Although large, it contains a wealth of information on contemporary research with an impressive 29-page index from *arachadonic acid* to *zonula occludens proteins*. The bulk of the text deals with research relating to the cerebrovascular barriers in the brain. However, in contrast with past books on the blood-brain bar-

riers, this one contains several chapters concerned with the blood-spinal cord barrier. Considering the volume of research on spinal cord injury in recent decades, this serves as a useful source of information and a reminder that barrier function is important throughout the CNS. Furthermore, it reinforces the probability that information obtained from research on barriers in the brain can be applied to the therapeutic treatment of spinal cord injury.

One rather disappointing aspect of this otherwise excellent book is the small amount of space devoted to the choroid plexus and the cerebrospinal fluid (CSF). This is the alternative route to the brain, the blood-CSF barrier with somewhat different properties to the blood-brain barrier. Only two chapters contribute to this very important aspect of brain homeostasis and to the potential for manipulation of the CSF for diagnostic and therapeutic purposes.

Overall, 'Blood-Spinal Cord and Brain Barriers in Health and Disease' is a contemporary and very informative volume that should be a ready source of reference for all researchers and clinicians concerned with the CNS in health and disease.

Competing interests

The author(s) declare that they have no competing interests.

Authors' contributions

Sole author

The blood brain barrier is a dynamic and plastic anatomical and functional system, which plays, under normal conditions, an important always role, in establishing and maintaining the homeostasis in the central nervous system. The inter endothelial cell tight junctions, sealing the intercellular cleft, with the transmembranous and structural proteins, which are associated with the endothelial cells as well as the basal lamina of the capillaries, constitute structural and functional components of substantial importance, which regulate and control the transport of molecules across the vascular wa The blood-brain barrier (BBB) is a highly specialized structure formed by a tight monolayer of brain endothelial cells, which maintain bloodstream cells, neurotoxic compounds, and microorganims...Â Thus, the NVU facilitates the cross talk between the CNS and the periphery through the BBB. The BBB is organized to prevent undesirable substances from entering the brain while allowing access to necessary compounds. In consequence of its structure, the BBB is an impediment for drug delivery into the CNS and experimental protocols are being investigated to selectively modulate the BBB for delivery of therapeutic drugs to treat neurological diseases.Â This book may present a greater relevance to understand several important questions in the field of neurosciences. Key words. Bloodâ€brain barrier (BBB) endothelial cells form a barrier that is highly restrictive to passage of solutes between blood and brain. Many BBB transport mechanisms have been described that mediate transcellular movement of solutes across the barrier either into or out of the brain. One class of BBB transporters that is all too often overlooked is that of the ion transporters.Â It acts as a physical and metabolic barrier between the CNS and the peripheral circulation that serves to regulate and protect the microenvironment of the brain.Â More recent research has focused on deciphering the mechanism of BBB dysfunction in the pathogenesis of epilepsy and several studies have suggested the involvement of the inflammatory transforming growth factor $\hat{1}^2$ (TGF- $\hat{1}^2$) pathway. PDF | On Jun 12, 2005, Hazel C Jones published An important reference book for research on barriers between blood and the CNS | Find, read and cite all the research you need on ResearchGate.Â blood and the CNS. Hazel C Jones*1,2. Address: 1Department of Pharmacology, University of Florida, Gainesville, FL 32610, USA and 2Gagle Brook House, Chesterton, Bicester, Oxon. Blood-brain barrier. Not only understanding the neurological diseases progression, but also discovery and development of CNS drugs is a substantial challenge in the neuropharmaceutical industry, due to the persistent difficulty of delivering drug molecules across the BBB [40].Â The CNS requires a perfectly regulated environment and homeostasis with characteristics far different from those in the rest of the organism. The main factor maintaining the homeostasis of the CNS is the proper function of the BBB.Â BMECs form a very thin but very effective barrier between blood and brain parenchyma. Brain micro-vessels are phenotypically unique compared to vessels in the periphery.