Microarrays, Barriers, Analogues and DOPA

Methods in Molecular Medicine 114: Microarrays in Clinical Diagnostics

Edited by *Thomas O. Joos* and *Paolo Fortina.*

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In the past decade, microarray technologies have evolved from a promising research tool to well-established technologies used in laboratories all over the world. Needless to say, the high information content and miniaturization of the microarray format has tremendous potential in diagnostics. Furthermore, the ability to rapidly characterize genetic alterations and proteomic variation opens the door to a more targeted and personalized medicine. *Microarrays in Clinical Diagnostics*, edited by Thomas O. Joos and Paolo Fortina, is a collection of fifteen chapters by authors from both industry and academia, surveying current applications of microarray-based technologies in diagnostics, including universal DNA microarrays, parasite detection/characterization, genotyping SNP, protein and antibody microarrays, as well as the technical aspects of the technology, such as sample preparation, microarray agitation during hybridization, and quality control. While microarray technologies are simple in concept, their practical implementation can be complex. There is a great need for a laboratory manual that gathers the know-how that has been acquired by the practitioners in the field. *Microarrays in Clinical Diagnostics* meets that need and provides protocols in the successful style of the *Methods in Molecular Biology* series, with clarity and sufficient technical detail so that both novice and current microarray users are sure to benefit from this book. It provides detailed protocols for every aspect of the technology, from derivatization of the glass surface and preparation of protein microarrays to validation and quality control of microarray-based analytical methods. Important sample-preparation techniques are also presented, such as noncontact laser microdissection and pressure catapulting to isolate samples of interest homogeneously in an automatable fashion. Importantly, each protocol comes with a list of necessary equipment and reagents as well as tips on troubleshooting problems.

Of course, the widespread use of microarray technologies in diagnostics is still more a vision than a reality, and the use of such technologies must be validated in large-scale clinical studies; however, the first signs of success are clearly here. The first pharmacogenomic microarray has been approved to measure genetic variations for two genes that play a role in the metabolism of about 25% of all prescription drugs; this allows physicians to adjust treatment doses for patients on therapeutics metabolized by these genes. It is also clear that microarray-based technologies will continue to evolve rapidly, and perhaps the biggest limitation of this book is the lack of an adjoining web-site where protocols and relevant information can be kept up to date.

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Blood–Brain Barriers: From Ontogeny to Artificial Interfaces

Edited by *Rolf Dermietzel*, *David C. Spray*, and *Maiken Nedergaard.*

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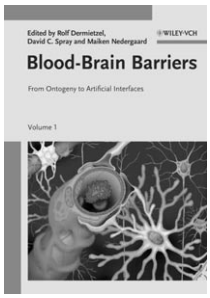
One hundred and twenty years ago, the physician Paul Ehrlich observed that intravenous administration of a dye solution to laboratory animals stained all organs except for the brain. Other researchers confirmed his findings, and in 1921 the physiologist Lina Stern used the term "barrière hématoencéphalique" for the first time. In 1929, H. Foertig wrote the first scientific paper entitled "Die Bluthirnschranke" or "the blood–brain barrier", which was rather provocative at that time. An organ had been discovered that is still the subject of intensive studies, but is still far away from being completely understood.



The blood–brain barrier consists of a tight network of blood capillaries that separate the central nervous system from circulating blood and ensure that no xenobiotics or toxic metabolites disturb the sensitive homeostasis of the brain. In the past decade, the blood brain barrier has been the subject of increasing interest, because it also represents an almost insuperable obstacle to many drugs and drug candidates under development for the treatment of CNS-related diseases such as Parkinson's disease, Alzheimer's disease, infections and brain tumors and metastases.

Now, the team surrounding Rolf Dermietzel, David Spray, and Maiken Nedergaard have undertaken the task of gathering the present knowledge about the blood–brain barrier into a book of two volumes with 740 pages. In seven main sections with 28 chapters, the authors describe the structure and function of cerebral microvessels, as well as possibilities to study and to manipulate them.

The introductory section explains the development and differentiation of the blood–brain barrier and describes the factors of angiogenesis and barrier genesis as well as the impact of microvasculature on neurogenesis. In the second section, the authors deal with the various cell types that contribute to barrier function such as endothelial cells, pericytes, macrophages of the brain, microglia, and astrocytes. Section 3 describes factors of