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Book review

***Arachidonate Remodeling and Inflammation*. Edited by A.N. Fonteh and R.L. Wykle, Bikhäuser Verlag, Basel–Boston–Berlin, 2004 (ISBN 3-7643-6948-5)**

Arachidonic acid ($C_{20:4}$) and other long chain polyunsaturated fatty acids are precursors of important signaling molecules that are crucial in regulating many vital cell functions. Arachidonic acid belongs to essential fatty acids that are not synthesized in mammalian (and human) body but must be taken with food of plant or fish origin. [However, arachidonic acid can be synthesized within mammalian tissues from another essential fatty acid, linoleic acid ($C_{18:2}$)]. In animal tissues, arachidonic acid can redistribute between various glycerolipids, the process that is generally described as its *remodeling*. This process has been recognized as "an important mechanism to regulate the intracellular levels of free and esterified arachidonic acid and to determine the quantities of arachidonic acid that can be mobilized at any time from the storage pools". Understanding of arachidonic acid metabolism, its remodeling and conversion to intracellular mediators may by essential for identification of new therapeutic targets as well as for designing efficient tools for controling and/or prevention of inflammatory diseases. Before forming signaling molecules, arachidonic acid undergoes a series of chemical and enzymatic transformations that, taken together, can also be outlined as remodeling in a broader sense of this term. This book collects eleven overview articles on different pathways of this remodeling and the role of these pathways in regulation of various physiological and pathological processes.

The introductory chapter by A.N. Fonteh, one of the book editors, gives a general outline of the remodeling pathways. Its Fig. 1 presents a comprehensive scheme of the most important transformation reactions, leading from arachidonic acid to its signaling products affecting such processes as cell maturation, proliferation and migration, apoptosis and inflammation.

Phospholipases A_2 are essential for liberation of free arachidonic acid from its "stores" in form of phospholipids. Their roles in inflammatory conditions in phagocytic cells are discussed in the next three chapters. Phospholipases A_2 (PLA_2s) are the main enzymes that hydrolyze the ester bound in the sn-2 position and are therefore involved in the degradation and remodeling of membrane phospholipids. A major attention is focused on the regulation of glycerophospholipid composition by calcium- independent PLA_2 (and in consequence the functioning of inflammatory cells), the enzymatic and receptor-dependent activity of secretory PLA_2 in inflammatory diseases and the controling role of Ca^{2+}-independent PLA_2 in the regulation of arachidonic acid release in activated phagocytic cells.

Arachidonate remodeling in relation to inflammatory processes is the main subject of several subsequent chapters. They deal, in particular, with inflammatory cells of the human lung, inflammatory response in the central nervous system and with the function of neutrophils and platelets. Interestingly, other arachidonate derivatives, lipoxins, exhibit anti-inflammatory activity. They are the subject of a separate chapter that deals with the biosynthesis, function and a promising role in therapy of inflammation, cardiovascular diseases and cancer of this novel class of lipid mediators.

Lipids comprise approximately 50% of brain dry matter. The most metabolically active lipids are polyunsaturated fatty acids, among them arachidonic acid. It has to be, therefore, expected that the metabolism of this compound may be altered under brain damage and, *vice versa*, lipid metabolic disorders may cause brain pathologies. In this context, one of the chapters discusses remodeling of arachidonic acid in Alzheimer's disease. No clear conclusion on the relation between this neurological disorder and arachidonic acid can be, however, made at the present state of our knowledge.

Biosynthesis and physiological function of anandamide (arachidonoylethanolamide) and arachidonoylglycerol, newly recognized lipid mediators, as well as their receptors are the topic of another chapter where they are discussed with a special attention on their function in the nervous system, inflammation and immune response.

Taking together, this collection of articles by experts in the field gives a comprehensive overview of our present knowledge of metabolism and functions of arachidonic acid. Numerous citations of the pertinent literature provide an additional source of information. This book can thus be recommended as a valuable help for biochemists, cell biologists and doctors interested in inflammatory processes, cardiovascular diseases, cancer and other lipid-mediated disorders.

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