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Commentary

Clinical Synapsis in Bioactive Lipids and Lipid Sensing Receptors

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DESCRIPTION

Bioactive lipids are involoved in signalling in every cell of organism by affecting cell function and regulation. Few lipid-derived bioactive molecules, except eicosanoids, had been described. However, studies conducted in the last 15 to 20 years have shown that fatty acids, fatty acid derivatives, and other lipid molecules have a wide range of biological functions. Bioactive lipids come in a wide range of structural forms, from straightforward saturated fatty acids to intricate compounds generated from different omega-3 and omega-6 Polyunsaturated Fatty Acids (PUFA) and sphingosine. The different phospholipases and phospholipid kinases, which are themselves activated by a variety of signal transducing receptors, produce several bioactive lipids as a result of their actions.

Eicosanoids make up the majority of the bioactive lipids in the human body. The oxidation of polyunsaturated fatty acids with 20 carbons results in a broad class of physiologically active unsaturated fatty acids. It controls numerous physiological and pathological processes in the body as a major inflammatory agent that is widely distributed in body fluids and tissues. They belong to a broad class of hormone analogues that are produced by numerous mammalian tissues, and because they only function in the organs where they are produced, they are known as autocrine regulatory molecules.

G-Protein Coupled Receptors (GPRs) are bioactive lipids that are vital for maintaining energy homeostasis, cell growth, metabolism, inflammatory homeostasis, and process regulation. As a result, their activities are exerted through binding to specific receptors. These originate specifically from the GPCRs. It has been discovered that a number of human genome sequences are triggered by free fatty acids and lipid molecules.

Eicosanoids

This significant class of bioactive lipid mediators is known as eicosanoids. Due to the high structure-activity relationship, typical many stereo-centers, double bonds, and overall high bioactivity, these substances require extremely sensitive as well as selective analysis methods. Recently gas chromatography and ultra-high pressure liquid chromatography in tandem with mass spectrometry are the most often utilized techniques.

GPR44

Initially thought to be an orphan GPCR, GPR44 has since been demonstrated to bind to and be triggered by Prostaglandin D2 (PGD2). The gene for the initially discovered GPR44 protein is now known as *PTGDR2*, and it is one of two genes that code for receptors for lipids from the prostaglandin D family. *PTGDR1* is the second gene in this family of prostaglandin D receptors. Both the protein encoded by the *PTGDR1* gene and the protein encoded by the *PTGDR2* genes are known as DP1 and DP2, respectively.

CONCLUSION

Lysophosphatidic Acid (LPA) can promote cell proliferation, and abnormal LPA-signaling has been linked to cancer in several ways. Leukotriene's plays a role in the pathogenesis of asthma, particularly in patients with aspirin-exacerbated respiratory disease. The thrombosis forms in cardiovascular illness because of active cells on bioactive lipids. And by increasing or inhibiting these active lipids, this can aid in the treatment of cardiovascular disorders. These cells can cause tissue injury by releasing proinflammatory and cytotoxic oxidants, cytokines, proteases, and bioactive lipids. More recent research indicates that macrophages and the mediators they produce play a critical role in tissue regeneration and the down regulation of the inflammatory response later on after damage.

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