



# Lipoxins: Anti-inflammatory Mediators Promoting Resolution of Inflammation and Tissue Repair

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## INTRODUCTION

Lipoxins are specialized pro-resolving lipid mediators derived from arachidonic acid through the lipoxygenase pathway. Unlike other eicosanoids that promote inflammation, lipoxins play a pivotal role in resolving inflammation and restoring tissue homeostasis. The primary lipoxins, LXA4 and LXB4, are produced by the coordinated action of 5-lipoxygenase (5-LO) and 15-lipoxygenase (15-LO) enzymes in various cells, including leukocytes and platelets. Lipoxins exert their effects by binding to specific G-protein coupled receptors, such as ALX/FPR2, on target cells, initiating anti-inflammatory and pro-resolving signaling pathways. They inhibit neutrophil chemotaxis and adhesion, reduce the production of pro-inflammatory cytokines, and promote the clearance of apoptotic cells by macrophages, a process known as efferocytosis. By terminating the inflammatory response and promoting tissue repair, lipoxins help prevent chronic inflammation and associated diseases.

## DESCRIPTION

Lipoxins are specialized pro-resolving lipid mediators derived from arachidonic acid through the lipoxygenase pathway. Unlike other eicosanoids that promote inflammation, lipoxins play a crucial role in resolving inflammation and promoting tissue repair. The primary lipoxins, LXA4 and LXB4, are produced by the coordinated action of 5-lipoxygenase (5-LO) and 15-lipoxygenase (15-LO) enzymes in various cells, including leukocytes and platelets. Lipoxins exert their effects by binding to specific G-protein coupled receptors, such as ALX/FPR2, initiating anti-inflammatory and pro-resolving signaling pathways. By terminating the inflammatory response and promoting tissue repair, lipoxins help prevent chronic inflammation and associated diseases. The therapeutic potential of lipoxins and their stable analogs is being explored in various inflammatory and autoimmune conditions, including

arthritis, asthma, and cardiovascular diseases. Understanding the mechanisms by which lipoxins resolve inflammation offers valuable insights into the development of novel anti-inflammatory therapies. They inhibit neutrophil chemotaxis and adhesion, reduce the production of pro-inflammatory cytokines, and promote the clearance of apoptotic cells by macrophages. By terminating the inflammatory response and promoting tissue repair, lipoxins help prevent chronic inflammation and related diseases. The therapeutic potential of lipoxins and their stable analogs is being explored in various inflammatory and autoimmune conditions, including arthritis, asthma, and cardiovascular diseases.

## CONCLUSION

Lipoxins are lipid mediators derived from arachidonic acid, playing a crucial role in resolving inflammation and promoting tissue repair. They inhibit neutrophil chemotaxis and adhesion, reduce pro-inflammatory cytokine production, and promote apoptotic cell clearance. By terminating inflammation and fostering tissue repair, lipoxins help prevent chronic inflammation and related diseases. Their therapeutic potential in inflammatory and autoimmune conditions, such as arthritis, asthma, and cardiovascular diseases, is being explored. Understanding lipoxins' mechanisms in resolving inflammation offers insights into developing novel anti-inflammatory therapies that leverage the body's natural resolution pathways, providing a promising approach to treating chronic inflammatory conditions.

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## CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.

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