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Antimicrobial lipids: Emerging effector molecules of innate host defense

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#### Abstract

The antimicrobial properties of host derived lipids have become increasingly recognized and evidence is mounting that antimicrobial lipids, like antimicrobial peptides, are effector molecules of the innate immune system and are regulated by its conserved pathways. This review, with primary focus on the human body, provides some background on the biochemistry of lipids, summarizes their biological functions, expands on their antimicrobial properties and site-specific composition, presents modes of synergism with antimicrobial peptides, and highlights the more recent reports on the regulation of antimicrobial lipid production as well as bacterial resistance mechanisms. Based on extant data a concept of innate epithelial defense is proposed where epithelial cells, in response to microbial products and proinflammatory cytokines and through activation of conserved innate signaling pathways, increase their lipid uptake and up-regulate transcription of enzymes involved in lipid biosynthesis, and induce transcription of antimicrobial peptides as well as cytokines and chemokines. The

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