

Editorial

Antimicrobial Peptides as Mediators of Innate Immunity

In this special issue of Current Pharmaceutical Design, entitled: “**Antimicrobial peptides as mediators of innate immunity**”, the major features of Antimicrobial Peptides (AMPs) are outlined. In particular, their classification, cellular sources, and biological properties in health and disease are described. Finally, clinical applications of AMPs, as novel therapeutics in the course of infections caused by antibiotic-resistant bacteria, fungi, protozoa and viruses as well as in cancer, are discussed.

Magrone *et al.* [1] at first review the phylogenic sources of AMPs as well as their anti-inflammatory and immunomodulating activities. Moreover, lantibiotics, as new potential anti-infective drugs, are described. Authors also point out the ability of dietary bioactive principles and food supplements to induce AMP production.

Pizzo *et al.* [2] place emphasis on the exploitation of structure, function and mechanisms of action exerted by AMPs in drug targeting. In this review, cryptic AMPs are introduced as proteins hidden in their primary structure and, then, released by the host and/or bacterium proteases. Their discovery has enlarged the spectrum of known AMPs, also allowing investigation of new functions and applications.

Drago-Serrano *et al.* [3] describe the role of Lactoferrin (LF) and lactoferricins (Lfins) in the control of pathogens also in virtue of their immune regulatory properties. LF and Lfins are molecules of pharmacological interest and native LF and its N-terminus peptides seem to have potential applications as adjunctive anti-infectious agents. Finally, these compounds have the property to retard tumor growth and attenuate endotoxin shock.

Chieosilapatham *et al.* [4] review the role played by human cathelicidin LL-37 in the modulation of innate immune response. Particularly, LL-37 exerts pro- and anti-inflammatory activities, also inducing maturation, proliferation and regulation of apoptosis. Finally, according to its anatomical distribution, LL-37 seems to play different roles in the regulation of innate immunity.

Kiatsurayanon *et al.* [5] illustrate the role of human beta-defensins (hBDs) in the maintenance of skin barriers. They exert a broad spectrum of microbicidal activities also displaying several immunoregulatory activities in the course of skin infections and inflammation. A better knowledge of hBD physiology may contribute to develop new therapeutic remedies in the course of skin barrier impairment, such as atopic dermatitis and psoriasis.

Skovbakke *et al.* [6] outline the property of Formyl Peptide Receptors (FPRs) in mediating the immunomodulatory activities of AMPs and peptidomimetics. In this framework, for their function neutrophils express FPRs which behave as targets of AMPs. On these bases, peptidomimetics represent new molecules able to modulate neutrophil activities.

Adolph *et al.* [7] describe the function of intestinal Paneth cells as producers of AMPs finalized to the homeostatic control of microbiota. Emphasis is placed on the alteration of Paneth cell function in inflammatory disease and, especially, in the course of ulcerative colitis and Crohn's disease.

Khurshid *et al.* [8] point out the unique structure of human defensins based on amino acid sequences bearing disulphide bridges which allow their synthesis or natural production with the help of bacteria. In particular, in this review, the role exerted by oral defensins in health and disease is stressed out.

Rivas-Santiago and Torres-Juarez [9] highlight the ability of AMPs to kill mycobacteria both *in vitro* and *in vivo*. Then, AMPs can be used as an adjunctive therapy in the course of human tuberculosis. However, to avoid collateral effects depending on the multiple activities exerted by AMPs, Authors suggest that certain features, such as comorbidity, family history and risk factors in patients with tuberculosis should be taken into consideration prior to AMP therapy start.

Magrone *et al.* [10] emphasize the concept that AMPs in comparison to antibiotics possess a larger spectrum of antimicrobial activities without inducing bacterial resistance. Therefore, their use in different clinical settings, even including septic shock is discussed. Finally, a series of novel compounds derived from AMPs for their potential capacity to reinforce the immune response are illustrated.

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