THE ANTIMICROBIAL PEPTIDES IN MARINE INVERTEBRATES

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Gene-encoded antimicrobial peptides (AMPs) are widespread in nature. In multicellular organisms from the vegetal and animal kingdoms, antimicrobial peptides (AMPs) form a first-line of defence against pathogens. These endogenous molecules are involved in the innate immunity of many species and are playing an essential role in terms of resistance to infection and survival. Depending on their tissue distribution, AMPs insure a systemic or a local protection of the organism against environmental pathogens. In vertebrates and invertebrates, various classes of AMPs have been identified. A large part of the AMPs display hydrophobic and cationic properties, and most of them have a molecular mass below 10 kDa and adopt an amphipathic structure (α-helix, β-sheet, or mixed structure). Interestingly since 20 years, series of novel AMPs have been discovered in invertebrates including molluscs and crustaceans. In spite of the extreme diversity in their primary and secondary structures, all these natural AMPs have the particularity to affect, with identical or complementary activity spectra, a large number of microorganisms. The purpose of this overview, focused on AMPs from invertebrates and more precisely from marine animals, is to outline their structural features and properties and to give the flavour of such promising molecules for aquaculture and therapeutic uses. However, it is important to stress several aspects that have to be considered for the development of AMPs as therapeutic agents (1) their *in vivo* toxicity, (2) their biodisponibility and stability, (3) the acquisition of resistance of the micro-organisms to such peptides, (4) the *in vivo* efficacy compared to the *in vitro* activities, and (5) the cost of the treatments, closely associated with their specific activity in a therapeutic process.