



Analgesic Peptides: From Natural Diversity to Rational Design

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Streszczenie

Pain affects one-third of the global population and is a significant public health issue. The use of opioid drugs, which are the strongest painkillers, is associated with several side effects, such as tolerance, addiction, overdose, and even death. An increasing demand for novel, safer analgesic agents is a driving force for exploring natural sources of bioactive peptides with antinociceptive activity. Since the G protein-coupled receptors (GPCRs) play a crucial role in pain modulation, the discovery of new peptide ligands for GPCRs is a significant challenge for novel drug development. The aim of this review is to present peptides of human and animal origin with antinociceptive potential and to show the possibilities of their modification, as well as the design of novel structures. The study presents the current knowledge on structure-activity relationship in the design of peptide-based biomimetic compounds, the modification strategies directed at increasing the antinociceptive activity, and improvement of metabolic stability and pharmacodynamic profile. The procedures employed in prolonged drug delivery of emerging compounds are also discussed. The work summarizes the conditions leading to the development of potential morphine replacements.

Słowa kluczowe

natural antinociceptive peptides, opioids, analgesia, nociceptin/orphanin, peptidomimetics, bioconjugates

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