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Success stories of natural product-based hybrid molecules for multi-factorial diseases

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Graphical Abstract

Natural product based hybrid molecules for the management of complex diseased conditions

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ABSTRACT:

Complex diseases comprises of highly complicated etiology resulting in limited applicability of conventional targeted therapies. Consequently, conventional medicinal compounds suffer major failure when used for such disease conditions. Additionally, development of multidrug resistance (MDR), adverse drug reactions and clinical specificity of single targeted drug therapy has increased thrust for novel drug therapy. In this rapidly evolving era, natural product based discovery of hybrid molecules or multi-targeted drug therapies have shown promising results and are trending now a days. Historically, nature has blessed human with different sources viz. plant, animal, microbial, marine and ethnopharmaceutical sources which has given a wide variety of medicinally active compounds. These compounds from natural origin are always choice of interest of medicinal chemists because of their minimum side effects. Hybrid molecules synthesized by fusing or conjugating different active molecules obtained from these sources are reported to synergistically block different pathways which contribute in the pathogenesis of complex diseases. This review strives to encompass all natural product derived hybrid molecules which act as multi-targeting agents striking various targets involved in different pathways of complex diseased conditions reported in literature.