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Hymecromone and Its Derivatives as Promising Cytotoxic Agents: A Review

Abstracts

Cancer is continuing to be a leading cause of death and a major concern for the health-care system. Despite the enormous effort to isolate, design, and synthesize new chemotherapeutic agents, the serious side-effects, mounting tumor-resistance, and poor selectivity are still representing substantial challenges to medicinal chemists. In the past few decades, much focus was placed on investigating the anti-cancerous potential of many nature-derived products. One class of such products is coumarin-based compounds that are characterized by their structural diversity and broad pharmacological properties. Of those, hymecromone, which is commonly known as 7-hydroxy-4-methylcoumarin, and its derived products demonstrated promising results in the management of multi-drug cancer resistance, reduction of adverse effects caused by chemotherapeutic drugs, and development of photo-directed cancer therapy. Additionally, many synthetic hymecromone-derived products were shown to possess a diverse antitumor potential making them effective against different cancer types such as leukemia, prostate, lung, breast, and renal. In this work, we reviewed many recently published scientific papers and analyzed their outcomes to highlight the structural characteristics of the hymecromone-derived products that are important in their potential as antitumor agents. Specification of these characteristics may guide the incoming research toward the design and synthesis of novel chemotherapeutic agents with enhanced properties.