Journal of Cellular and Molecular Pharmacology

Lu et al., J Cell Mol Pharmacol 2017, 1:1

Editorial Open Access

Antimetastatic Mechanisms of Bisdioxopiperazine Compound Study, A Gateway to Success

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Received date: August 15, 2017; **Accepted date:** August 20, 2017; **Published date:** August 30, 2017

Abstracts

Neoplasm metastasis is the causality of 90% cancer patient's mortality. Bisdioxopiperazine compounds (Biz compounds) are a series of synthetic agents that are firstly discovered to exhibit antimetastatic efficacy to animal tumor models. In order to completely overcome neoplasm metastasis in clinics, antimetastatic therapeutic study for Biz compounds is of great clinical significance. This editorial highlights these researches from new perspective.

Keywords Bisdioxopiperazine compounds; Probimane; Razoxane; MST-16; Antimetastatic drugs; Neoplasm metastasis; Drug combinations, Drug development

Background

Cancer is one of the deadliest diseases that cause the 7-10 millions deaths annually worldwide [1-2]. Neoplasm metastasis is prime factor for patient's deaths (approximately 90% of cancer mortality). Therapeutic benefits in late-staged or aged cancer patients are especially poor and useless [3-4]. Clinical anticancer drug therapies currently in use are mainly focusing on primary tumor growth rather than specifically targeting pathologic courses of metastases. It nevertheless needs changing mindset into other types of drug targets and personalized cancer therapy in clinics [4-7]. One of them is the revisiting of Biz compound study [8-9].

Inventions of Biz Compounds

Biz compounds are a series of synthetic agents that are firstly discovered to exhibit antimetastatic efficacy to animal tumor model. In order to completely overcome neoplasm metastasis in clinics, antimetastatic therapeutic study for Biz compounds is of great clinical significance. Since Biz compounds are unique agents in their pharmacological mechanisms of action of metastases inhibition and are conservative anticancer and antimetastatic activities between Biz compounds, further medicinal chemistry or pharmacological studies seems indispensable [8-10]. The structural formulae of the major Biz compounds are represented in Figure 1.

Current Discoveries

Biz compounds are the earliest anticancer agents found to especially inhibit spontaneous neoplasm metastases [12-14]. Due to these earliest discoveries on neoplasm metastasis inhibition, Biz compounds are widely noticed for cancer metastasis treatment study. So far, a lot of new anticancer activity and mechanisms of Biz compounds have been found [15-31]. Accordingly, it is proposed that anticancer and antimetastatic mechanisms of Biz compounds can be a medical gateway for completely understanding into neoplasm metastasis pathogenesis and their therapeutics in clinics.

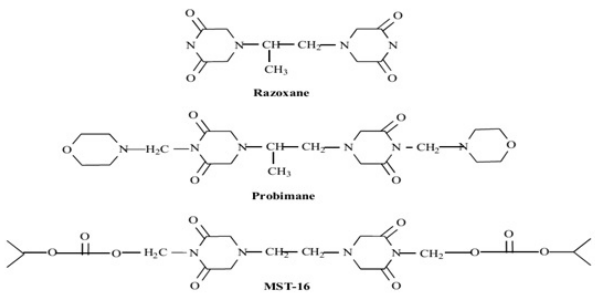

Figure 1: Structural formulae of major bisdioxopiperazine compounds.

Discussion

The major drawback of Biz compounds is low antimetastatic efficacy in clinical trials. Most of past discoveries are come from experimental data. In addition, the debate of high risk of carcinogenesis from Biz compound treatments is difficult to conclude [32-33]. Since there is no definite pathway of anti-metastatic drug developments, we thus suggest that Biz compounds should be carefully studies for both experimental investigations and clinical applications in cancer treatments. Today, we are in front of widely therapeutic failure in cancer metastasis treatments [4-5]. To change this scenario, new generation of pharmacologic/medical researches for Biz compounds, such as personalized cancer treatments [34] are urgently needed.

Summary

In summary, we address and highlight the different inhibitions against metastases in vivo and molecular mechanisms in vitro of Biz

compounds, especially relating to the inhibitions of tumor metastasis including pathways of angiogenesis, topoisomerase II, calmodulin, sialic acid, fibrinogen, cell-movements and so on [12-31]. These kinds of researches might be an avenue for the successes of neoplasm metastasis treatments.

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