Sanguinarine induces apoptosis in A549 human lung cancer cells primarily via cellular glutathione depletion.

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Source

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Abstract

Sanguinarine is a plant-derived benzophenanthridine alkaloid and has been shown to possess anti-tumor activities against various cancer cells. In this study, we investigated whether sanguinarine induces apoptosis in A549 human lung cancer cells. Treatment of A549 cells with sanguinarine induced apoptosis in a dose- and time-dependent manner. Treatment with sanguinarine led to activation of caspases and MAPKs as well as increased MKP-1 expression. Importantly, pretreatment with z-VAD-fmk, a pan caspase inhibitor suppressed the sanguinarine-induced apoptosis in A549 cells. Moreover, pretreatment with NAC, a sulphydryl group-containing reducing agent strongly suppressed the apoptotic response and caspase activation to sanguinarine. However, the sanguinarine-mediated cytotoxicity in A549 cells was not protected by pharmacological inhibition of MAPKs or MKP-1 siRNA-mediated knockdown of MKP-1. These results collectively suggest that sanguinarine induces apoptosis in A549 cells through cellular glutathione depletion and the subsequent caspase activation.

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