Nitidine is a benzophenanthridine alkaloid that exhibits anticancer chemotherapeutic, anti-inflammatory, anti-parasitic, and antifungal properties. In cancer cells, nitidine decreases phosphorylation of Akt and downregulates expression of matrix metalloproteinases 2 and 9 (MMP2/9), inhibiting cellular migration and invasion. In vivo, nitidine inhibits activation of JAK/STAT3, downregulates expression of cyclin D1, cyclin-dependent kinase 4 (CDK4), and Bcl-2, and upregulates expression of p21 and Bax, resulting in decreases in tumor weight and volume. Additionally, nitidine inhibits topoisomerase I and binds to DNA sequences containing alternating G and C base pairs. In macrophages, this compound decreases production of pro-inflammatory cytokines such as TNF-α, IL-1β, and IL-6 and inhibits phosphorylation of MAPK and activation of NF-κB. Nitidine also displays inhibitory activity against species of Plasmodium that are resistant to chloroquine and other antimalarial compounds.

References


