Doxycycline is a tetracycline antibiotic that exhibits anti-parasitic, anti-helminthic, anti-inflammatory, anticancer, and anti-metastatic activities. Doxycycline exerts its antibacterial activity through binding 16S rRNA of the bacterial 30S ribosome, preventing binding of aminoacyl-tRNA to the ribosomal A site, inhibiting translation. Doxycycline also inhibits matrix metalloproteinases (MMPs). Doxycycline displays slow antimalarial benefit, inhibiting expression of the apicoplast genome and inducing loss of function in parasites. This compound inhibits *Wolbachia* endosymbionts from *Wuchereria*, inducing sterilization and inhibiting growth. Doxycycline improves pulmonary function and parameters of chronic obstructive pulmonary syndrome (COPD) in clinical settings. Additionally, doxycycline inhibits migration and proliferation of breast adenocarcinoma cells. Doxycycline also attenuates cardiac hypertrophy in vivo and displays anti-allergic and anti-asthma benefits, suppressing activation of IgE and upregulating expression of IL-2.

References


