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A mini-review on anticancer-related properties of azithromycin and its potential activities in overcoming the challenges of glioblastoma

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Abstract

The resistance, plasticity, and heterogeneity of cancer cells, including glioblastoma (GB) cells, have prompted the investigation of various agents for possible adjuncts and alternatives to existing therapies. This includes a macrolide antibiotic, azithromycin (AZI). It possesses intriguing anticancer properties in a range of cancer models in vitro, such as antiproliferative, pro-apoptotic, anti-autophagy, and anti-angiogenic effects. In fact, AZI is renowned for its ability to eradicate cancer stem cells by inhibiting mitochondrial biogenesis and respiration. AZI-containing regimens in cancer patients for different purposes have shown favourable (i.e., attributed to its antibacterial activity) and unfavourable outcomes. Whilst its direct anticancer effects have yet to be clinically proven. To that end, this review provides a summary of AZI anticancer studies and delineates its potential activities in overcoming the challenges of GB.

Keywords: Azithromycin; anticancer; cytotoxicity; glioblastoma; macrolide antibiotic; mitochondrial-targeted antibiotic.