

Mechanistic understanding of curcumin's therapeutic effects in lung cancer

ABSTRACT

Lung cancer is among the most common cancers with a high mortality rate worldwide. Despite the significant advances in diagnostic and therapeutic approaches, lung cancer prognoses and survival rates remain poor due to late diagnosis, drug resistance, and adverse effects. Therefore, new intervention therapies, such as the use of natural compounds with decreased toxicities, have been considered in lung cancer therapy. Curcumin, a natural occurring polyphenol derived from turmeric (*Curcuma longa*) has been studied extensively in recent years for its therapeutic effects. It has been shown that curcumin demonstrates anti-cancer effects in lung cancer through various mechanisms, including inhibition of cell proliferation, invasion, and metastasis, induction of apoptosis, epigenetic alterations, and regulation of microRNA expression. Several in vitro and in vivo studies have shown that these mechanisms are modulated by multiple molecular targets such as STAT3, EGFR, FOXO3a, TGF- β , eIF2 α , COX-2, Bcl-2, PI3KAkt/mTOR, ROS, Fas/FasL, Cdc42, E-cadherin, MMPs, and adiponectin. In addition, limitations, strategies to overcome curcumin bioavailability, and potential side effects as well as clinical trials were also reviewed.

Keyword: Lung cancer; Curcumin; Anti-cancer; Molecular mechanism