

Bax/Bcl-2 Cascade Is Regulated by the EGFR Pathway: Therapeutic Targeting of Non-Small Cell Lung Cancer

ABSTRACT

Non-small cell lung carcinoma (NSCLC) comprises 80%–85% of lung cancer cases. EGFR is involved in several cancer developments, including NSCLC. The EGFR pathway regulates the Bax/Bcl-2 cascade in NSCLC. Increasing understanding of the molecular mechanisms of fundamental tumor progression has guided the development of numerous antitumor drugs. The development and improvement of rationally planned inhibitors and agents targeting particular cellular and biological pathways in cancer have been signified as a most important paradigm shift in the strategy to treat and manage lung cancer. Newer approaches and novel chemotherapeutic agents are required to accompany present cancer therapies for improving efficiency. Using natural products as a drug with an effective delivery system may benefit therapeutics. Naturally originated compounds such as phytochemicals provide crucial sources for novel agents/drugs and resources for tumor therapy. Applying the small-molecule inhibitors (SMIs)/phytochemicals has led to potent preclinical discoveries in various human tumor preclinical models, including lung cancer. In this review, we summarize recent information on the molecular mechanisms of the Bax/Bcl-2 cascade and EGFR pathway in NSCLC and target them for therapeutic implications. We further described the therapeutic potential of Bax/Bcl-2/EGFR SMIs, mainly those with more potent and selectivity, including gefitinib, EGCG, ABT-737, thymoquinone, quercetin, and venetoclax. In addition, we explained the targeting EGFR pathway and ongoing in vitro and in vivo and clinical investigations in NSCLC. Exploration of such inhibitors facilitates the future treatment and management of NSCLC.