

Role of Adenosine receptor in lung cancer

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Summary

Adenosine through adenosine receptor have a crucial role in biology of lung cancer. Recent study indicated adenosine receptors have a crucial role in various aspect of lung cancer from cell growth and metastasis to modulation of apoptosis and it could be considered as a potential candidate for treatment of the lung cancer.

Keywords: Adenosine receptors, Lung cancer

Statement

Lung cancer is a major cause of cancer deaths worldwide with 18.4% of total cancer cases and also the most common cancer diagnosis with 11.6% of total cancer cases (1). Despite progress in cancer therapy, treatment of lung cancer has not been very successful (2). Current attempts have focused on target therapy in lung cancer with the design of

drugs that block the activities of the key pathways in lung cancer (3). In recent years, adenosine signaling has emerged as a pivotal signaling pathways in different human malignant diseases (4). Because adenosine metabolism changes in lung disease, it is support critical role of adenosine in pathogenesis of lung disease (5). Adenosine initiates its cellular signaling pathways through four G protein receptors, A1, A2A,

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A2B and A3. The A1 and A3 adenosine receptors (AR) are coupled to Gi/o proteins and inhibit cyclic AMP production, while A2AAR and A2BAR are coupled to Gs/olf proteins and stimulate cyclic AMP production (5). High expression of adenosine receptors reported in lung cancer taking role in pathogenesis of lung cancers (6,7). It has been shown that adenosine receptors regulates survival in lung cancer cells (6,7). Inhibition of A2AAR inhibits tumor cell growth with induction of apoptosis in lung cancer (6). It was reported adenosine and the agonist A3AR induces apoptosis in lung cancer (7). A number of study have shown crucial role adenosine receptors, especially A2BAR in lung metastasis (8-10). A2BAR regulate epithelial-mesenchymal transition in lung cancer process has been widely associated with metastasis (8). Moreover, blockade of A2BAR inhibited lung metastasis in immunodeficient mice after implantation of breast cancer cells (9). It has also been reported that inhibition of A2B AR, promote the efficacy of radiotherapy (10). Furthermore, a study indicated the expression of the A2B AR as opposite prognostic biomarker in patient with lung cancer (11). Considering the above-mentioned explanations targeting adenosine receptors have the potential regulation of survival and metastasis of lung cancer cells and can be considered as drug targets for the treatment of lung cancer.

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