



Baicalin Induces Apoptosis and Suppresses the Cell Cycle Progression of Lung Cancer Cells Through Downregulating Akt/mTOR Signaling Pathway

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Baicalin, as a natural active ingredient extracted and isolated from the traditional Chinese medicine *Scutellaria baicalensis* Georgi., has been potentially used in various areas for its antioxidative, antitumor, anti-inflammatory, and anti-proliferative activities. Although several studies have reported the antitumor effects of baicalin against various cancer types, its beneficial effects on lung cancer have not yet been elucidated. Therefore, the therapeutic effects and molecular mechanisms of baicalin on lung cancer cell lines H1299 and H1650 were investigated. Here, the results of its antitumor activity were shown. We found that Akt/mTOR pathway inhibition was the essential determinant in baicalin-induced cell cycle arrest. Furthermore, when the Akt Agonist SC79 or Akt plasmid transfection was performed, the antitumor effect of baicalin was significantly abrogated in both H1299 and H1650 cells. In conclusion, we found that baicalin exerted its antitumor activity mainly by inducing Akt-dependent cell cycle arrest and promoting apoptosis, which show great potential for developing a new drug for lung cancer treatment.

Keywords: baicalin, cell cycle, apoptosis, lung cancer, Akt

INTRODUCTION

Lung cancer is still one of the most fatal cancers in the world (Bray et al., 2018). Surgery, chemotherapy, radiotherapy, and molecular target therapy are major treatment options for lung cancer patients (Fiero et al., 2019). Despite recent advances in new antitumor agents and intensity-modulated radiation therapy, the side effects and toxicity of these strategies have produced a bottleneck in clinical lung cancer treatments (Hellmann et al., 2019; Crunkhorn, 2020). Therefore, there is an urgent need to discover alternative reagents or novel therapeutic approaches for lung cancer patients.