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DSC2 Promotes the Proliferation, Metastasis and Drug Resistance of Lung Cancer by Activating the PI3K/AKT Pathway

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Abstract : Objective: The aim of this study was to investigate the role of desmocollin 2 (DSC2) protein in the proliferation, migration and drug resistance of lung cancer cells. Method: CCK-8 assays and colony formation assays were used to evaluate the effect of dsc2 regulation on cancer cell viability and colony formation. Transwell assays and wound healing assays were also performed. Cell flow double staining was used to detect the apoptosis rate of cells with DSC2, which was added cisplatin. Western blot assay was used to detect cell cycle, PI3k/Akt and apoptosis-related proteins. Results: Our data showed that dsc2 is upregulated in clinical lung cancer tissues compared with pericarcinomatous tissues, and it is differentially expressed in lung cancer cell lines. The down-regulation of dsc2 in A549 and H358 lung cancer cells significantly suppressed the cell proliferation, metastasis, and motility. In contrast, the opposite effects were observed in overexpression of dsc2 both in H23 and PC9 cell lines. In addition to lung adenocarcinoma cell lines, we also examined its expression in lung squamous cell lines, such as H226. Western blotting showed that dsc2 could reduce the level of phosphorylated Akt (Ser 473) and p-mTOR. Thus, it is speculated that dsc2 up-regulation promotes proliferation and invasiveness through activation of the PI3K/AKT pathway. Also, knockdown of dsc2 in A549 and H226 could significantly decreased in the levels of cyclinB and wee1 protein. Additionally, flow cytometry showed that dsc2 knockdown combined with cisplatin could significantly enhance cell apoptosis rate. Conclusion: These data suggest that dsc2 promotes the proliferation and migration of lung cancer cells in vitro. Also, the results suggested that dsc2 could affect the cell cycle and apoptosis of lung cells. Furthermore, knockdown of dsc2 could sensitize cisplatin in both lung adenocarcinoma and lung squamous cell lines. Thus we suggested that dsc2 can be used as a therapeutic target for lung cancer.

Keywords : desmocollin 2, cisplatin, lung cancer, PI3K/AKT, lung squamous cell
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