Human bronchial epithelial cells as a good control for evaluation potential therapeutic Notch signaling in non-small cell lung cancer

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ABSTRACT

Purpose: Notch signaling is often deregulated in non-small cell lung cancer (NSCLC), but little is known about the initial endogenous mRNA status of Notch ligands and receptors. Therefore, the aim of this study was to evaluate expression level of NOTCH1 receptor and Notch ligands, such as delta like ligands (DLL1, DLL3, DLL4), and jagged ligands (JAG1, JAG2), as well as target gene-hes family bHLH transcription factor 1 (HES1) in diverse NSCLC cell lines.

Materials and Methods: We have investigated the mRNA expression of chosen genes by using quantitative real time method (RT-PCR). We compared the results from NSCLC cells with results obtained in non-cancerous human bronchial epithelial cells (HBEpC). We also measured NOTCH1 expression in A549 cells, before and after treatment with γ-secretase inhibitor (GSI).

Results: The expression level of NOTCH1, HES1, JAG1 and JAG2 was downregulated when compared to HBEpC. The expression of Notch ligand DLL1 was lower in all cancer cell lines, but mRNA level of DLL3 was elevated in H1299 and A549 cells when related to HBEpC. The mRNA level of DLL4 was higher in H520 and in A549 cell lines. Moreover, the mRNA level of NOTCH1 dropped down after GSI treatment, in addition A549 cells proliferated slower after drug implementation.

Conclusions: We conclude that non-cancerous HBEpC cells could serve as a good control for Notch mRNAs expression analysis in NSCLC. Moreover, GSI-treated cells could inhibit proliferation through suppressing NOTCH1 in A549 cells.

Keywords: Notch, NSCLC, HBEpC

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