Histamine receptor antagonists inhibited proton regulators in oral cancer cell lines Introduction

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Tumor cells including oral squamous epithelial cells are reported to express histamine receptors . Clinical studies suggested that in combination with anti-cancer drugs, histamine type 2 receptor antagonists (H2R ant) and omeprazole could become more sensitive to anti-cancer drug treatment. Furthermore, cancer associated microenvironments (TMEs) play pivotal roles in cancer proliferation and drug resistance. Therefore, we investigated the effects of histamine and anti-histamine drugs on proton secretion molecules in the TME.

Methods

Human oral squamous cancer cell line was treated with histamine for 24 hours or with histamine antagonists for 8 hours followed by the evaluation of gene expressions on proton excretion molecules determined by quantitative PCR.

Results

Among proton excretion molecules, ATP6V1G1, SLC4A1 and SLC4A9 were significantly increased after stimulation with histamine. Histamine receptor H1 through H4 antagonists significantly inhibited gene expressions of ATP6V1G1, SLC4A1 and SLC4A9. ATP 6V1G1 gene expressions were significantly inhibited by histamine receptor 2 antagonist.

Conclusion

Histamine could activate proton secretion molecules. Histamine H2R antagonist could inhibit gene expression of proton secretion molecules. The current study suggested histamine is involved in regulation of TMEs.