Regulation of epidermal growth factor receptor of cultured lung epithelial cells by interleukin-1β

Hideyuki Yamamoto[1], Izumi Nakayama[1,2], Sayomi Higa-Nakamine[1]

[1]Dept. Biochem. Univ. Ryukyus, [2]ICU, Chubu Hosp

A549 cells are an immortalized alveolar epithelial cell line, which has been employed to investigate alveolar epithelial cell responses to several treatments. In the present study, we found that treatment of A549 cells with interleukin 1 beta (IL-1β) induced the activation of p38 mitogen-activated protein kinase (MAP kinase) and MAP kinase-activated protein kinase-2 (MAPKAPK-2), and the phosphorylation of epidermal growth factor receptor (EGFR) at serine 1047. The activation of MAPKAPK-2 and phosphorylation of EGFR were inhibited by SB203580, an inhibitor of p38 MAP kinase. In addition, MK2a inhibitor, an inhibitor of MAPKAPK-2, inhibited the phosphorylation of EGFR. Biotinylation of cell surface proteins indicated that IL-1β treatment induced the internalization of EGFR. Furthermore, the long-term treatment of A549 cells with IL-1β changed the cell morphology, with the loss of cell-cell contacts. In addition, IL-1β augmented the effects of transforming growth factor beta 1 on changes in the epithelial-mesenchymal transition. These results suggested that IL-1β regulates the functions of EGFR and induces morphological changes in alveolar epithelial cells.