Abstract

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Title of the diploma thesis: Influence of TNF-α on hENaC subunits expression

The human amiloride-sensitive epithelial sodium channel (hENaC) is a type of ion channel which has the ability to control salt and water homeostasis. Therefore it is one of the main driving forces for the reabsorption of water through the alveolar epithelium. A dysfunction of this channel, respectively of this control mechanism, leads to a very severe disease – pulmonary edema and several other pathological conditions.

Previous studies tested a drug called AP301, recently named solnatide. AP301 is a cyclic protein comprising the human tumour necrosis factor lectin-like domain sequence. This drug was recently developed as a potential treatment of pulmonary edema. The principle is that it activates hENaC by increasing the open probability. It was also shown that AP301 transiently increases the expression of hENaC subunits in mammalian cells.

In this study we used the Western blot method to test the influence of tumour necrosis factor α (TNF-α) on hENaC subunits expression and we compared these results with the results from the studies with AP301.

We found that TNF-α transiently significantly increased the expression of δ subunit and it had a potential to increase the expression of α subunit. On the other hand, the expression of β- and γ-hENaC was not significantly increased.

Taken together, these results are analogical to those which were found in the studies with AP301.