

## An inactivated *Pseudomonas aeruginosa* vaccine restores imbalanced airway immunity

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**Objectives:** Previously, we observed that an inactivated *Pseudomonas aeruginosa* vaccine (PPA) which was obtained by transfection with the adhesion portion of type 1 fimbria of avian pathogenic *E. coli* inhibited airway allergic inflammation by bronchial administration in an OVA-induced airway hyperresponsiveness animal model. To investigate the underlying mechanism involved, we studied the effects of PPA on epithelial functions in present studies by OVA stress or RSV infection.

**Methods:** Flow cytometry was used to observe the effects of PPA on cell proliferation of BECs and BECs-driven subsets' differentiation of CD4+T cells. Real-time PCR was used to test the expressions of toll like receptor 4 and 5, two recognized asthmatic therapeutic targets IL-17A/Th2 signal molecules Act1 and NF-kB negative regulator A20 in BECs.

**Results:** PPA can promote cell proliferation and toll like receptor-4 and 5 expressions of normal, OVA-stressed and RSV-infected BECs. PPA inhibited Th2 and Th17 differentiation and stimulated Th1 differentiation induced by OVA or RSV. PPA significantly decreased Act1 expression induced by OVA and increased Act1 expression in BECs inhibited by RSV infection. PPA significantly increased A20 expression in BECs inhibited by OVA or RSV.

**Conclusions:** Our data suggest that the therapeutic mechanism of PPA is partly to promote bronchial proliferation and shift bronchial immunity from a Th2 and Th17 to a Th1 bias.

**Keywords:** *Pseudomonas aeruginosa*, toll like receptors, RSV, CD4+T cells.

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