

Immunomodulator for asthma treatment (L-11894)

Highlights

Asthma is a significant public health problem that affects millions of people globally, including about 10% of Canadians. Caused by an unbalanced immune response, its symptoms include tightening of the airway muscles, excess mucus production, and airway eosinophilia and associated pathology. Current medications treat only the symptoms, and can generate serious side effects when used long-term.

To address the need for a safe, disease-modifying treatment, the NRC has developed an immunomodulator that suppresses the unbalanced immune response that causes asthma.

Technology transfer

- › Commercial exploitation licence
- › R&D agreement for development

Market applications

- › Treatment of ongoing asthma
- › Prevention of asthma at onset

How it works

In a mouse model of asthma, NRC scientists showed that intranasal administration of the live vaccine strain of *Francisella tularensis* or its cell-free sonicate extract (CFSE) was able to prevent the development of and suppress ongoing airway eosinophilia and pulmonary pathology (Figure 1).

To better understand how the CFSE suppresses asthma's unbalanced immune response, our experts separated several protein subfractions from

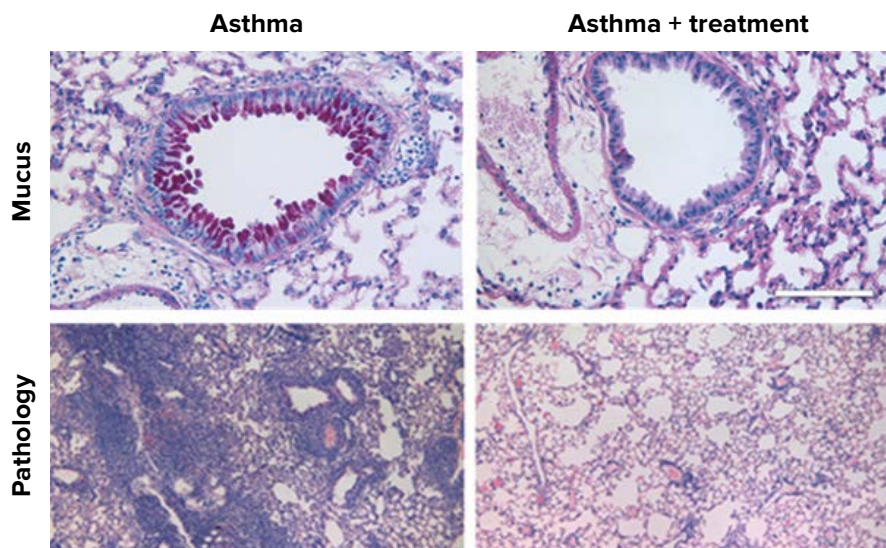


Figure 1: Lung sections showing the effect of treatment with *F. tularensis* LVS or its CFSE on the reduction of mucus production and lung eosinophilia and pathology (right panel) during an ongoing asthma response, as compared to untreated asthmatic lung (left panel).

the CFSE for efficacy testing and proteomics profiling. We found that the protein components induce a T-helper cell (Th1)-mediated response, which suppresses the ongoing pathological T-helper cell (Th2) immune response (mRNA expression and protein levels of cytokines IL-5 and IL-13 in the lungs) responsible for the disease. Suppression of Th2 is effectively modulated without undue side effects.

Benefits

- › Treats the cause (immune imbalance) rather than the symptoms
- › Effective for both the onset of and ongoing airway allergic diseases
- › Non-allergen specific: do not need to know the disease-causing allergen

- › No long term side effects, unlike other asthma medications

Patents

NRC file 11894: Patent issued in the United States, pending in Canada, Europe, and India.

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