

# Expression of CCSP and SPLUNC1, Putative Anti-Inflammatory Proteins, Following Murine Respiratory Viral Infection in vivo

Gail Leeming, James P. Stewart, David J. Hughes, Lynne Bingle, Colin Bingle, and Anja Kipar

The University of Liverpool, Liverpool, UK

**Introduction:** Short palate lung and nasal epithelium clone 1 (SPLUNC1)/BPI fold-containing protein A1 (BPIFA1) and Clara cell secretory protein (CCSP) are expressed by respiratory epithelial cells; SPLUNC1 is expressed predominantly in the upper respiratory tract and CCSP is expressed by Clara cells, which are more numerous within bronchioles. Both proteins are thought to have an anti-inflammatory role.

**Materials and Methods:** We examined the expression of both proteins in respiratory viral infections of MHV-68 infected wood mice (*Apodemus sylvaticus*) and BALB/c mice infected with respiratory syncytial virus (RSV), Sendai virus and influenza A virus.

**Results:** After MHV-68 infection, a decrease in the bronchiolar expression of both CCSP and SPLUNC1 was seen at 7 days post infection (dpi), but by 14 dpi both proteins were up-regulated. RSV did not induce remarkable differences in expression of CCSP. Conversely, mice infected with Sendai and influenza A viruses showed a decrease at 7 dpi, notably in bronchioles with peribronchiolar inflammation. There were minimal alterations in SPLUNC1 expression.

**Conclusions:** Our results provide evidence that both proteins, but in particular CCSP, play a role in the respiratory response to injury and are down-regulated during an inflammatory response.

