

Lung alert

Cardiolipin levels may be a factor in lung injury in pneumonia

This study investigated the role of cardiolipin in experimental pneumonitis in mice. Individuals with progressive familial intrahepatic cholestasis type 1 have a mutation in ATP8b1 and are more prone to bacterial infections. The authors of this study hypothesised that this may be related to cardiolipin and that ATP8b1 may be a transport protein for cardiolipin.

Tracheal aspirates from critically ill patients were analysed and individuals with pneumonia were found to have higher levels of cardiolipin. Levels are normally low in pulmonary lavage fluid. Using mice with a mutation in ATP8b1 against controls they went on to assess this further by infecting the mice with *Escherichia coli* or *Haemophilus influenzae* bacteria.

The authors found that the infected mice had significantly raised levels of cardiolipin, more so if they were ATP8b1 deficient. The raised cardiolipin levels were associated with lung damage thought to be due to impaired surfactant function resulting in high surface tension pulmonary oedema. The authors went on to show that ATP8b1 appeared to be a cardiolipin transport protein; if ATP8b1 is impaired, then cardiolipin is not transported internally in lung epithelia. *H influenzae* also negatively affects ATP8b1. Addition of a peptide containing the ATP8b1 cardiolipin binding domain reduced the cardiolipin levels in mice with a mutation in this area, and subsequently the degree of lung damage.

This study highlights areas for future study of non-microbial therapies for severe pneumonia.

► **Ray NB**, Durairaj L, Chen BB, *et al*. Dynamic regulation of cardiolipin by the lipid pump Atp8b1 determines the severity of lung injury in experimental pneumonia. *Nat Med* 2010;**16**:1120–7.

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