

ACE2 Expression is elevated in airway epithelial cells from aged and male donors *but* reduced in asthma



COVID-19 and acute pneumonitis



Virus binds to ACE2
What factors affect ACE2 expression in lower airways in chronic lung disease?

Increased ACE2 in lower airways cells may increase risk of pneumonia?



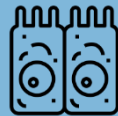
Lower airway samples



2 Australian Cohorts:

- Newcastle, NSW n=115 (enriched asthma and COPD)
- Perth, WA, n=30 (children & adults)

ACE2 mRNA and protein



Cultured bronchial airway cells

Endobronchial biopsies



Outcomes In all people

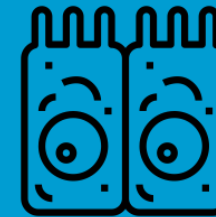
Increased ACE2 receptor independently associated



with **age** and **male sex**



Outcomes in Asthma



- Reduced ACE2 expression
 - mRNA and protein
 - Compared to healthy & COPD
- No difference in TMPRSS2
- Reduced Furin expression
 - assists virus endocytosis
- Increased ADAM-17
 - ability to cleave ACE2 from cell surface

Conclusions

- Host gene expression regulating SARS CoV2 viral entry in human airway epithelial cells is correlated with the key susceptibility factors for COVID-19: Age and male sex.
- Lower ACE2 expression in asthma may be:
 - a feature of chronic type 2 airway inflammation?
 - a consequence of inhaled corticosteroids?