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Anatomical implication of covid 19 on the respiratory system :

The virus moves down your respiratory tract. That's the airway that includes your mouth, nose, throat, and lungs. So COVID-19 is more likely to go deeper than viruses like the common cold.

Your lungs might become inflamed, making it tough for you to breathe. This can lead to pneumonia, an infection of the tiny air sacs (called alveoli) inside your lungs where your blood exchanges oxygen and carbon dioxide.

Human corona viruses are large RNA viruses that infect the human respiratory tract. . Tracheobronchial cultures recapitulate the primary entry point of human respiratory viruses while the alveolar model allows for elucidation of mechanisms involved in viral infection and pathogenesis in the alveoli. These organotypic human airway cultures represent a universal platform to study respiratory virus-host interaction by offering more detailed insights compared to cell lines. Additionally, the epidemic potential of this virus family highlights the need for both vaccines and antivirals. No commercial vaccine is available but various effective antivirals have been identified, some with potential for human treatment. These morphological airway cultures are also well suited for the identification of antivirals, evaluation of compound toxicity and viral inhibition. Tracheobronchial cells are one of the first targets of human respiratory viruses and can be cultured in air-liquid interface where the apical side of the cell layer is exposed to air while the basolateral side is submerged in medium. Tracheobronchial cells cultured in that way form a pseudostratified epithelial layer that both morphologically and functionally resembles the human upper conducting airway. After differentiation, these cultures contain many different cell types such as basal, ciliated and goblet cells. They also produce protective mucus, much like in vivo epithelium. When compared to primary bronchial cells in submerged two-dimensional culture, the gene expression of primary cultures differs significantly. However, the expression pattern of primary human bronchial cultures is comparable to that of in vivo epithelium. The human bronchial cell line has been used as a culture model for respiratory epithelium but its gene expression in cultures is more similar to submerged bronchial cell the primary tracheobronchial culture model is especially fitting for human respiratory virus research since it accurately recapitulates the primary entry point for these viruses. By using these cultures, virus replication and host interactions can be studied in natural target cells. Further establishing the usefulness of this system was propagated for the first time in ciliated cells of bronchial cultures after culturing it in conventional cell lines had failed cultures than differentiated epithelium. Alveolar epithelial cultures can also be used for virus-host interaction studies and are especially applicable when a viral infection causes pneumonia and alveolar damage.

The human bronchial cell line Calu-3 has been used as a culture model for respiratory epithelium but its gene expression in ALI cultures is more similar to submerged bronchial cell cultures than differentiated epithelium