ThinCert™ Cell Culture Inserts as a Useful Tool for COVID-19 Research

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SARS-CoV-2 receptor ACE2 and TMPRSS2 are primarily expressed in bronchial transient secretory cells

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In the following, we provide insight into this publication and summarize the most important results and their implications.

CONTEXT

Coronavirus infections caused by SARS-CoV (2002/2003), MERS-CoV (since 2012) and SARS-CoV-2 (currently) have severely affected global health in the 21st century. Although being closely related, these three viruses differ in their contagiousness – SARS-CoV-2 shows by far the highest human-to-human transmission. Consequently, global research focuses on mechanisms underlaying the human SARS-Cov-2 infection and pathways the virus uses to enter the human body.

SUMMARY OF STUDY RESULTS

In this study, the authors utilize ThinCert™ permeable supports to cultivate bronchial cells at the air liquid interface and subsequently characterize their transcriptome. From their experimental results the authors could conclude that mainly a transient secretory cell type seems to be targeted by the SARS-CoV-2 virus. Furthermore, the authors could presume that the specific gene expression patterns of these cells including the expression of TMPRSS2, ACE2 and genes of RHO GTPase pathways are important factors for their increased vulnerability to SARS-CoV-2.

CONCLUSION AND RELEVANCE

This study provides a rich resource for future research on the COVID-19 pathogenesis and emphasizes the advantage of utilizing in vitro tissue models in addition to real lung tissue. Permeable membrane supports such as ThinCert™ cell culture inserts are the first-choice if organotypic, tissue-like cell culture conditions are required. The opportunity to cultivate cells at the air-liquid-interface qualifies these devices for the generation of fully differentiated airway-epithelia in vitro and their application in COVID-19 research.

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