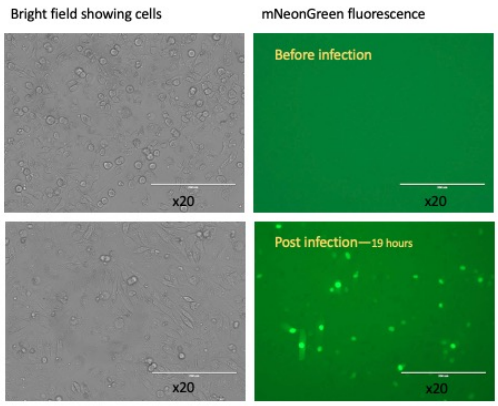
Allele Biotechnology's iPSC-Derived Lung Epithelial Cells Work Wonders in Assaying SARS-CoV-2 Viral Infection and Block

These cells closely mimic in vivo viral targets, potentially express not only the receptor ACE2, but also co-receptors not expressed in HEK293 or Vero E6 cells.



CoV-2 S1-Pseudotyped Virus Carrying a Nuclear mNeonGreen Reporter Assayed with Allele Biotech's iPSC-Derived Lung Epithelial Cells

SAN DIEGO, CA, USA, October 12, 2020 /EINPresswire.com/ -- Using pseudotyped viruses to infect target cells is an important assay in developing neutralizing antibodies as well as in testing immunity post vaccination against coronavirus. Allele Biotech demonstrated how human induced pluripotent stem cell (iPSC)-derived lung epithelial cells, the same type of cells that the COVID-19 virus naturally infects in people, can provide an ideal target in such assays.

Virtually all published data of in vitro viral infection use artificially cultured cells: originally derived from monkey or human fetal tissues isolated many years ago that underwent a "transgenic" process to insert the SARS-CoV-2 receptor gene ACE2, which these cells do not naturally express. The Allele team was not impressed by the efficiency of these current assays using the cells supplied from the most widely used sources including the government-managed repositories.

Utilizing their strength in generating highly potent iPSCs, which are created from tiny adult skin punch biopsies and can be made into any human cell type, scientists at Allele Biotech have used previously developed protocols to generate multiple subtypes of adult human lung tissues; this week, they were tested for SARS-CoV-2 infection. Using mNeonGreen S1-pseudotyped viruses, Allele's iPSC-derived primary-like lung cells showed a several-fold higher infection rate in less than a day post-infection, as quantified by fluorescence (see figure), when compared to other commonly used cells.

Additionally, these cells closely mimic in vivo viral targets, therefore, should express not only the receptor ACE2, but also co-receptors not expressed in artificially cultured cells. As Allele has built a facility to grow iPSCs as an unlimited supply, this new assay can be scaled to support many ongoing COVID-19 programs. Lung cells derived from iPSCs made from different person's biopsy can even provide personalized testing, and opportunities to understand the effects of different patients' genetic background in lung responses to the viral infection. Together, these cells will be extremely useful in assessing neutralizing antibodies and other anti-virus drugs.

Next, Allele researchers have already begun testing the neutralizing effects of their anti-S1 protein (the landing pad for SARS infection) nanoantibodies they recently developed from llamas and look for the best cocktail combinations and the most effective delivery route in stopping the COVID-19 pandemic.

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