

An *in vitro* COVID-19 causing virus culture model: Assessment of SARS-CoV-2 infectivity in Vero E6 cell

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ABSTRACT

Introduction: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) a virus from the Coronaviridae family that causes the Coronavirus disease (COVID-19), has emerged and spread since December 2019. Since then, many *in vitro* and *in vivo* models for COVID-19 research has been developed. **Objective:** This study aimed to determine infectivity rate of various SARS-CoV-2 strains in the Vero E6 cell line. **Materials and methods:** Four SARS-CoV-2 strains (Wuhan, Alpha, Beta, and Delta) were isolated from clinical samples. Virus titre concentration of all strains were measured using Tissue Culture Infectious Dose (TCID₅₀) assay and Plaque assay. At similar virus titre concentration, all strains were incubated in the Vero E6 cells at 37°C for 72 hours. At the end of incubation period, all virus cultures were terminated and analysed using TCID₅₀ assay. **Results and conclusion:** It was found that the Wuhan strain has the highest infectivity rate (3601 PFU/mL/72hours) towards the Vero E6 cells, followed by Alpha (2946 PFU/mL/72hours), Beta (1780 PFU/mL/72hours) and Delta (571 PFU/mL/72hours). Vero E6 cell is commonly used for virus isolation and propagation, however this cell does not mimic the primary entry sites in the human respiratory track. The successful isolation and culture of SARS-CoV-2 in the Vero E6 cell is multifactorial, with high viral titre in source clinical samples and low passage number of cell culture as key factors. Vero E6 cell is susceptible towards all SARS-CoV-2 strains and can be used as *in vitro* COVID-19 culture model. Further studies can be conducted to determine the influence of different cell lines on the COVID-19 infectivity.