

Inhibition of SARS-CoV-2 and SARS-CoV spike pseudotyped virus infection by anti-ACE2 blocking antibody

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BACKGROUND

An outbreak of coronavirus pneumonia disease 2019 (COVID-19) caused by SARS-CoV-2 has widely spread the world. It already caused over 30 million people infection and over 1 million death throughout the world by the Oct, 2020. There is no effective antiviral treatments or vaccines for SARS-CoV-2, and this pandemic not only causes an enormous burden to public health but also markedly affects the global economy.

OBJECTIVE

As ACE2 was identified as the receptor for SARS-CoV-2 and SARS-CoV, this study is aimed to target ACE2 and produce a ACE2 blocking antibody which may be able to prevent both SARS-CoV-2 and SARS-CoV binding to ACE2, thereby inhibit the virus infection of the cells.

RESULTS

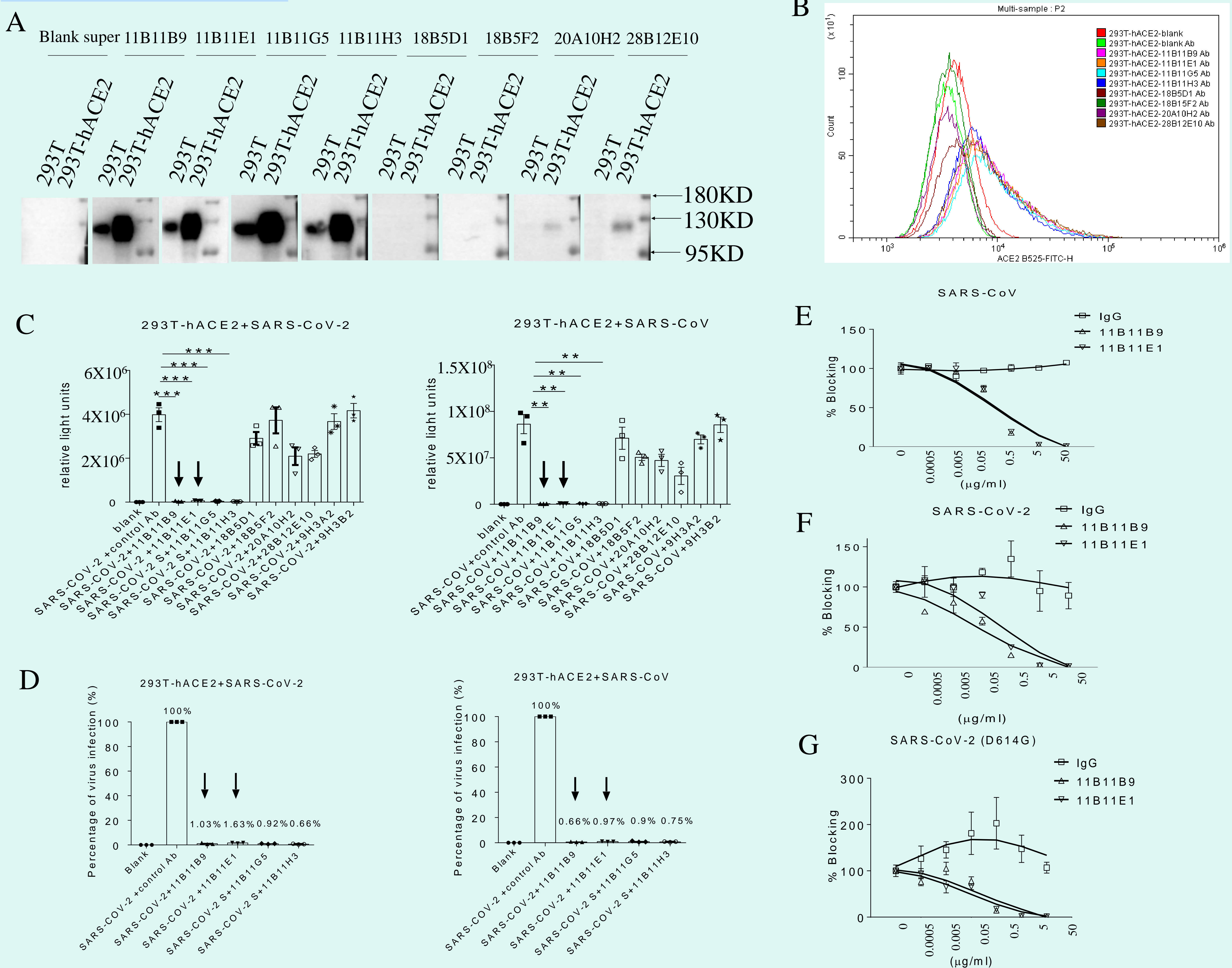


Figure 1. Western blot(A) and flow(B) screening monoclonal antibody that can recognize ACE2. C. Screening of ACE2 mAb that can block SARS-CoV-2 and SARS-CoV pseudovirions from entering cells. 293T-ACE2 cells were inoculated with SARS-CoV-2, SARS-CoV pseudovirions and anti-ACE2 mAb. At 48 h post inoculation, transduction efficiency was measured according to luciferase activities. D. The infection inhibition rate of these four clones(11B11B1, 11B11E1, 11B11G5, 11B11H3) for SARS-CoV-2 or SARS-CoV pseudotyped virus. E-G. Antibody-mediated blocking of infection with SARS-CoV, SARS-CoV-2 and SARS-CoV-2 (D614G) pseudovirions.

CONCLUSION

In the present study, we produce and select one monoclonal human ACE2 blocking antibody, which effectively inhibits SARS-CoV-2 or SARS-CoV spike pseudotyped virus infection. This monoclonal ACE2 antibody may offer potential for prevention and treatment of COVID-19.