

Inhibition of virus entry. SARS-CoV-2 uses ACE2 as the receptor and human proteases as entry activators; subsequently it fuses the viral membrane with the cell membrane and achieves invasion. Thus, drugs that interfere with entry may be a potential treatment for COVID-19. Umifenovir (Arbidol) is a drug approved in Russia and China for the treatment of influenza and other respiratory viral infections. It can target the interaction between the S protein and ACE2 and inhibit membrane fusion (FIG. 5). In vitro experiments showed that it has activity against SARS-CoV-2, and current clinical data revealed it may be more effective than lopinavir and ritonavir in treating COVID-19 (REFS ^{122,123}). However, other clinical studies showed umifenovir might not improve the prognosis of or accelerate SARS-CoV-2 clearance in patients with mild to moderate COVID-19 (REFS ^{124,125}). Yet some ongoing clinical trials are evaluating its efficacy for COVID-19 treatment. Camostat mesylate is approved in Japan for the treatment of pancreatitis and postoperative reflux esophagitis. Previous studies showed that it can prevent SARS-CoV from entering cells by blocking TMPRSS2 activity and protect mice from lethal infections with SARS-CoV in a pathogenic mouse model (wild-type mice infected with a mouse-adapted SARS-CoV strain)^{126,127}. Recently, a study revealed that camostat mesylate blocks the entry of SARS-CoV-2 into human lungs cells⁴⁷. This can be a potential antiviral drug against SARS-CoV-2 infection, although there are still not sufficient clinical data to support its efficacy.