Tryptophan trimers and tetramers for use in the treatment and/or prevention of betacoronavirus infection, particularly SARS-CoV-2

CSIC and the University of Valencia have identified a group of compounds (tryptophan trimers and tetramers) for use in the treatment and/or prevention of betacoronavirus infections, particularly against SARS-CoV-2 infection.

Industrial partners from the pharmaceutical industry are being sought to collaborate through a patent licence agreement and/or a co-development agreement.

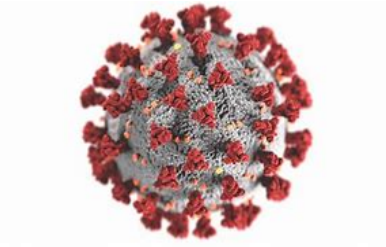
An offer for Patent Licensing and/or co-development agreement

New antivirals against SARS-CoV-2 and other betacoronavirus infections that specifically inhibit the virus entry into the host cell

The on-going COVID-19 pandemic is caused by the infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus was first identified in Wuhan (China) in Dec 2019, and rapidly spread around the globe. As of the 4th of November 2021, more than 247 million cases and 5 million deaths have been reported, making it one of the deadliest pandemics in history.

The betacoronaviruses include 3 human pathogens, Middle East respiratory syndrome coronavirus (MERS-CoV), and two related viruses termed severe acute respiratory syndrome coronavirus (SARS-CoV) and SARS-CoV-2. Despite using two different host cell receptors, structural studies have shown these coronaviruses bind their cognate receptor in a similar manner. The high functional similarity of betacoronaviruses Spike protein suggests that they could be inhibited by similar antiviral compounds.

The inventors have developed new betacoronavirus antivirals useful for inhibiting virus entry through inhibition of the interaction of viral Spike (S) proteins with the cellular host cell receptor(s).



SARS-CoV-2 virus particle

Main innovations and advantages

- The compounds are able to block viral entry of SARS-CoV-2 at concentrations in the low micromolar range using pseudovirus particles that express in their surface the S protein of the Wuhan SARS-CoV-2 strain in two cell lines (Vero and A549ACE2-TMPRSS2 cells).
- The lead compounds have also shown antiviral activity against SARS-CoV-2 infection in vitro in the low micromolar range without reaching the 50% toxicity at the highest concentration tested (100 μM).
- Optimization of lead compounds together with testing their ability to block viral entry of different variants of SARS-CoV-2 and another coronavirus, such as SARS-CoV, are on-going

Patent Status

Priority patent application filed suitable for international extension

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