
Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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# Phytotherapeutics and SARS-CoV-2 infection: Potential role of bioflavonoids

*To the Editor:*

SARS-CoV-2 is a single-stranded RNA β-coronavirus containing 29,891 nucleotides encoding for 9860 amino acids. Genomic characterization showed 89% nucleotide identity with bat SARS-Like-CoVZXC21 and 82% with Human SARS-CoV [1]. After its first isolation in Wuhan in the end of December 2019, the virus has spread rapidly worldwide becoming the most important public health concern. Numerous antiviral and non-antiviral medicines are presently experimented in order to reduce the morbidity and the mortality related to the pandemic. Furthermore, considering the severity of pandemic consequences for public health and economy, many researchers are working hard for new specific drugs and vaccines. Zhang and colleagues found the compound 13b, a novel α-ketoamide, inhibited the purified recombinant 2019-n-CoV MPro with a IC50 of 0.67 μM [2]. Main protease MPro and the papain-like protease are fundamental for processing polyproteins translated from the viral RNA. Wang and colleagues showed the human monoclonal 47D11 antibody exerted its activity to neutralize SARS-CoV-2 binding a conserved epitope on the spike receptor binding domain. This receptor action is performed through a mechanism independent from the receptor binding inhibition and could be useful to prevent or treat SARS-CoV-2 infection and for developing antigen detection tests [3]. Despite the promising opportunities, the timing for the development of new effective therapies against SARS-CoV-2 is unpredictable. Considering the spread and severity of complications, physicians involved in the treatment of infected patients need as many therapeutic alternatives as possible today. At this regard, Adem and colleagues in their virtual screening based molecular docking study reported a potential binding affinity exerted by some bioflavonoids at the active site of the MPro. Potential inhibition properties were studied using the Molegro Virtual Docker Program and some flavonoids, in particular hesperidin and rutin, showed a better affinity for the MPro than nelfinavir [4]. Bioflavonoids are well known for many biological and therapeutic effects including antioxidant and antiviral properties. Moreover, starting from the information related to the therapeutic activities of natural compounds, numerous synthetic and semi-synthetic derivatives have been synthesized in order to enhance the pharmacological effects. Particularly, hesperidin and rutin derivatives displayed antimicrobial effects in absence of toxicity in preclinical studies [5]. Despite the absence of clinical data, the current emergency state requires the use of all available therapeutic tools and the potential antiretroviral activity of hesperidin, rutin and their derivatives could be exploited as co-treatment in patients affected by respiratory complications related to the SARS-CoV-2 infection or as preventive treatment.

Authors report no potential conflict of interests.

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