

Chapter-7

Flavonoid Based Therapies in COVID -19

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Abstract

The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in December 2019 in Wuhan, China led to the global COVID-19 pandemic, declared by the World Health Organization on March 11, 2020. This outbreak rapidly evolved into one of the most significant public health crises of modern times, profoundly affecting healthcare systems, economies, and social structures worldwide. SARS-CoV-2 belongs to the Coronaviridae family and is an enveloped, positive-sense, single-stranded RNA virus with one of the largest viral genomes (26–32 Kbp). While infection can affect individuals of all ages, severe disease is more frequently observed in older adults and those with comorbidities such as diabetes, cancer, cardiovascular disorders, and chronic respiratory diseases. Transmission occurs primarily through respiratory droplets and aerosols released during coughing, sneezing, speaking, or breathing. Symptoms typically appear 2–14 days after exposure and may range from mild to severe, including fever, shortness of breath, cough, fatigue, gastrointestinal disturbances, and loss of taste or smell.

To date, nearly thirty coronaviruses have been identified that infect humans and various animal species. In response to COVID-19, multiple vaccination strategies have been developed, including advanced nanotechnology-based approaches. Novel vaccine platforms, such as chitosan–polyethylene glycol nanocomposites carrying target antigens, have demonstrated enhanced immunogenicity, improved stability, and promising protective efficacy.