Chapter-11

Future Directions in Flavonoid Research and COVID-19 Management

Tejaswi* ,Poonam

Department of Pharmacy,School of Healthcare and Allied Sciences, GD Goenka University, Sohna, Gurugram-122103

Corresponding Author

Tejaswi

choudharytejaswi@gmail.com.

Abstract

Flavonoids, a diverse group of plant-based bioactive compounds, have long been valued in both traditional medicine and modern nutrition for their broad health benefits. In the context of COVID-19, these compounds have gained significant attention due to their potential to block viral entry, inhibit replication, modulate immune responses, and protect against oxidative damage. Found abundantly in fruits, vegetables, herbs, and medicinal plants, flavonoids are a natural resource with great therapeutic potential. Recent experimental and computational studies indicate that certain flavonoids can bind to key viral proteins such as the spike glycoprotein, main protease, and RNA-dependent RNA polymerase, while also reducing the inflammation and oxidative stress that contribute to disease severity. However, limitations like poor water solubility, rapid metabolism, and low systemic bioavailability have hindered their clinical use. Innovative delivery methods, including nanotechnology-based formulations and bio-enhancer strategies, are now being developed to overcome these challenges. This chapter examines the structural diversity, biological mechanisms, scientific evidence, and prospects of flavonoids as part of an integrated approach to managing COVID-19 and preparing for future respiratory pandemics.

https://doi.org/10.70593/978-93-49910-94-2_11