Chapter 4
Quercetin for the Experimental Treatment of COVID–19

Kunal Bhattacharya

https://orcid.org/0000-0002-5546-1504

NETES Institute of Pharmaceutical Science, India

Nongmaithem Randhoni Chanu

FPS, Assam Downtown University, India

Atanu Bhattacharjee

Royal School of Pharmacy, The Assam Royal Global University, India

Ripunjoy Bordoloi

NETES Institute of Pharmaceutical Science, India

Bhargab Jyoti Sahariah

NETES Institute of Pharmaceutical Science, India

Apurba Talukdar

NETES Institute of Pharmaceutical Science, India

Ramen Kalita

NETES Institute of Pharmaceutical Science, India

ABSTRACT

The pandemic, which is brought about by the SARS CoV-2 infection, has inundated the entire world and obliterated the economies of numerous nations. Hence, looking for treatment and prophylaxis of COVID-19, Quercetin, which is a flavonoid gotten from plants and different sources like grapes, onion, tomatoes, apple, and so forth and has various properties like calming property, cardioprotective, and neuroprotective properties, is inspected for its antiviral properties, so it tends to be considered as one of the adjuvant medicines alongside the pharmacological medicines like Remdesivir and plasma treatment. A survey of the antiviral property of Quercetin from distributed articles proposes that Quercetin has a solid antiviral movement towards SARS C0V-2 and other upper respiratory tract infections. It can be securely and financially used to battle COVID-19. For high-hazard populaces, this medication can be a brilliant decision of treatment. Here the authors give proof to the utilization of Quercetin in relationship with pharmacological treatments like Remdesivir or improving plasma treatment.

INTRODUCTION

The COVID-19 Pandemic which is caused by the SARS CoV-2 virus has engulfed the whole world and destroyed the economies of many countries. Therefore, in search of treatment and prophylaxis of COVID 19 Quercetin which is a flavonoid obtained from plants and various sources like grapes, onion, tomatoes, apple, etc (Lakhanpal, 2007) and has different properties like anti-inflammatory property, cardioprotective and neuroprotective properties is reviewed for its anti-viral properties so that it can be considered as one of the adjuvant treatments along with the Pharmacological treatments like Remdesivir and convalescent plasma therapy. A review of the antiviral property of Quercetin from reputed published articles suggests that Quercetin has a strong antiviral activity towards SARS C0V-2 and other upper respiratory tract viruses. Quercetin helps in inhibiting the viral infection by different mechanisms such as blocking the entry of the virus, interfering with the DNA and RNA polymerases, and inhibiting reverse transcriptase enzyme (Colunga 2020). Therefore, it is suggested to consider the use of quercetin in high-risk populations for COVID-19 in combination with other pharmacological therapies. Quercetin was found economical to use and did not show severe side effects. Severe Acute Respiratory syndrome also known as SARS CoV-2 has become one of the deadliest pandemic mankind has ever seen. It is not only destroying human life but also the economies of the country. Till 13th September 2020 the recorded cases worldwide are 299,110,980 out of which 926, 925 patients have died. Therefore, the need of the hour is to develop a pharmacology-based treatment for the COVID-19 disease. A flavonoid is known as Quercetin which has been proved to have very good Antiviral properties can be safely and economically used to fight COVID-19. For high-risk populations, this drug can be an excellent choice of treatment. Here we are providing evidence for the use of Quercetin in association with Pharmacological Treatments like Remdesivir or convalescent plasma therapy (Figure 1).

BACKGROUND

Natural products were known for their beneficial properties for wellbeing sometime before flavonoids were identified and isolated. More than 4000 assortments of flavonoids have been recognized, a large number of which are liable for their appealing shades of blossoms, leaves, and fruits. In nature, flavonoids are available as methylated derivatives, glycosides, and aglycones. In a six-membered ring, a benzene ring is condensed in flavonoid aglycone whereas a substituent in the second position phenyl ring is present. Based on the molecular structure, flavonoids are differentiated into various classes such as flavone, flavonol, flavanone, flavanol, isoflavone, and anthocyanidin mainly as given in Figure 1 (Lakhanpal and Rai, 2007). A dihydro derivative of pyrone or pyrone itself is attached to the six-membered ring. Classification of flavonoids into isoflavonoids and flavonoids is based on the position of the benzenoid substituent. The difference between flavanones and flavonols is because of the double bond at C2 and C3 position and hydroxyl group which is at the third position (Havsteen, 1983). Quercetin is Widely found in Vegetables, leaves, grains, and seeds the plant flavonoid quercetin which is also known as 3,3′,4′5,7-pentahydroxyflavone forms quercetin glycosides by conjugating with residual sugars (Li et al., 2016). It is very much evident from various studies that quercetin has antiviral, anti-inflammatory (Uchide and Toyoda, 2011), antioxidant (Robaszkiewicz et al., 2007), and immunoprotective effects (Nair et al., 2002). Because of the Polymerase inhibiting the activity of quercetin studies have been conducted on various models of viral infections in inhibiting polymerases (Shinozuka et al., 1988), reverse transcriptase (Spedding et al., 1989), proteases (Bachmetov et al., 2012), binding viral capsid proteins, and suppressing DNA gyrase (Debiaggi et al., 1990; Cushnie and Lamb, 2005). (Figure 2)

Related Content

The Changing Structure of Decision Support Systems Research: An Empirical Investigation through Author Cocitation Mapping (1990-1999)
Sean Eom (2009). *Author Cocitation Analysis: Quantitative Methods for Mapping the Intellectual Structure of an Academic Discipline (pp. 318-342).*
www.irma-international.org/chapter/changing-structure-decision-support-systems/5452

Building Databases and the Cocitation Counts Generation System Using Microsoft Excel Program in Visual Basics
Sean Eom (2009). *Author Cocitation Analysis: Quantitative Methods for Mapping the Intellectual Structure of an Academic Discipline (pp. 137-142).*
www.irma-international.org/chapter/building-databases-cocitation-counts-generation/5445

Bringing the Librarian to Online Courses: Cognitive, Social, and Teaching Presence
Nancy Weissmanand Karen Swan (2013). *Advancing Library Education: Technological Innovation and Instructional Design (pp. 153-171).*
www.irma-international.org/chapter/bringing-the-librarian-to-online-courses/88894

Discovering Our Library's Resources: Vendor Tools Versus In-House Tools
Amy S. Jackson, Kevin Comerford, Suzanne M. Schadland Rebecca Lubas (2012). *Planning and Implementing Resource Discovery Tools in Academic Libraries (pp. 338-350).*
www.irma-international.org/chapter/discovering-our-library-resources/67829

Information Literacy
Sulyman Sodeeq Abdulakeem, Adeyemi Yusuf Abiodunand Kolawole Adebayo Abel (2020). *Handbook of Research on Emerging Trends and Technologies in Library and Information Science (pp. 156-168).*
www.irma-international.org/chapter/information-literacy/241562