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Screening for natural and derived bio-active compounds in preclinical and clinical studies: One of the frontlines of fighting the coronaviruses pandemic

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Abstract
Background: Starting December 2019, mankind faced an unprecedented enemy, the COVID-19 virus. The world convened in international efforts, experiences and technologies in order to fight the emerging pandemic. Isolation, hygiene measure, diagnosis, and treatment are the most efficient ways of prevention and intervention nowadays. The health organizations and global care systems screened the available resources and offered recommendations of approved and proposed medications. However, the search for a specific selective therapy or vaccine against COVID-19 remains a challenge. Methods: A literature search was performed for the screening of natural and derived bio-active compounds which showed potent antiviral activity against coronaviruses using published articles, patents, clinical trials website (https://clinicaltrials.gov/) and web databases (PubMed, SCI Finder, Science Direct, and Google Scholar). Results: Through the screening for natural products with antiviral activities against different types of the human coronavirus, extracts of Lycoris radiata (L'Hér.), Gentiana scabra Bunge, Dioscorea batatas Decne., Cassia tora L., Taxillus chinensis (DC.), Cibotium barometz L. and Echinacea purpurea L. showed a promising effect against SARS-CoV. Out of the listed compound Lycorine, emetine dihydrochloride hydrate, pristimerin, harmine, conessine, berbamine, 4`-hydroxychalcone, papaverine, mycophenolic acid, mycophenolate mofetil, monensin sodium, cycloheximide, oligomycin and valinomycin show potent activity against human coronaviruses. Additionally, it is worth noting that some compounds have already moved into clinical trials for their activity against COVID-19 including fingolimod, methylprednisolone, chloroquine, tetrandrine and tocilizumab. Conclusion: Natural compounds and their derivatives could be used for developing potent therapeutics with significant activity against SARS-COV-2, providing a promising frontline in the fighting against COVID-19. © 2020 Elsevier GmbH

Author Keywords
Antiviral; Clinical trials; COVID-19; Natural products; Patent; Protection

Index Keywords
4' hydroxychalcone, antivirus
agent, berbamine, chloroquine, conessine, cycloheximide, emetine, fingolimod, harmine, lycorine, methylprednisolone, monensin, mycophenolate mofetil, mycophenolic acid, natural product, oligomycin, papaverine, plant medicinal
product, pristimerin, tetrandrine, tocilizumab, unclassified drug, valinomycin, antivirus agent, biological product, plant medicinal product; antiviral activity, Cibotium barometz, clinical study, Coronavirinae, coronavirus disease 2019, Dioscorea polystachya, drug approval, drug efficacy, drug screening, Echinacea purpurea, gentian, Gentiana scabra, human, Lycoris radiata, medicinal plant, nonhuman, pandemic, pathogenesis, preclinical study, prescription, priority journal, Review, Senna tora, Severe acute respiratory syndrome coronavirus 2, Taxillus chinensis, virus classification, virus morphology, virus replication, virus transmission, chemical structure, clinical trial (topic), drug effect, drug therapy; Antiviral Agents, Biological Products, Clinical Trials as Topic, COVID-19, COVID-19 Vaccines, Drug Evaluation, Preclinical, Humans, Molecular Structure, Pandemics, Plant Preparations, SARS-CoV-2

Chemicals/CAS

berbamine, 478-61-5; chloroquine, 132-73-0, 3545-67-3, 50-63-5, 54-05-7; cycloheximide, 642-81-9, 66-81-9; emetine, 316-42-7, 483-18-1; fingolimod, 162359-56-0; harmine, 343-27-1, 442-51-3; lycorine, 476-28-8, 74555-92-3; methylprednisolone, 6923-42-8, 83-43-2; monensin, 17090-79-8, 22373-78-0; mycophenolate mofetil, 116680-01-4, 128794-94-5; mycophenolic acid, 23047-11-2, 24280-93-1; oligomycin, 1404-19-9; papaverine, 58-74-2, 61-25-6; pristimerin, 1258-84-0; tetrandrine, 518-34-3; tocilizumab, 375823-41-9; valinomycin, 2001-95-8; Antiviral Agents; Biological Products; COVID-19 Vaccines; Plant Preparations

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