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Coronavirus, Covid19, Covid-19 and SARS-Cov-2: A Global Pandemic, A Short Review

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Abstract

Coronavirus or Covid-19 is a pandemic; a disease which has severely crippled the entire world with the rise of more than 2,000,000 confirmed cases across the global, and a death toll exceeding 170,000. This global pandemic Covid-19 touches every aspect of people's lives including one's health, education, and of course one's financial situation. With the great hope of finding a cure for this illness, there's naturally an on-going, worldwide effort to identify effective drugs and to develop vaccines. Our contribution to this unprecedented endeavour includes a comprehensive review using three research sources: *Web of Sciences*: *Scopus and Google Scholar*, using these four keywords; "Coronavirus" or," Covid19" or, "Covid-19" or, "SARS-Cov-2. We emphasize the important role of science in general, along with the significance of chemistry in fighting this virus and helping the scientific world at large to come up with the cure by developing drugs or vaccines as rapidly as is humanly possible! At the time of writing this review, scientists have discovered 69 potential drug molecules for the treatments of coronavirus and they are using just 4 of them in medical treatments, which are under the supervision of the World Health Organisation.

1. Introduction

In this period of a global pandemic, the practical applications of chemistry and research in general, have proven that several keen measures will keep you safe. These actions are numerous and new ones are implemented every day. Following the news "live" on various media, websites and social networks, allows you to discover that these actions have become more efficient and diverse. Many scientific bodies (including learned societies and publishers), are currently providing articles and research work on the Covid-19 which are available free of charge. The American Chemical Society (ACS) has put out articles which characterize the structure of the coronavirus along with its mechanism of infection [1-45]. They have started feeding content into PubMed Central as soon as it becomes available, and licensing it to maximize discoverability and usability for all tools related to coronavirus research freely available to the global scientific community [46-73]. To assist health workers and researchers working under challenging conditions to bring this outbreak to an end, The Lancet has created a Coronavirus Resource Centre. This resource brings together new 2019 novel coronavirus disease (COVID-19) content from across The Lancet journals as it is being published. All of our COVID-19 content is free to access [74-89]. Additionally, Elsevier provides continuously updated resources from the "Elsevier's Novel

Coronavirus Information Center" comprising of information for the research and health community on SARS-CoV-2 (the novel coronavirus) along with COVID-19 (the disease.) All resources are free to access, with more than 21,000 related articles which are also free to access on ScienceDirect. [90-130]. What we can also derive from this is that the list of references is far from exhaustive as many scientific papers and research have been and will be forthcoming in the days and weeks ahead, as well as in the distant future.

2. Scientific communities fighting coronavirus

Recent events have shown us once again, how rapidly and quickly a new disease can take root and spread. Such events are accompanied by an explosion of clinical and epidemiological information and research. The first thing that was established is the proximal genome sequence of Coronavirus called SARS Cov-2 (**Fig.1**) [131]. With this known sequence, and in comparison, to other coronavirus, it helps a lot to know how we can fight this Human -SARS-CoV-2 virus and stop this global tragedy from worsening.

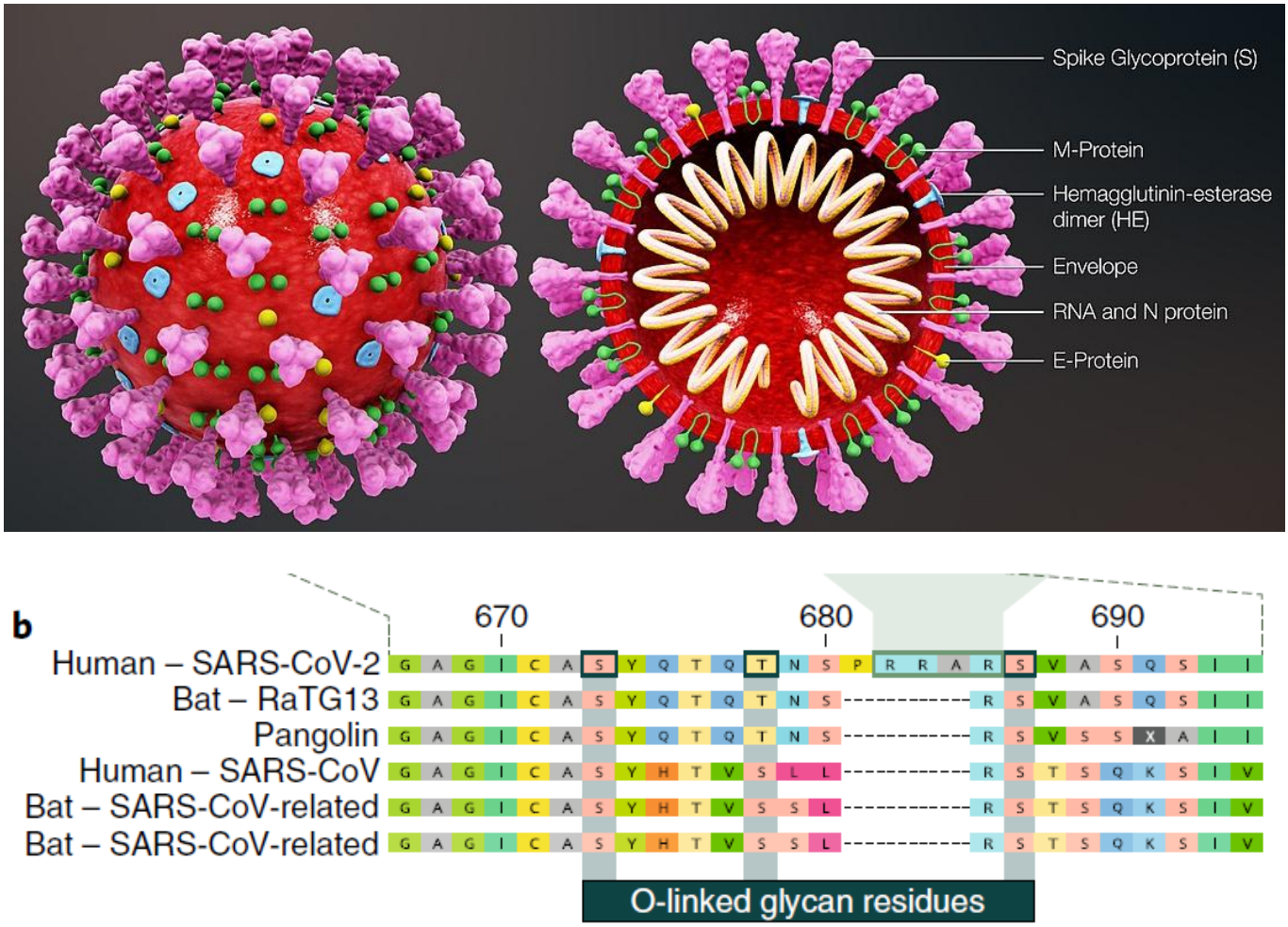


Figure 1: (**a**) The 3D of Coronavirus Structure (Wikipedia); **b)** Proximal Genome Comparison of Human SARS-Cov-2 and others Coronavirus [131].

Scientists worldwide have responded almost immediately to fight this virus by finding 69 potential drug candidates which may help treat COVID-19 (**Fig. 2**) [132]. By protein mapping, they identify the binding sites between the human protein and the coronavirus and the protein S from which Coronavirus can inject its genome into a human cell. From this global study the World Organisation of Health (WHO) has identified 4 promising clinical treatments of COVID-19 (**Fig. 3**) (Hydroxychloroquine, Remdesivir, Lopinavir and Interferon-beta) [133].

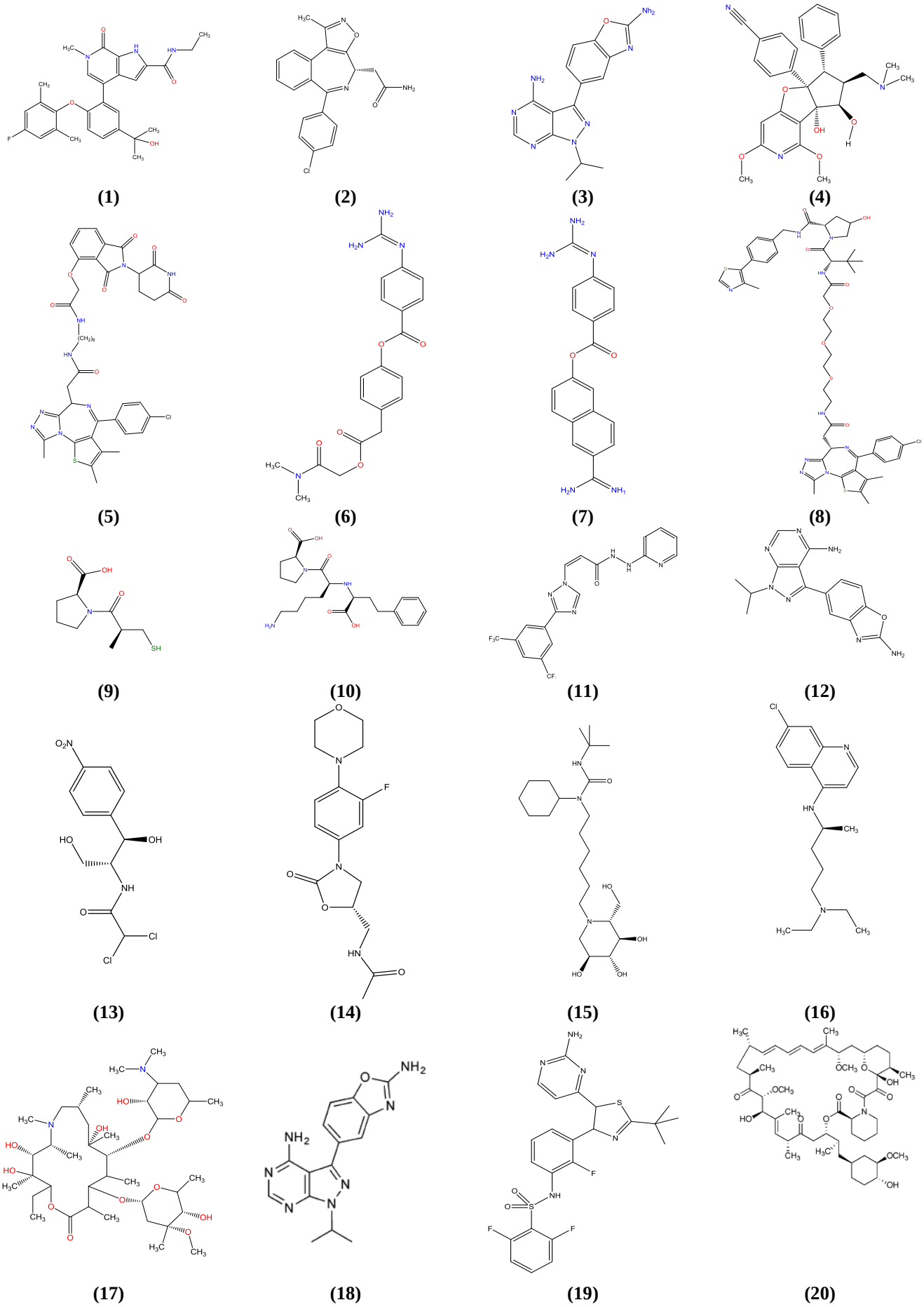
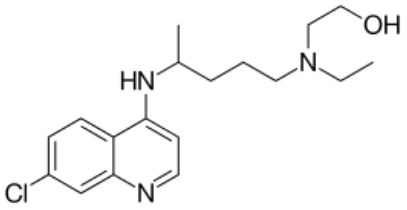
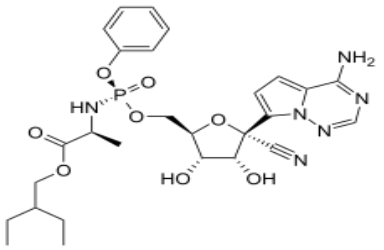


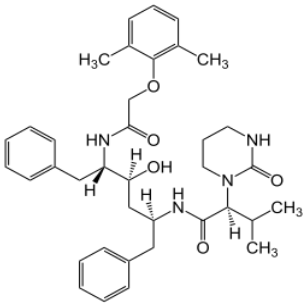
Figure 2: some examples from the 69-potential drug candidates for fighting coronavirus [132].



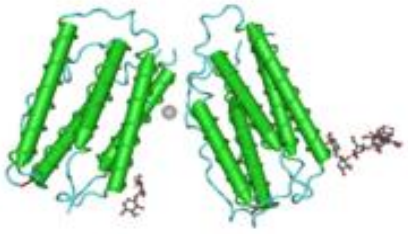
Hydroxychloroquine



Remdesivir



Lopinavir



Interferon-beta

Figure 3: Four promising clinical treatment for Covid-19, advised by WHO [133].

For the time being, molecular dynamics simulations of the pandemic include influenza A H_1N_1 2009 viral envelope, containing ~160 million atoms and spanning ~115 nm in diameter. This simulation helps us to see how the virus actually looks and provides fundamental insights into the understanding of substrate recognition processes for this vital influenza drug target, suggesting a new strategy for the development of anti-influenza therapies [134]. Additionally, the insights and strategies for drug and vaccine developments fighting Covid-19, involve is a simplest method, where chemistry was implicated. To avoid the spear of the coronavirus infection, washing hands properly with soap and water and by maintaining this good habit, the soap can literally destroy the lipidic membrane enveloping of the coronavirus shell, which is characteristic of the beta-coronavirus family. Another point regarding the importance of chemistry is the use of alcoholic solutions for washing hands, which usually comes in the form of commercial hand sanitizers.

3. Scientific information for research on fighting Coronavirus

3.1. Web of Science: by using the world's largest publisher-neutral citation index and research intelligence platform (Clarivate Analytics), we used these four keywords: "Coronavirus" or "Covid19" or "Covid-19" or "SARS-Cov-2." Our Results: 14,682 documents (from the Web of Science Core Collection). As you can see from the **Fig.4**, this topic is dispersed between all disciplines, such as Virology, Infectious diseases, Biochemistry, Molecular biology, Medicinal (general internal), Veterinary sciences, Immunology, Biotechnology Applied Microbiology, Microbiology , Medicine Research Experimental, Biotechnology Applied Microbiology, Multidisciplinary Sciences and others. The publication inclusive of these keywords and topics have increased extraordinarily from 2011 to the recent days of 2020, showing the importance and the collective interest in this topic, by the world's scientific community (**Fig.5**). These publications and documents need funding in order to be completed. Also, these topics (Coronavirus, Covid19, Covid-19, SARS-cov-2) attract a lot of funding agencies such as the United States Department of Health and Human Services, (NIH) the National Institute of Allergy and Infectious Diseases, (NIAID), the National Institute of Neurological Disorders Stroke, the National Institute of Health (NIH) in the USA, the National Natural Science Foundation of China, the Ministry of Education and Culture, Sports, Science and Technology in Japan, and finally the German Research Foundation (DFG), and finally the National Key Research and Development Program of China along with others (**Fig .6**).

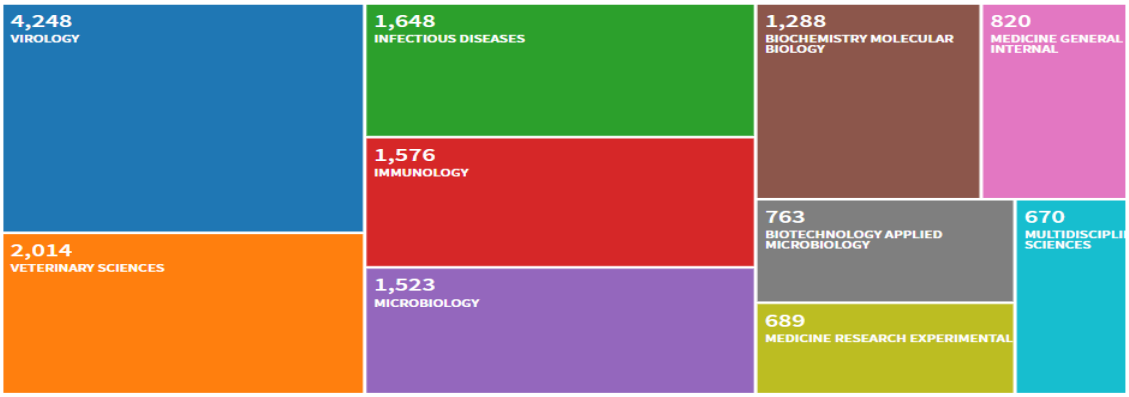


Figure 4: Visualization of lot off discipline publishing about Corona virus (source Web of Science).

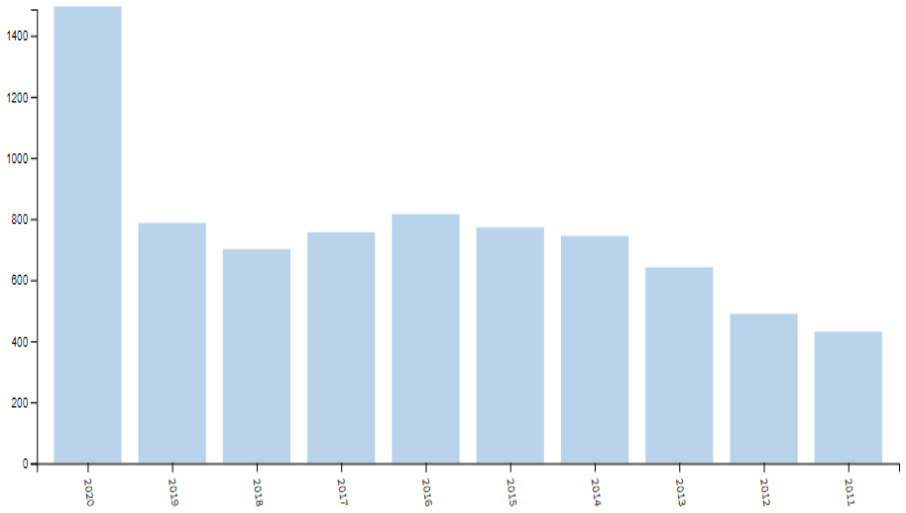


Figure 5: Visualization of publication years 2011-2020 about Coronavirus (source Web of Science).

Figure 6: Visualization of Funding Agencies about Coronavirus project (source Web of Science).

There is further information we can obtain from the Web of Science pertaining to these aforementioned keywords (Coronavirus or Covid19 or Covid-19 or SARS-Cov-2), such as the background of these authors, the various types of documents, the involved countries including their predominant regions and many more interesting factors, to help public health authorities, researchers and clinicians contain, treat and manage this disease.

3.2. Scopus:

This provides you with the platform and analytical tools to showcase and leverage research quickly. We used the same keywords (Coronavirus or Covid19 or Covid-19 or SARS-Cov-2) which turned up 20,917 document results. The dispersion of these documents by subject area gives the Medicine, Immunology, Biochemistry, and Veterinary the big percentages (**Fig.7**).

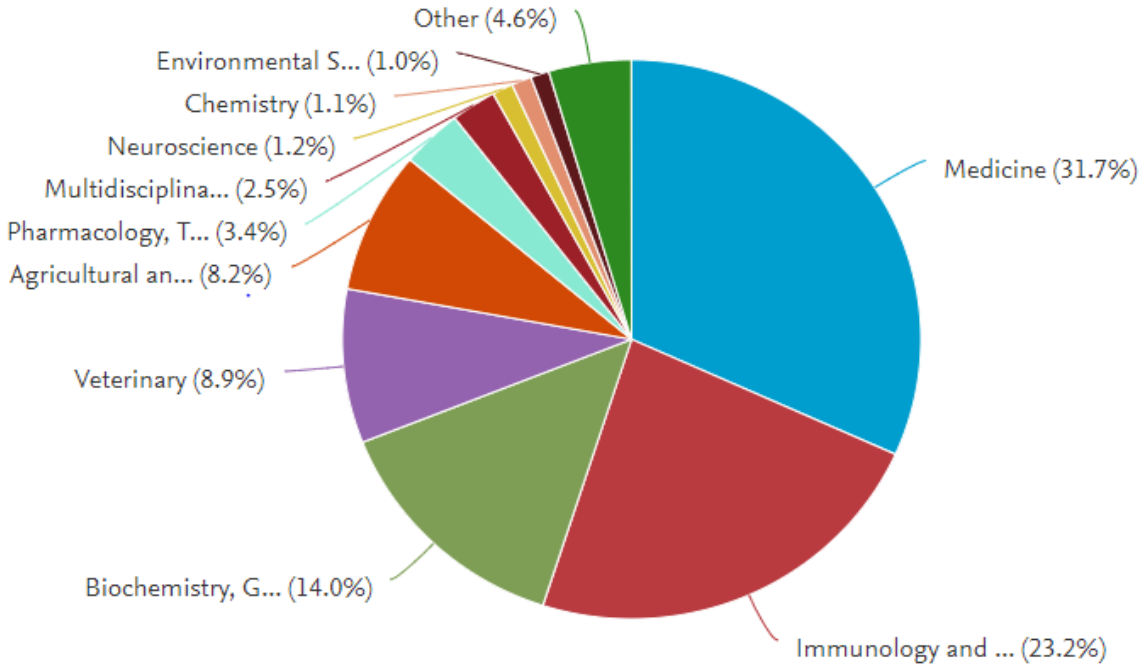


Figure 7: Document by subject area about Coronavirus keywords (source Scopus).

The distribution of these documents by year (**Fig. 8**) gives the same conclusion in research done in the *Web of Science*, as these keywords are very attractive and important for scientists and researchers, at this time especially. As you can see from the figure, publications increase significantly and drastically from the 2019 steadily, until now (April 2020).

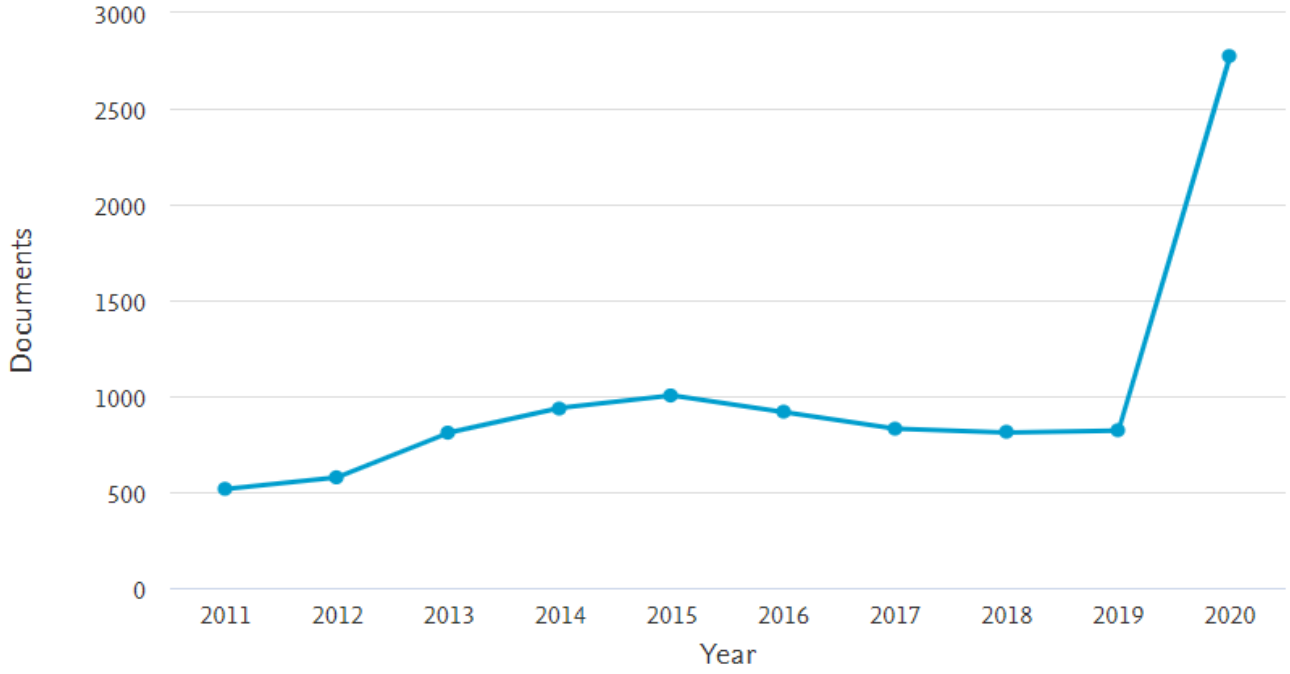


Figure 8: Documents distribution by year about Coronavirus keywords (source Scopus).

The research cannot be done without significant funding. In this context, we compare 15 funding agencies and organisations using Scopus alone with the same keywords (**Fig.9**), Hence, figure assists scientists who are currently looking for funding and collaborations.

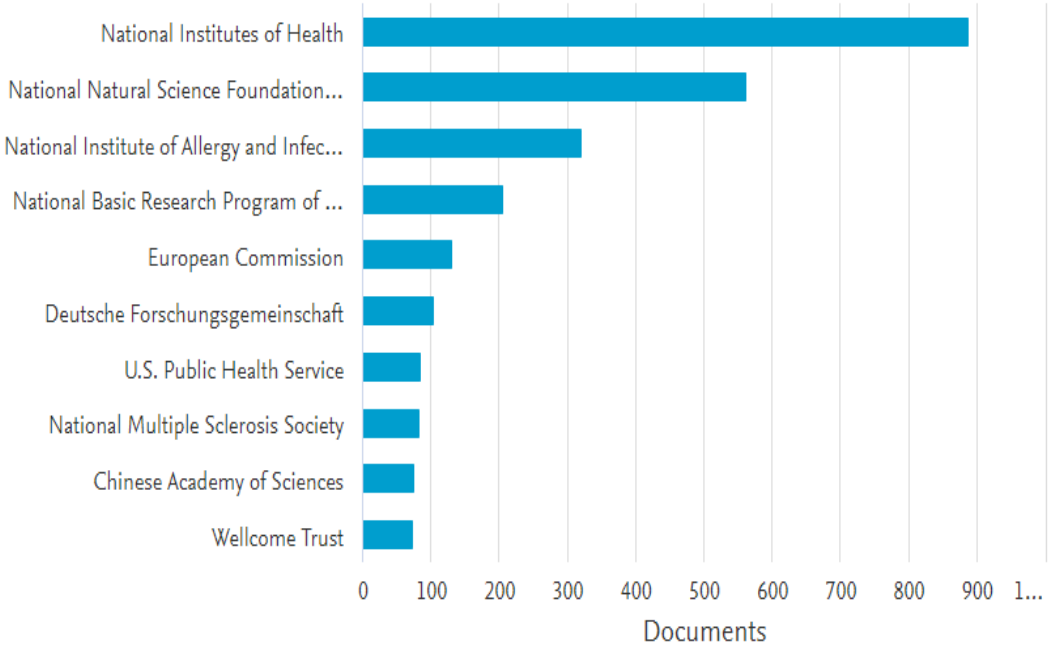


Figure 9: Documents distribution by Funding sponsors (source Scopus).

From the Scopus database we can discover many important and interesting items such as authors, affiliations, countries, and their localities. All of this information matters, as it can help to accelerate the research in better fighting this disease.

3.3 Google Scholar:

It provides a simple way to search broadly for scholarly subjects and helps you to find relevant work across the world of scholarly research. We used the same keywords (Coronavirus, Covid19, Covid-19 or SARS-Cov-2) and found 59.100 documents regarding to these subjects. From this enormous number, we can conclude that this topic is of great importance, and especially at the present time. The Google Scholar program includes information about research as well as patents. Furthermore, you can find information about authors, publication years, funding resources, highlighted work, and more.

Conclusion

Recent events have reminded us of how rapidly a new disease can take hold and spread like wildfire. Such events are accompanied by an explosion of clinical and epidemiological information and research. The objective of this review is to demonstrate the solidarity of scientists and research results; without barriers, we can help public health authorities, researchers and clinicians contain and manage this disease. And last, but certainly not least, with this review, we can aid our students in getting these bibliographic tools for the sake of more quickly achieving their goals and purposes.

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