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Editorial: Development/ repurposing of drugs to tackle the multiple variants of SARS-CoV-2

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Editorial on the Research Topic
Development/repurposing of drugs to tackle the multiple variants of SARS-CoV-2

COVID-19, the severe acute respiratory syndrome caused by Coronavirus (SARS-CoV-2) and identified for the first time in China in 2019, was recognized in 2020 as a global pandemic by the World Health Organization (Wu et al., 2020; WHO, 2023). Although elder people and all those with underlying medical conditions like cardiovascular disease, diabetes, chronic respiratory disease, or cancer are more likely to develop serious illness, people at any age can become seriously ill or die (WHO, 2023). The efforts of pharmaceutical companies and academia have successfully led to several vaccines against this virus in an unprecedented short period of time. Although vaccines provide protection to healthy people, they could be not effective for immune compromised individuals or those bearing some risky pathological co-morbidities. Additionally, mutations could generate viral variants unaffected by currently available vaccines. Therefore, new chemotherapeutic agents are urgently needed for the treatment of SARS-CoV-2 in order to reduce virus dissemination and mortality. Although huge efforts are being made since 2020 towards the development of new drugs or the repurposing of already approved drugs to other targets, which would lead to a significant drop in the approval time of these drugs, drugs for the treatment of COVID-19 are not yet a reality (Ashburn and Thor, 2004; Nosengo, 2016; WHO, 2023). At present, there is a clinical need for direct-acting antivirals targeting SARS-CoV-2 to complement existing therapeutic strategies.

Accordingly, the aim of this Research Topic of Frontiers in Drug Discovery, Anti-infective Agents, is to collect latest research on the topic focused on:

- Development of new chemotherapeutic agents to treat SARS-CoV-2
- Identification of possible drugs for repurposing/repositioning to treat SARS-CoV-2
- Provide drug-like hits for lead optimization to yield highly potent antiviral agents

In the following, the contributions covered in this Research Topic are summarized in alphabetical order of family name of corresponding author.

Prada Gori et al. identified through drug repurposing screening, validated by experimental assays, two clinical drugs targeting SARS-CoV-2 main protease (MPro), atpenin and tinotamustine. A target-focused computer-aided drug repositioning study against this indispensable virus protease was performed searching for new inhibitors that was followed by experimental testing of a small subset of the identified hits.

Asadi Anar et al. reviewed recent literature about the connection between administration of selective serotonin reuptake inhibitors (SSRIs) and COVID-19 prognosis which suggests that repurposing of this class of drugs could be useful for the early treatment of severely afflicted patients.

Jain et al. selected Atovaquone to perform a prospective randomized double-blind placebo-controlled clinical trial for the treatment of COVID-19 in hospitalized patients. Atovaquone had been identified as a promising candidate to inhibit the virus replication through an *in silico* screen to identify FDA approved drugs that inhibit SARS-CoV-2. The study showed no evidence of enhanced SARS-CoV-2 viral clearance compared with placebo.

Hao et al. performed a randomized, placebo-controlled, single blind phase 1 study of safety, tolerability and pharmacokinetics of two SARS-CoV-2 spike targeting monoclonal antibodies. The study showed that both drugs are safe, well-tolerated and suitable therapeutic or prophylactic options for the infection.

Kaplan et al. performed a randomized 1:1 placebo-controlled clinical trial on Zinc and Resveratrol that have been reported to have antiviral activity. Patient self-collected nasal and saliva samples were used. Results showed that SARS-CoV-2 shedding and COVID-19 symptoms were not statistically significantly decreased by treatment.

As a concluding remark, this issue exemplify recent progress in the efforts for developing new chemotherapy for the treatment of COVID-19 with special emphasis on discovering new drugs and repurposing of old ones. I would like to specially thank all the contributors.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

References

Ashburn, T., and Thor, K. (2004). Drug repositioning: Identifying and developing new uses for existing drugs. *Nat. Rev. Drug Discov.* 3, 673–683. doi:10.1038/nrd1468

Nosengo, N. (2016). Can you teach old drugs new tricks? *Nature* 534, 314–316. doi:10.1038/534314a

WHO (2023). Coronavirus disease (COVID-19). Available at: https://www.who.int/health-topics/coronavirus#tab=tab_1 (Accessed January, 2023).

Wu, F., Zhao, S., Yu, B., Chen, Y. M., Wang, W., Song, Z. G., et al. (2020). A new coronavirus associated with human respiratory disease in China. *Nature* 579, 265–269. doi:10.1038/s41586-020-2008-3