

For consideration under COVID -19 Initiatives by NITs

Project Title: Synthesis of Drugs for The Prevention of COVID-19

Research Area: Treatment: Pharmacological, Non-Pharmacological

Abstract: A new coronavirus identified as COVID-19, also known as SARS-CoV-2, is a new etiological agent responsible for viral pneumonia outbreak that commenced in China and spread world-wide, resulting in the pandemic of 2020. Currently there are no targeted therapeutics and effective treatment options remain very limited. Therefore, It is crucial to develop safe and effective vaccines to control the COVID-19 pandemic, eliminate its spread, and ultimately prevent its future recurrence. In order to rapidly discover lead compounds for clinical use, we planned for the synthesis of different drug candidates as well as screening to identify new drug leads that target the COVID-19 virus. We wish to speculate that our designed drugs may have a prominent role in preventing the transmission of the virus, as well as aid in its treatment.

Proposed Methodology:

Remdesivir belongs to developed by Gilead Sciences a class of antiviral drugs that inhibit RNA-dependent RNA polymerase, an enzyme essential for some RNA viruses resembling SARS-CoV- 2 to replicate. Thus, inhibiting the enzyme might prevent viral replication in infected cells.

1. Synthesis of nucleoside analogues of Remdesivir for antiviral screening:

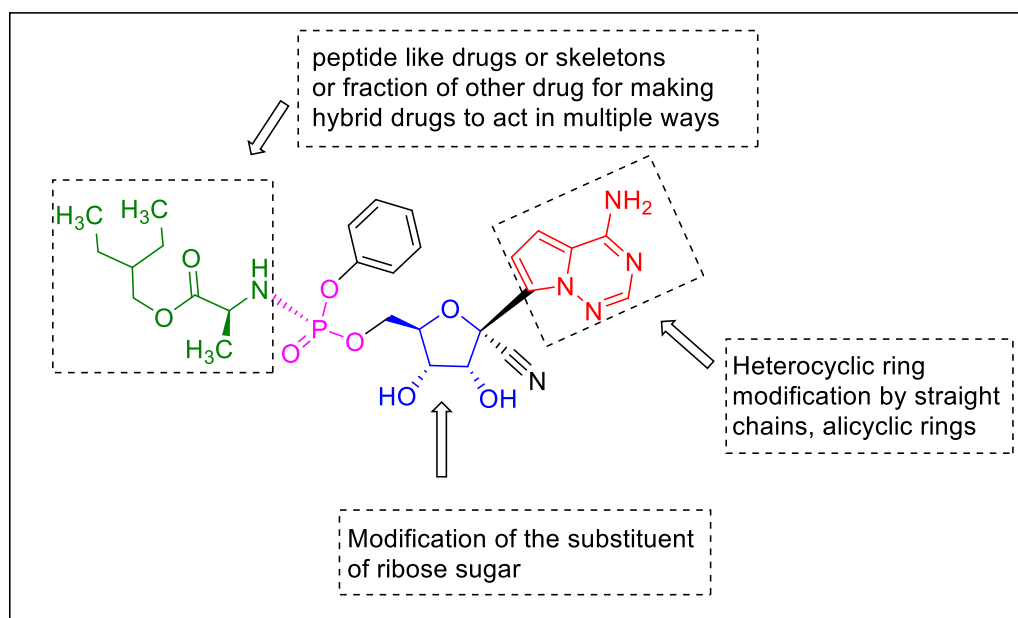


Figure 1: Planned modification of Remdesivir drug

We have also designed the synthesis of different analogues of Remdesivir drug for the screening of COVID-19.

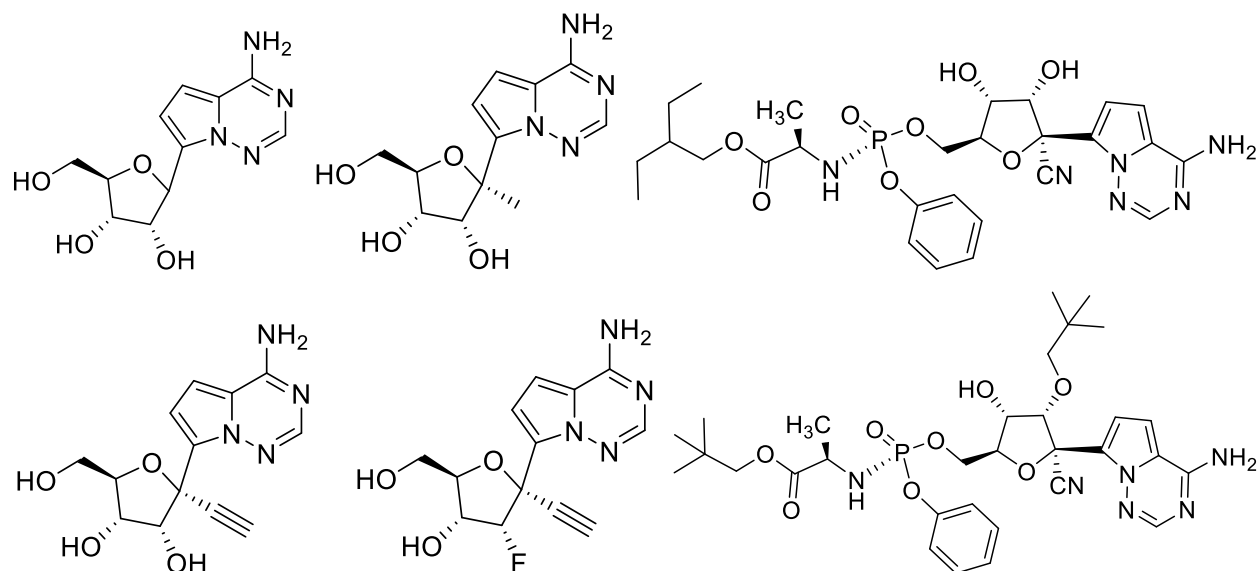


Figure 2: Drug molecules planned for the synthesis & screening of COVID-19

2. Proposed work for the structural modification of Lopinavir:

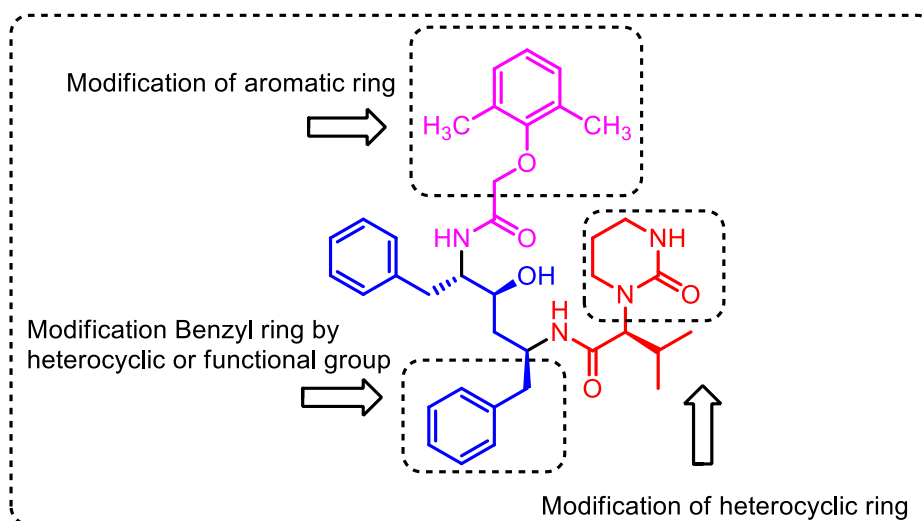


Figure 3: Planned structural modification of Lopinavir drug

3. Proposed chelating metal complexes for screening against COVID 19:

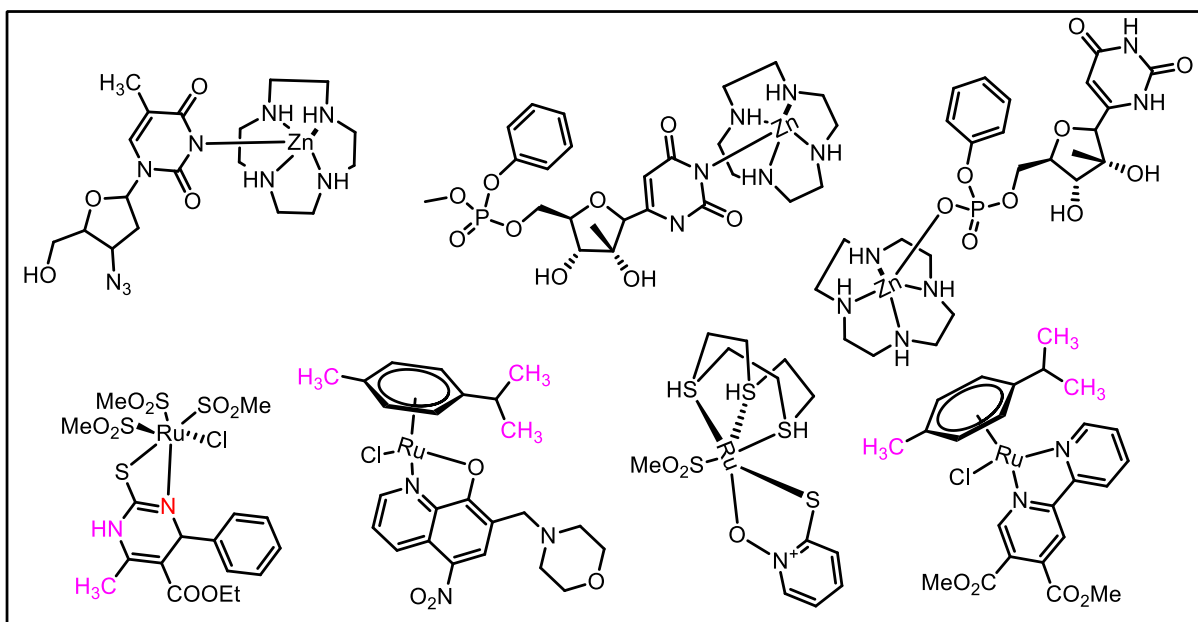


Figure 4: Molecules planned to screen against COVID-19

Expected Outcome: The proposed work is aiming to address some outstanding issues in the synthesis of drug candidates for the treatment of corona virus using a much improved catalytic system.

Expected Time-line: 24 months

Remarks: Funding required Rs. 25 lakhs for 1 year

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