Document prepared by Nerve Center of TFORD, Venture Center, Pune
Task Force on Repurposing of Drugs (TFORD) for COVID19
S&T Core Group on COVID19 constituted by PSA to GoI

Molecule Brief: Remdesivir

Ref: TFORD/MB/003	**Date:** 30 March 2020
About this document: *This document summarizes information available on drug candidates for COVID19. One Molecule Brief document covers one candidate at a time.*	
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1. Summary Information on Remdesivir

Information About the Candidate for Approved Indication(s)	
Common Name of Drug	Remdesivir
Brand Name/Company	Remdesivir (Gilead Sciences Inc.)
Category/ Type	Antiviral
Drug Bank ID/Link	DB14761 https://www.drugbank.ca/drugs/DB14761
Mode of Action	Remdesivir is a prodrug that metabolizes into its active form GS-441524. An adenosine nucleotide analog, GS-441524 inhibits the action of viral RNA polymerase. By incorporating into RNA, additional nucleotides cannot be added, terminating RNA transcription.
Currently Approved for which Indication(s)	<table><tr><th></th><th>Generic name</th><th>Orphan designation</th><th>Designation date</th><th>Designation status</th></tr><tr><td>1</td><td>Remdesivir</td><td>Treatment of coronavirus disease 2019 (COVID-19)</td><td>03/23/2020</td><td>Orphan Drug Approval*</td></tr><tr><td>2</td><td>Remdesivir</td><td>Treatment of Ebola virus disease</td><td>09/18/2015</td><td>Orphan Drug Approval</td></tr></table> * While this approval was granted, Gilead has made the decision to drop its orphan drug designation potential coronavirus treatment. So, at present, Remdesivir is not an approved drug for COVID-19. http://www.pmlive.com/pharma_news/gilead_faces_criticism_over_remdesivirs_orphan_drug_designation_1329985
Approved Dose	Data not available
Route of Administration	IV – Used for Ebola and COVID-19 Trials
Safety Profile of drug (dose range in which it has been tested to be safe in humans)	Data not Available
Adverse events/Side effects reported at the current approved dose	Remdesivir is an experimental medicine that does not have established safety or efficacy for the treatment of any condition https://www.gilead.com/purpose/advancing-global-health/covid-19/about-remdesivir

Reported Drug-Drug Interactions	Data not available
Link to Datasheet	Data not available
Current TRL level of the Drug	TRL > 7 (Ph II/Ph III Clinical Trials)
Has the drug been repurposed for any other indication before?	No
Is the Drug being sold in India?	No
Indian Manufacturer(s)	Cipla is reported to be pursuing it https://www.expresspharma.in/latest-updates/csir-iict-ties-up-with-cipla-to-develop-anti-covid-19-drug/
International Manufacturer(s)	Gilead Sciences https://www.gilead.com/purpose/advancing-global-health/covid-19/increasing-manufacturing-capacity-and-supply-of-remdesivir
Information About the Candidate for COVID-19	
Repurposing Claim	New Indication (COVID-19) + New Dose (not confirmed)
Rationale for Repurposing for COVID-19/MoA?	1) Evidence of inhibition of SARS-CoV-2 in-vitro (details below) 2) Evidence of action against other coronaviruses (MERS and SARS) which are structurally similar to SARS-CoV-2 in-vitro and in-vivo. https://www.ijbs.com/v16p1753.htm) Illustration of possible MoA: https://science.sciencemag.org/content/367/6485/1412
Proposed use as Primary or Adjuvant?	Primary
Pre-Clinical Data available for COVID19	1.Remdesivir effectively inhibits the recently emerged novel coronavirus (SARS-CoV-2) in vitro Remdesivir potently blocked virus infection at low-micromolar concentration and showed high SI. The study shows that Remdesivir functioned at a stage post virus entry which is in agreement with its putative anti-viral mechanism as a nucleotide analogue. 2. Coronavirus Susceptibility to the Antiviral Remdesivir (GS-5734) Is Mediated by the Viral Polymerase and the Proofreading Exoribonuclease. GS-5734 interferes with the nsp12 polymerase even in the setting of intact ExoN proofreading activity and that resistance can be overcome with increased, nontoxic concentrations of GS-5734.
Status of Clinical Trials	• Ongoing (See details below) • 1 of the 4 drugs which are being tested in a WHO global multi-centric trial SOLIDARITY ➢ https://www.sciencemag.org/news/2020/03/who-launches-global-megatrial-four-most-promising-coronavirus-treatments ➢ https://science.sciencemag.org/content/367/6485/1412
Number of Trials	8 ongoing clinical trials: NCT04292730 NCT04292899 NCT04280705 2020-000936-23 NCT04252664 NCT04257656 NCT04302766 NCT04315948
Dose being tested for COVID-19	200 mg loading dose on day 1 is given, followed by 100 mg iv once-daily maintenance doses for 9 days. NCT04252664
Countries where Clinical Trials are being/been done	Data not available
Key Data from Clinical Trials	Data not available
TRL Level for COVID19	TRL > 7 (Ph II /Ph III Clinical Trials)

IP Status	**Pending applications**	• 201948034308 (Divisional to IN319927): **Title:** Compounds For Treating Paramyxoviridae Virus Infections **Assignee:** Gilead Sciences **Priority Date:** 22/07/2010 **Publication date:** 18/10/2019 • 201717012502 **Title:** Methods For The Preparation Of Ribosides **Assignee:** Gilead Sciences **Priority Date:** 29/10/2014 **Publication date:** 14/07/2017
	Approved and Active applications	• IN275967: **Title:** 1-Substituted Carba-Nucleoside Analogs For Antiviral Treatment **Assignee:** Gilead Sciences **Priority date:** 19/12/2008 **Grant date:** 30/09/2016 **Expected expiry date:** 22/04/2029 • IN319927 **Title:** Compounds For Treating Paramyxoviridae Virus Infections **Assignee:** Gilead Sciences **Priority date:** 22/07/2010 **Grant date:** 05/09/2019 **Expected expiry date:** 22/07/2031 • IN332280 **Title:** Compounds For Treating Filoviridae Infections **Assignee:** Gilead Sciences **Priority date:** 29/10/2014 **Grant date:** 18/02/2020 **Expected expiry date:** 29/10/2035
	Expired or Lapsed application	NA
Other Key References	1. WHO: Table of Therapeutics 2. https://www.drugbank.ca/drugs/DB14761 3. https://www.gilead.com/purpose/advancing-global-health/covid-19/ 4. https://www.ncbi.nlm.nih.gov/pubmed/26934220	

2. Background information

About TFORD-COVID19

The Principal Scientific Advisor to the GoI, Dr K VijayRaghavan, has constituted a S&T Core Group on COVID19. Under the aegis of the S&T Core Group on COVID19, a Task Force has been constituted focused on Repurposing of Drugs for COVID19 (in short "TFORD-COVID19"). The Task Force is being coordinated by Dr V Premnath, Head, NCL Innovations at CSIR-NCL and Director, Venture Center and Dr Anurag Agarwal, Director, CSIR-IGIB. The Nerve Center for the Coordination is located be at Venture Center, Pune (located in the campus of CSIR-NCL).

Credits

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