



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 Gol

Molecule Brief: Nigericin

Ref: TFORD/MB/017 **Date:** 12 April 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 Nigericin

Information About the Candidate for Approved Indication(s)	
Common Name of Drug	Nigericin
Brand Name	Not approved, Experimental
Category/ Type	Antibiotic
Drug Bank ID/Link	DB14056 https://www.drugbank.ca/drugs/DB14056
Mode of Action	Nigericin is a toxin derived from <i>Streptomyces hygroscopicus</i> . It is described as a potassium ionophore, which facilitates H ⁺ /K ⁺ anti-transport across cell membranes, thereby activating NLRP3 by causing potassium efflux. Disrupting potassium ion homeostasis may be a potent host pathway to target to quell virus infection
Therapeutic Target	Potassium Ionophore; Activates Inflammasome (NLRP3)
Is action Host or Virus directed?	Host
Currently Approved for which Indication(s)	Not approved, experimental drug with Antibacterial and anti-infective properties
Approved Dose	Data not available
Route of Administration	Data not available
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	Cardiac toxicity is a concern as with all ionophores https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4896753/
Reported Drug-Drug Interactions	Data not available
Link to Datasheet	Data not available
Current TRL level of the Drug	TRL < 5 (Not completed Phase I)
Has the drug been repurposed for any other indication before?	Data not available
Is the Drug being sold in India?	Data not available

Indian Manufacturer(s)	Data not available	
International Manufacturer(s)	Data not available	
Price of the Drug in India	Data not available	
Information about the candidate for COVID19		
Repurposing Claim	New Indication (COVID-19) + New Dose (not confirmed)	
Rationale for Repurposing for COVID19/MoA?	<ul style="list-style-type: none"> Evidence in Influenza- NLRP3 inflammasome activation during influenza viral infection is impaired. An increase in potassium efflux by ATP or Nigericin stimulation rescued this defect. https://www.jimmunol.org/content/jimmunol/early/2012/02/10/jimmunol.1103051.full.pdf Similar compound Carriomycin, a polyether antibiotic being clinically evaluated for COVID-19 (NCT04286503) https://www.cebm.net/covid-19/registered-trials-and-analysis/ 	
Proposed use as Primary or Adjuvant?	Primary	
Pre-Clinical Data available for COVID-19	Not available	
Status of Clinical Trials	No ongoing trials	
Trial Details	Data not available	
Key Data from Clinical Trials	Data not available	
TRL Level for COVID19	TRL < 5 (Not completed Phase I)	
IP Status	Status/ Molecule	Nigericin
	Pending applications	Not Applicable
	Expired or Lapsed application	<p>Applicants in other jurisdictions have chosen not to enter India EP Patent: 0294538 Title: Use Of Nigericin For The Production Of A Medicament For The Treatment Of Viral Diseases Assignee: Pharmachim Filing Date: 25/01/1988 Legal Status: Expired in EP and Not Entered in India EP Patent: 0324390 Title: Nigericin Derivatives, Method For Their Preparation, Compositions Containing Them And Use Of These Compositions Applicant: Hoechst Ag Filing Date: 07/01/1989 Publication Date: 29/07/1992 Legal Status: Withdrawn in EP and Not Entered in India EP Patent: 0336248 Title: Nigericin Derivatives, Substituted At The F-Ring, Process For Their Preparation, Agents Containing Them, And Their Use Applicant: Hoechst Ag Filing Date: 25/03/1989 Publication Date: 11/10/1989 Legal Status: Withdrawn in EP and Not Entered in India EP Patent 0356944 Title: Nigericin Derivatives, Method For Their Preparation, Compositions Containing Them And Use Of These Compositions Filing Date: 26/08/1989 Publication Date: 07/03/1990 Legal Status: Withdrawn in EP and Not Entered in India Applicant: Hoechst Ag</p>

	<p>EP Patent: 0358177 Title: Medicine With A Synergistic Antimycotic And Antiviral Activity Applicant: Hoechst Ag Filing Date: 06/09/1989 Publication Date: 14/03/1990 Legal Status: Withdrawn in EP and Not Entered in India</p> <p>WO2012040841 Title: Use Of Nigericin To Treat And Prevent Vaccinia Virus Infections Applicant: Her Majesty The Queen In Right Of Canada As Represented By The Minister Of Health Filing Date: 16/09/2011 Publication Date: 05/04/2012 Legal Status: Not Entered in India CN Patent No: 103540547 (No.pdf available on WIPO site)</p> <p>Title: Strain For Producing Nigericin Applicant: XIAMEN UNIVERSITY Filing Date: 21/03/2011 Publication Date: 09/03/2016 Legal Status: Estimated Expiry 21/03/2031-Not Entered in India</p> <p>US Patent: 7544712 Title: Treatment Of Coronavirus Infection Patentee: Nat Health Res Insitutes (Taiwan) Filing Date: 28/05/2004 Issued Date: 09/06/2009 Legal Status: Patent Expired in USA. Not Entered in India</p>
Other Key References	<ol style="list-style-type: none"> 1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4896753/ 2. https://www.biorxiv.org/content/10.1101/2020.01.21.914929v1

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 at Venture Center, Pune (located in the campus of CSIR-NCL).

Credits

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