Outcome activity between Vikrama Simhapuri University, Nellore and Damien Foundation India Trust

Dr. Uday Sankar Allam, Assistant Professor in Department of Biotechnology has been involved in collaborative research since 2018. VSU in collaboration with DFIT has published the following research articles and also submitted two research grants to the national funding agencies

S.No	Details of collaborative activity	Year
1	Prasad, P. G., Jasmine, M. S., Deepthi, K., & Allam, U. S. (2019). Analysis of drug resistance mutations in pulmonary Mycobacterium tuberculosis isolates in the Southern coastal region of Andhra Pradesh, India. *Brazilian Journal of Infectious Diseases*, *23*, 281-290.	2019
2	Sekhar, T., Thriveni, P., Ramesh, K., Giri Prasad, P., Srihari, I., Gorityala, N., ... & Sankar Allam, U. (2020). Green synthesis, antitubercular evaluation, and molecular docking studies of ethyl 3, 5-dicyano-6-oxo-2, 4-diarylpiperidine-3-carboxylate derivatives. Medicinal Chemistry Research, 29, 748-758.	2020
3	Polu, V. G. P., kanta Kota, N. M., Karumanchi, D., Basireddy, S. R., Munagapati, S., Mugudalabetta, S. K., ... & Allam, U. S. (2022). Evaluation of detection of severe acute respiratory syndrome coronavirus-2 by chip-based real-time polymerase chain reaction test (truenat™ beta CoV) in multi-sample pools. International Journal of Academic Medicine, 8(3), 123.	2022
4	Health Camp at Indiramma Colony by VSU NSS Cell & Damien Foundation Urban Leprosy & TB Research Centre	2018
5	Dr.Uday Sankar Allam, Department of Biotechnology, Vikrama Simhapuri University has submitted collaborative research proposals to the funding agencies like Department of Biotechnology (DBT), Govt. of India, New Delhi and Department of Science & Technology (DST). Govt. of India, New Delhi	

Medicinal Chemistry Research
https://doi.org/10.1007/s00044-020-02519-2

MEDICINAL CHEMISTRY RESEARCH

ORIGINAL RESEARCH

Green synthesis, antitubercular evaluation, and molecular docking studies of ethyl 3,5-dicyano-6-oxo-2,4-diarylpiperidine-3-carboxylate derivatives

Thuraka Sekhar[1] · Pinnu Thriveni[1] · Kolluri Ramesh[1] · Polu Giri Prasad[2] · Indla Srihari[3] · Neelima Gorityala[4] · Someswar Rao Sagurthi[4] · Uday Sankar Allam[2]

Received: 26 September 2019 / Accepted: 1 February 2020

Abstract
A simple and environment friendly one-pot synthesis of ethyl 3,5-dicyano-6-oxo-2,4-diarylpiperidine-3-carboxylate derivatives from aryl aldehydes, ethyl cyanoacetate, and ammonium acetate was developed in aqueous medium without using a catalyst. The significant features of this method are easy, inexpensive experimental procedures with short reaction time and high yield. The use of water as the solvent without catalyst makes the reaction meritorious and further fulfilled green chemistry protocols. The compounds were screened for antibacterial activity against Gram-positive bacteria (*Staphylococcus aureus* 25923) and Gram-negative bacteria (*Escherichia coli* ATCC25922) by disk diffusion method. Compounds **4f**, **4h**, and **4i** showed moderate antibacterial activity *S. aureus*. Intriguingly, compound **4g** exhibited very good antibacterial activity against *E. coli*. Antitubercular activity assay indicates that the compounds **4(a–c)** exhibited activity with varying MICs against *mycobacterium tuberculosis* H37RV control strain and multidrug-resistant tuberculosis (MDR-TB) clinical isolate. Among the three tested compounds, **4c** showed an equipotent antitubercular activity against H37Rv and MDR-TB clinical isolates with MIC 3.13 µg/ml. Further, docking analysis of synthesized piperidinone derivatives with acetate kinase protein reported that these compounds interact effectively with the catalytic residues that are in the vicinity of ATP binding and active sites facilitating inhibition of enzyme function. Thus these derivatives can be promising compounds for antitubercular activity to combat tuberculosis.

Keywords Antitubercular activity · Molecular docking studies · One-pot synthesis · Piperidinones

Introduction

The synthesis of heterocyclic compounds has been an important area of study since long time, as these molecules are usually used in various fields such as agriculture, medicine, pharmacy, and contribute to potent and selective drugs (Varma 1996). The development of an environmentally benign and viable procedure for the synthesis of organic compounds is one of the important goals to be achieved by organic chemists (Ali et al. 2015; Butler and Coyne 2010; Rao et al. 2015). Synthesizing novel bioactive compounds with minimum number of synthetic steps and in a short time is a significant challenge to the scientists (Ali et al. 2012; Kaur et al. 2015; Saleem et al. 2013). One-pot reactions have become popular in organic synthesis and combinatorial chemistry because of their straight forwardness, less reaction time, use of green solvent, fewer byproducts, simple experimentation, and high yield of

Supplementary information The online version of this article (https://doi.org/10.1007/s00044-020-02519-2) contains supplementary material, which is available to authorized users.

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Published online: 26 February 2020

Original Article

Evaluation of detection of severe acute respiratory syndrome coronavirus-2 by chip-based real-time polymerase chain reaction test (truenat™ beta CoV) in multi-sample pools

Venkata Giri Prasad Polu[1], Neela Mani kanta Kota[2], Deepthi Karumanchi[3], Sreekanth Reddy Basireddy[4], Sandhya Munagapati[5], Shiva Kumar Mugudalabetta[1], Venkata Prasad Ganta[6], Uday Sankar Allam[7]

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Abstract

Introduction: Systematic testing for Severe Acute Respiratory Syndrome CoronaVirus-2 (SARS-CoV-2) using molecular diagnostic tools to identify individuals with coronavirus disease 2019 (COVID-19) infection, and tracing their primary and secondary contacts is important to curb its spread. With resource limitations on testing individual samples, testing of pooled samples provides alternative approach to increase testing capacity. Present aimed at assessing the detection of SARS-CoV-2 RNA in pooled samples using chip-based real-time polymerase chain reaction Test (Truenat™ Beta CoV).

Materials and Methods: Pooled sample size of five was used from laboratory confirmed COVID-19 positive and negative samples. SARS-CoV-2 positive nasopharyngeal specimens of known samples from high, medium, low, and very low viral load were mixed with SARS-CoV-2 negative nasopharyngeal specimens of known samples in 1:4 ratio, followed by analysis using Truenat. Furthermore, each sample in that pool was tested individually. Pooled sample testing was also done on the samples of unknown status.

Results: The results of the present study showed cycle threshold (Ct) values of pooled sample with SARS-CoV-2 positive RNA of high, medium, low, and very low viral load were 16.8, 24.22, 28.2, and 33.43, compared to Ct values of individual samples of 16.43, 22.0, 28.00, and 33.00, respectively.

Conclusion: These results suggest that the Ct values of pooled samples were in agreement with Ct values of individual samples indicating the validity of pooled sample testing for screening SARS-CoV-2 using Truenat.

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The Brazilian Journal of
INFECTIOUS DISEASES

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Original article

Analysis of drug resistance mutations in pulmonary *Mycobacterium tuberculosis* isolates in the Southern coastal region of Andhra Pradesh, India

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Keywords:
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MTBDRplus assay
Mutations
Molecular detection

ABSTRACT

Purpose and objectives: Detection of drug resistance plays a crucial role in tuberculosis (TB) treatment and prevention of *Mycobacterium tuberculosis* (MTB) transmission. The aim of this study was to determine the levels and patterns of resistance of MTB isolates to two key anti-TB drugs (rifampicin, RIF and isoniazid, INH) and the type of mutations in drug resistance genes (*rpoB*, *katG* and *inhA*) of the isolates at the southern coastal region of Andhra Pradesh, India, using commercially available GenoType MTBDRplus assay under the Revised National TB Control Program.

Methods: GenoType MTBDRplus assay was performed on 2859 sputum smear-positive samples and the mutations in the genes responsible for resistance (*rpoB*, *katG* and *inhA*) were analyzed.

Results: Among the line probe assay (LPA) valid isolates (2894), 1990 (68.76%) were drug susceptible, 437 (15.13%) were INH monoresistant, 104 (3.59%) were RIF monoresistant, and 363 (12.54%) were multidrug resistant. Codon 531 of *rpoB* gene and codon 315 of *katG* gene were found to have the highest mutation frequency for RIF resistance (270/467; 57.81%) and INH resistance (501/800; 62.62%), respectively. The RIF resistant *rpoB* mutations observed in the samples were S531 L (57.81%), H526Y (8.56%), D516 V (6.42%), and H526D (6.20%). Mutations in *inhA* promoter were found in 24.75% INH resistant isolates with C15 T being the most common (85.85%). The turnaround times of the LPA test were from 48 to72 h.

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https://doi.org/10.1016/j.bjid.2019.07.002

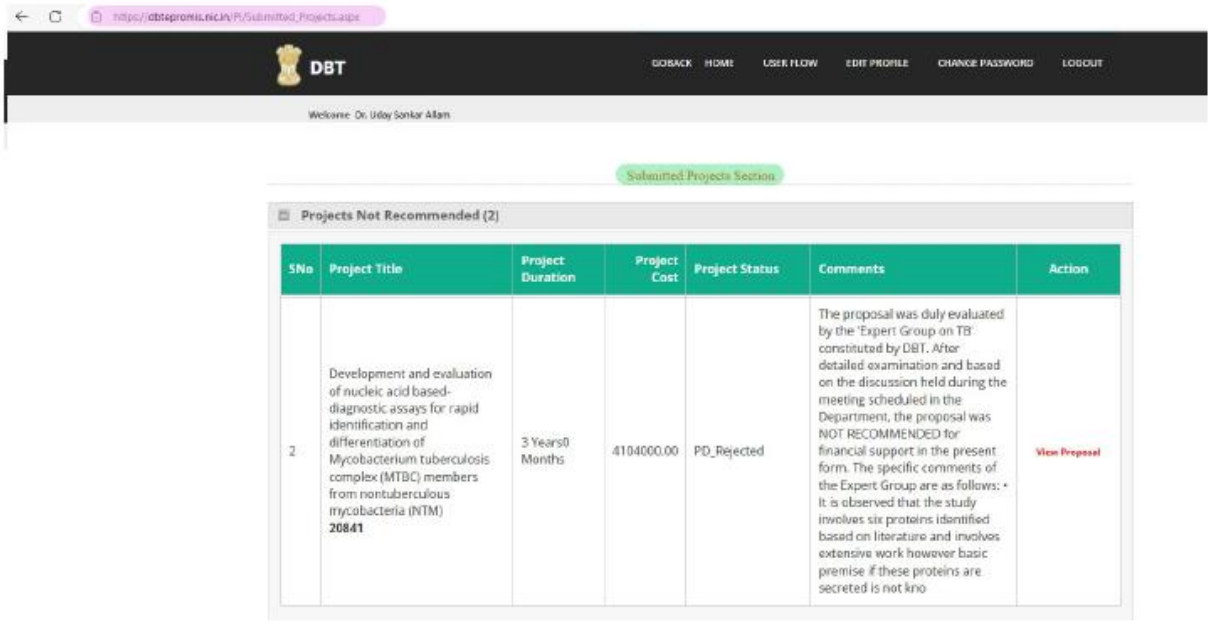
Health camp at Indiramma colony
(21-08-2018)

VSU NSS Cell in association with Damien Foundation Urban Leprosy & TB Research Centre conducted a health camp at Indiramma colony, Padarupalli (PO), SPS Nellore. Damien Foundation Urban Leprosy & TB Research Centre is run by the renowned NGO Damien Foundation India Trust (DFIT). A door to door awareness was created about the medical camp a day before the camp by 38 VSU NSS volunteers. Nearly 126 residents of Indiramma colony have benefitted from this medical camp. Consultation and medicines were given free of cost by DFIT. DFIT Doctor, Dr. Sukruthi, Shri M. Thyagarajan, AO, Leprosy hospital staff and NSS programme coordinator, Dr. Uday Sankar Allam participated in the medical camp.

Health practitioner performing checkup and distributing medicines

Dr.Uday Sankar Allam, Department of Biotechnology, Vikrama Simhapuri University has submitted collaborative research proposals to the funding agencies like Department of Biotechnology (DBT), Govt. of India, New Delhi and Department of Science & Technology (DST). Govt. of India, New Delhi

Evidence for Research proposal submitted to Department of Biotechnology (DBT)



DBT

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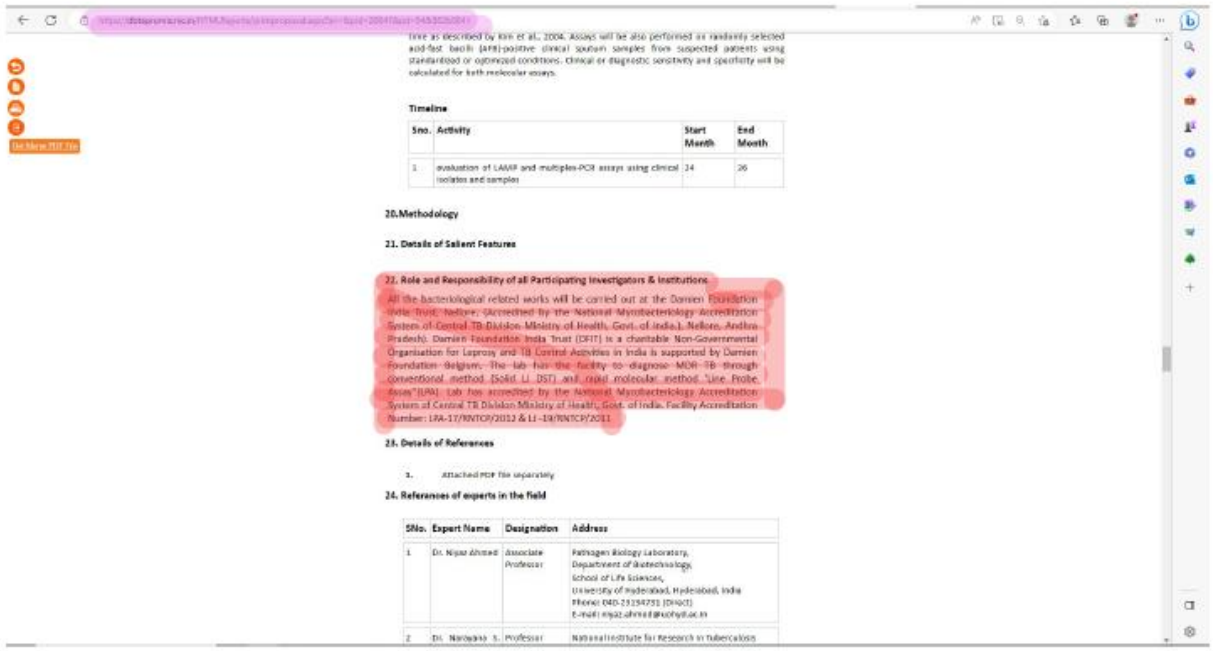
Welcome Dr. Uday Sankar Allam

Submitted Projects Section

Projects Not Recommended (2)

SNo	Project Title	Project Duration	Project Cost	Project Status	Comments	Action
2	Development and evaluation of nucleic acid based-diagnostic assays for rapid identification and differentiation of Mycobacterium tuberculosis complex (MTBC) members from nontuberculous mycobacteria (NTM) **20841**	3 Years0 Months	4104000.00	PD_Rejected	The proposal was duly evaluated by the 'Expert Group on TB' constituted by DBT. After detailed examination and based on the discussion held during the meeting scheduled in the Department, the proposal was NOT RECOMMENDED for financial support in the present form. The specific comments of the Expert Group are as follows: • It is observed that the study involves six proteins identified based on literature and involves extensive work however basic premise if these proteins are secreted is not kno	View Proposal



Timeline

Sno.	Activity	Start Month	End Month
1	evaluation of LAMP and multiplex-PCR assays using clinical isolates and samples	24	26

20.Methodology

21. Details of Salient Features

22. Role and Responsibility of all Participating Investigators & Institutions

All the bacteriological related works will be carried out at the Damien Foundation India Trust, Nellore, (Accredited by the National Mycobacteriology Accreditation System of Central TB Division Ministry of Health, Govt. of India.), Nellore, Andhra Pradesh). Damien Foundation India Trust (DFIT) is a charitable Non-Governmental Organisation for Leprosy and TB Control Activities in India is supported by Damien Foundation Belgium. The lab has the facility to diagnose MDR TB through conventional method (Solid LJ DST) and rapid molecular method "Line Probe Assay"(LPA). Lab has accredited by the National Mycobacteriology Accreditation System of Central TB Division Ministry of Health, Govt. of India. Facility Accreditation Number: LPA-17/RNTCP/2013 & LJ -19/RNTCP/2011

23. Details of References

1. Attached PDF file separately

24. References of experts in the field

SNo.	Expert Name	Designation	Address
1	Dr. Nijaz Ahmed	Associate Professor	Pathogen Biology Laboratory, Department of Biotechnology, School of Life Sciences, University of Hyderabad, Hyderabad, India Phone: 040-23134731 (Direct) E-mail: nijaz.ahmed@uohyd.ac.in
2	Dr. Narayana S.	Professor	National Institute for Research in Tuberculosis

Department of Science & Technology (DST). Govt. of India, New Delhi