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Adarsh

App. No. MED/2017/76

No. BT/PR25123/NER/95/1027/2017
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY
(NER-BPMC)

Block 2, 6-8th Floors
CGO Complex, Lodhi Road,
New Delhi- 110 003
Dated: 19/09/2018

ORDER

Sanction of the President is hereby accorded, under Rule 18 of the Delegation of Financial Powers Rules, 1978, for the implementation of the project entitled: **"Drug discovery approaches for the effective control of tuberculosis – target based virtual screening and whole cell screening of medicinal plants"** for a period of 3 Year 0 Month at a total cost of Rs. **11888800** (Rupees One Crores Eighteen Lakhs Eighty Eight Thousand Eight Hundred Only) on the terms and conditions detailed here under:-

2 The Project :

2.1 Title : "Drug discovery approaches for the effective control of tuberculosis – target based virtual screening and whole cell screening of medicinal plants"

Details of the Investigators:

2.2

Project Coordinator

Dr. Anupam Das Talukdar
Assistant Professor
Department of Life Science & Bioinformatics.
Assam University
Department of Life Science & Bioinformatics,
Assam University Silchar, Silchar, Assam, 788011

Principal Investigators:

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Dr. Anupam Das Talukdar
Assistant Professor
Department of Life Science &
Bioinformatics.
Assam University
Department of Life Science &
Bioinformatics,
Assam University Silchar,
Silchar, Assam, 788011

Dr. Garima Khare
Assistant Professor
Biochemistry
University of Delhi, South Campus
Room No. 103, Department of
Biochemistry, B.K. Bachhawat
Block, University of Delhi South
Campus, Benito Juarez Road, New
Delhi, New Delhi, Delhi, 110021

Dr. Pankaj Chetia
Assistant Professor
Life Sciences
Dibrugarh University
Dibrugarh, Assam, India,
Dibrugarh, Assam, 786004

CO-PI:

Prof. Manabendra Dutta Choudhury
Professor
Life Science and Bioinformatics
Assam University
Assam University, Silchar, , Assam, Silchar -
788011, Assam

Dr. Devid Kardong
Associate Professor
Life Sciences
Dibrugarh University
Department Of Life Sciences
Dibrugarh University
P.O. Rajabgheta
Dibrugarh (Assam), Dibrugarh - 786004,
Assam

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2.3 Objectives:

Overall Objectives:

1. The overall objective of this project is to identify novel drugs against tuberculosis by using the approach of virtual screening and whole cell phenotypic screening method. The major objectives are as follows:
2. 1. Structure based virtual screening – important drug targets of *M. tuberculosis* will be identified and their gene knockouts will be generated. The validation of these targets will be carried out by using the gene knockouts in guinea pigs. Further, either by using the PDB structure or a comparative homology model, structure based in silico screening will be performed. The potent hits will be evaluated for their potential to inhibit the growth of *M. tuberculosis* in broth culture, inside macrophages and in experimental mouse model.
3. 2. Whole cell based screening will be carried out against the growth of *M. tuberculosis* in broth culture by using the extracts of various medicinal plants (from NER). Cytotoxicity assays will also be performed. The extracts displaying inhibition of the mycobacterial growth and not showing significant cytotoxicity against mammalian cell lines will be further subjected to isolation of bioactive molecules to identify the inhibitory scaffold. The potent hits will be evaluated for their potential to inhibit the growth of *M. tuberculosis* in broth culture, inside macrophages and in experimental mouse model.

Institute wise Objectives:

Assam University

1. Medicinal plant selection, extraction and Isolation.
2. Purification of the inhibitory extracts to isolate the bioactive molecule

Dibrugarh University

1. Chemogenomics based virtual high-throughput screening of various libraries for anti-tubercular activity.
2. Molecular dynamics simulation and QM-MM based screening of ligand-target interaction.
3. ADME-Tox and QSAR based studies for screening most potent lead molecule.

University of Delhi, South Campus

1. Structure based drug design – Target Selection:
(i) Development of *M. tuberculosis* deletion mutants;
(ii) In-vitro growth of various *M. tuberculosis* deletion mutants;
(iii) Intracellular survival of mycobacterial strains in THP-1 macrophages;
(iv) Studies on the survival of mycobacterial strains in guinea pigs
(v) Survival studies;
(vi) Evaluation of the compounds against mycobacteria
2. Whole cell based phenotypic screening:
(i) To perform the preliminary screening of the medicinal plants extracts against the growth of *M. tuberculosis* in-vitro broth culture;
(ii) To assess the cytotoxicity of the promising compounds and evaluation of their inhibitory potential against the intracellular growth of the mycobacteria inside macrophages;
(iii) To evaluate the efficacy of the most potent compounds in mice model of experimental TB
3. Training component and capacity building

2.4 Time Schedule:

The duration of the project is 3 Year 0 Month from the date of this sanction order.

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2.5 Project Cost:

The total cost of the project is Rs. **11888800/-** (Rupees One Crores Eighteen Lakhs Eighty Eight Thousand Eight Hundred Only) as per details given below :

Institute	Year I	Year II	Year III	Total Cost(Rs.)
Assam University	2169600	869600	769600	3808800
2. Dibrugarh University	2870000	530000	569600	3969600
3. University of Delhi, South Campus	1436800	1336800	1336800	4110400
Total (Rs.)	6476400	2736400	2676000	11888800

Institute wise details are:

Budget Head	Year I	Year II	Year III	Total(Rs.)
1. University of Delhi, South Campus				
Manpower	436800.00	436800.00	436800.00	1310400.00
Consumables	800000.00	700000.00	700000.00	2200000.00
Overhead	100000.00	100000.00	100000.00	300000.00
Contingency	50000.00	50000.00	50000.00	150000.00
Travel	50000.00	50000.00	50000.00	150000.00
Total (Rs.)	1436800.00	1336800.00	1336800.00	4110400.00
2. Dibrugarh University				
Equipment	2340000.00			2340000.00
Manpower	330000.00	330000.00	369600.00	1029600.00
Overhead	100000.00	100000.00	100000.00	300000.00
Contingency	50000.00	50000.00	50000.00	150000.00
Travel	50000.00	50000.00	50000.00	150000.00
Total (Rs.)	2870000.00	530000.00	569600.00	3969600.00

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3. Assam University				
Equipment	1300000.00			1300000.00
Manpower	369600.00	369600.00	369600.00	1108800.00
Overhead	100000.00	100000.00	100000.00	300000.00
Consumables	300000.00	300000.00	200000.00	800000.00
Contingency	50000.00	50000.00	50000.00	150000.00
Travel	50000.00	50000.00	50000.00	150000.00
Total (Rs.)	2169600.00	869600.00	769600.00	3808800.00

2.6 Equipment:

The details of the equipment sanctioned for the implementation of the project at
Annexure-I

2.7 Manpower:

The details of the manpower sanctioned for the implementation of the project at
Annexure-II

3. Head of Account:

The **Non-Recurring** expenditure involved is debitable to:

Demand No. 85	Department of Biotechnology
3425	Other Scientific Research 2018-2019
3425.60	Others (Sub Major Head)
3425.60.200	Assistance to other Scientific Bodies (Minor Head)
3425.60.200.29	Biotechnology Research and Development
3425.60.200.29.17	Assistance for Research and Development
3425.60.200.29.17.35	Grants for creation of capital assets

The **Recurring** expenditure involved is debitable to:

Demand No. 85	Department of Biotechnology
3425	Other Scientific Research 2018-2019
3425.60	Others (Sub Major Head)
3425.60.200	Assistance to other Scientific Bodies (Minor Head)
3425.60.200.29	Biotechnology Research and Development
3425.60.200.29.17	Assistance for Research and Development
3425.60.200.29.17.31	Grants-in-Aid General

4. Terms & Conditions:

Additional Terms and Conditions, specific for Twinning R and D program for NER

- a. Both NER and Rest of India (RoI), Institutions scientists should work together for the objectives stated in the sanction of the project and any deviation from this would attract closure of the project at any point of time.
- b. In the project review meetings, both the PIs from NER and RoI Institutions should participate and make presentation.
- c. The outcomes of the project such as research papers, patents, copy rights etc. should be made jointly.
- d. The NER Scientists are to be trained at the collaborating institute appropriately to empower the NER Scientists.
- e. The project personal such as Research Associate, JRF or SRF, Research Assistant are also to be trained at least once in the collaborating national institute.
- f. The collaborating institute scientist should visit NER institutions more frequently to guide NER scientists in design and conduct of experiments.

4.1 The other terms and conditions governing this sanction are attached at Annexure- III.

4.2A Memorandum of Agreement (MoA) will be signed between the Department of Biotechnology and the grantee institution on Non-Judicial stamp paper Rs. 100/- in the enclosed format and the second release/installment will be made only after signing of MoA by the grantee institutions and its acceptance by DBT. In case of NGO or Private Institution, MOA signed is mandatory first release. A format of the MoA is enclosed in Annexure-IV

4.3 The Institute/Agency will keep the whole of the grant in a Bank Account earning interest, and the interest so earned should be reported to DBT in the Utilisation Certificate and Statement of Expenditure. The Interest so earned will be treated as created to the institute/Agency and shall be adjusted towards further installment of the grant and or at the time of Final Settlement of Accounts.

5.No International Travel will be undertaken from the sanctioned project grant unless specified otherwise.

6.The Comptroller, University of Delhi, South Campus, South Delhi, Delhi and The Registrar, Assam University, Silchar, Assam and The Registrar, Dibrugarh University, Dibrugarh, Assam would be responsible for submission of Statements of Expenditure (SoE), utilization certificates (UC), Assets Certificates, Manpower staffing & expenditure details in prescribed DBT formats to DBT in respect of grants released in this project from time to time.

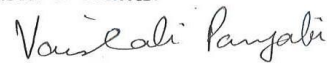
7.PI's of DBT sponsored projects can consider appointment of JRF from Category-II merit list of DBT-BET exam so that candidates can be paid fellowships at par with NET/GATE/BET qualified candidates as per DST OM No. A.SR/S9/Z-09/2012 dated on 21 Oct 2014. However, there is no compulsion on PI's to select candidates for JRF in their projects from Category-II of DBT-BET.

8.As per Rule 236 (1) of GFR 2017, the accounts of all Grantee Institutions or Organisations shall be open to inspection by the sanctioning authority and audit, both by the Comptroller and Auditor General of India under the provision of CAG(DPC) Act 1971 and internal audit by the Principal Accounts Office of the Ministry or Department, whenever the Institution or Organisation is called upon to do so.

9.If the Research Project involves biological resource, the obligations under the Biological Diversity Act 2002 as applicable shall be complied with by the Project Investigator, the details of such obligations can be accessed at www.nbaindia.org

10.This issues under the power delegated to this Department and with the concurrence of IFD vide their SAN No.102/IFD/SAN/2321/2018-2019 dated September, 17 2018.

11.This sanction order has been noted at serial no.274-275 in the Register of Grants.


(Dr. Vaishali Panjabi)
Scientist 'E'

To,
The Pay & Accounts Officer,
Department of Biotechnology,
New Delhi - 110 003.

Copy to:

- 1 The Principal Director of Audit (Scientific Departments), DACR Building, New Delhi- 110 002.
- 2 DR. ANUPAM DAS TALUKDAR(Project Co-ordinator), Ethnobotany and Medicinal Plant Research Laboratory
Deptt. of Life Science & Bioinformatics
Assam
- 3 The Comptroller, University of Delhi, South Campus, New Delhi, Delhi 110021,
- 4 The Registrar, Assam University, Silchar - 788011, Assam
- 5 The Registrar, Dibrugarh University, Dibrugarh - 786004, Assam
- 6 Dr. Anupam Das Talukdar, Assistant Professor, Department of Life Science & Bioinformatics., Assam University , Silchar - 788011, Assam
- 7 Dr. Devid Kardong, Associate Professor, Life Sciences, Dibrugarh University, Department Of Life Sciences Dibrugarh University P.O. Rajabhetta, Dibrugarh - 786004, Assam
- 8 Dr. Garima Khare, Assistant Professor, Biochemistry, University of Delhi, South Campus, Room No. 103, Department of Biochemistry, B.K. Bachhawat Block, University of Delhi South Campus, Benito Juarez Road, New Delhi, New Delhi - 110021, Delhi
- 9 Dr. Pankaj Chetia, Assistant Professor, Life Sciences, Dibrugarh University, Dibrugarh, Assam, India, Dibrugarh - 786004, Assam
- 10 Prof. Manabendra Dutta Choudhury, Professor, Life Science and Bioinformatics, Assam University , Assam University, Silchar, , Assam, Silchar - 788011, Assam
- 11 Cash Section, DBT (2 copies).
- 12 Sanction Folder.
- 13 File Copy.


(Dr. Vaishali Panjabi)
Scientist 'E'

Annexure -I

Details of the Equipment sanctioned for the implementation of the project titled "Drug discovery approaches for the effective control of tuberculosis – target based virtual screening and whole cell screening of medicinal plants":

Dibrugarh University			
SNo.	Name of Equipment	No.	Cost(Rs.)
1.	Drug Designing Software	1	2340000.00
Total			2340000.00
Assam University			
SNo.	Name of Equipment	No.	Cost(Rs.)
1.	Lyophilizer	1	300000.00
2.	UV double beam Spectrophotometer	1	600000.00
3.	Ultra Sonicator Bath	1	400000.00
Total			1300000.00

Vaishali Panjabi
(Dr. Vaishali Panjabi)
Scientist 'E'

Annexure -II

Details of the manpower sanctioned for the implementation of the project titled "**Drug discovery approaches for the effective control of tuberculosis – target based virtual screening and whole cell screening of medicinal plants**":

Head	No. of Position	Year I	Year II	Year III	Total (Rs.)
1. Assam University					
Senior Research Fellow srf	1	369600.00	369600.00	369600.00	1108800.00
Total(Rs.)		369600.00	369600.00	369600.00	1108800.00
2. Dibrugarh University					
Junior Research Fellow 25000+10%HRA	1	330000.00	330000.00		660000.00
Senior Research Fellow SRF	1			369600.00	369600.00
Total(Rs.)		330000.00	330000.00	369600.00	1029600.00
3. University of Delhi, South Campus					
Senior Research Fellow SRF	1	436800.00	436800.00	436800.00	1310400.00
Total(Rs.)		436800.00	436800.00	436800.00	1310400.00

Emoluments detail of research personal(s) mentioned in table(s) of Annexure-II shall be applicable only if candidate(s) met educational qualification and eligibility criteria as per DST OM No.SR/S9/Z-09/2012 dated 21.10.2014.

Vaishali Panjabi
(Dr. Vaishali Panjabi)
Scientist 'E'

