

MEMORANDUM OF UNDERSTANDING
BETWEEN
DRUGS FOR NEGLECTED DISEASES INITIATIVE (DNDi Geneva);
DRUGS FOR NEGLECTED DISEASES INITIATIVE INDIA FOUNDATION (DNDi India)
AND
UNIVERSITY OF LUCKNOW, LUCKNOW, INDIA
(hereinafter the “MoU”)

This MoU is made at Lucknow on 08th February 2023 between **Drugs for Neglected Diseases initiative (DNDi)**, a collaborative, international not-for-profit drug research and development organization developing new treatments for neglected people, having its registered office at 15, Chemin Camille-Vidart, 1202, Geneva, Switzerland ("**DNDi Geneva**"); **DNDi Drugs For Neglected Diseases Initiative India Foundation**, having its registered office at PHD Chamber, 3rd Floor 4/2 Siri Institutional Area, August Kranti Marg New Delhi South Delhi DL IN 110016 ("**DNDi India**")

(both collectively "**DNDi**")

and

The University of Lucknow, Lucknow State University covered by Uttar Pradesh University Act 1973 (the "**University**"), having its registered office at University of Lucknow, University Road, Lucknow. **The University of Lucknow (University)** is a public state university based in Lucknow. Founded in 1920, is one of the oldest government owned institutions of higher education in India. The University has a student centric research-based education with emphasis on innovation to enable young minds to embark upon the journey of intellectual, social and spiritual transformation. The Department of Chemistry established in the year 1920, has a great tradition of research. The faculty members have been working on various scientific areas and therefore the Department has a wide variety of research areas like physical chemistry, inorganic chemistry, and organic chemistry. The Department of Chemistry has made noteworthy and innovative contributions in the fields of Synthetic Organic Chemistry, Functional Materials Designing and Crystallography, Inorganic and Physical-organic chemistry, Supramolecular Chemistry, Medicinal and Computational Chemistry, Drug design and formulations, etc. The faculty members are also involved in research and innovations in interdisciplinary and multi-disciplinary fields like medicinal chemistry, materials chemistry, crystal engineering, solar-cells design, and computational and theoretical chemistry. The pioneering works of the eminent scientists have been highlighted and published in renowned journals of national and international levels.

hereinafter referred to individually as "**Party**" and collectively as "**Parties**"

1. OBJECTIVE:

The objective of this MoU between the Parties is to engage in a collaboration wherein **DNDi** is exploring the concept of open-source drug discovery by contemplating the implementation of a student crowd sourcing model for a chemistry project as further detailed in Annex 1 (the "**Project**"). The University has expressed its willingness to participate in the Project.

This Project will support in the development of new drugs for the treatment of neglected tropical and viral diseases, which will eventually have a societal benefit. It also contributes to skill enhancement of the participating students.

2. ROLES:

2.1 **DNDi Geneva** will undertake the following activities:

- i. Provide the chemical structure designs to the University for the chemistry students.
- ii. Test the compounds and analogue(s) provided by the University, against the infectious disease agent(s) of relevance.
- iii. Provide the University and its students with the Results of the compound's testing (as defined in §2.3).

2.2 **DNDi India** will undertake the following activities:

- i. Coordinate the Project.
- ii. Provide, at DNDi India's sole discretion and upon prior written request and approval, certain starting materials and/or chemical intermediates required for the Project or reimburse the costs of such materials and/or chemical intermediates in case these are purchased locally upon DNDi India's prior written approval.

2.3 The **University** will undertake the following activities:

- i. Engage to work on the Project and provide manpower, equipment, chemicals, infrastructure and all other support as required for fulfilment of the objective of this MoU.
- ii. Allow its chemistry students to synthesize compounds designed by DNDi Geneva's medicinal chemists and/or to design and synthesize analogue(s) as part of a practical work exercise and
- iii. Provide the synthesized compounds and analogue(s) to DNDi Geneva for testing against the infectious diseases of relevance.
- iv. Make the samples of the compounds and analogues synthesized by its student(s) under this Project available to anyone who requests them free of charge and solely for research and non-commercial purposes, provided that there shall be no requirement to produce additional quantities, and that the requesting organization covers the costs of shipment. The University shall not engage in any profit-making or commercial use of the Results (as defined below).
- v. Use reasonable endeavours to ensure that the students' work on the Project is carried out in accordance with accepted scientific principles and standards but makes no representation or warranty that any results will be fit for any particular purpose and accepts no responsibility for any use which may be made of any results, materials, method or process arising from the Project.
- vi. Share a Progress Report in the format and frequency as agreed between the parties.

2.3 **All Parties agree** on the open-source nature of this Project towards the development of new treatments for infectious diseases of global health relevance and the collective intent that the results of the students' work and of DNDi Geneva's testing, including all data, analysis of data, chemical structures, methods, processes, inventions, know-how, records, documents, reports and other information and materials whatsoever generated under this MoU ("**Results**"), be made available to anyone to use for any non-commercial purpose. Accordingly, DNDi and the University, represent, warrant and covenant that they will not seek or obtain protection of any intellectual property rights over the Results. The Results will be placed in the public domain by way of publication, as described in the attached application form (Annex 2).

2.4 The activities listed in Section 2.2 will be conducted under the University's exclusive responsibility.

3. FUNDING:

Under this MoU, unless expressly stated otherwise, the University will bear its respective costs, if any, relating to the activities. This MoU does not include the reimbursement of funds between the Parties.

4. EFFECTIVE DATE

This MoU shall be in force from 08 February 2023 to 07 February 2026.

5. MISCELLANEOUS:

- i. Termination. Any Party may terminate this MoU at any time upon sixty (60) days' prior written notice to the other Parties. Sections 2.3 and 5 shall survive the expiration or termination of this MoU.
- ii. Relationship. Nothing in this MoU is intended or shall be deemed to constitute a partnership, agency, employer-employee, or joint-venture relationship between the Parties. No Party shall at any time be considered or hold itself out as an employee, partner, joint venture, agent, principal, or common member of any form of business entity with the other Parties. No Party shall have the authority to execute or modify agreements or to make commitments on behalf of the other Parties.
- iii. Bank details of the university, in case any reimbursement is agreed, subject to actual expenditure

Name of the beneficiary: LUCKNOW UNIVERSITY NON REC. NON MEDICAL A/C

Bank Name: STATE BANK OF INDIA

Bank address: LUCKNOW UNIVERSITY BRANCH (BRANCH CODE: 14906)

Bank account number: 38831836889

IFSC code: SBIN0014906

- iv. Disclaimer. The Parties understand and agree that the compounds are experimental in nature and may have hazardous properties, and they are provided without any warranties, express or implied, from DNDi or the University, including any warranty of fitness for any particular purpose. The compounds shall not be administered to or used in human beings. The University shall ensure that the compounds are provided with this information.
- v. Non-exclusivity. This MoU is nonexclusive in nature and does not affect any Party's ability to enter into agreements or affiliations with other parties.
- vi. The Point of Contact from University of Lucknow for activities related to this MoU is Dr. Sushil Kumar Maurya, Associate Professor.

IN WITNESS WHEREOF, the Parties hereby execute this Memorandum of Understanding in duplicate and acknowledge that they are authorized to execute same:

On behalf of Drugs for Neglected Diseases initiative

By: 

Name: Dr Peter Sjo

Title: Head, Drug Discovery

Date: 2023-02-08

On behalf of UNIVERSITY OF LUCKNOW, LUCKNOW, INDIA

By: 

Name: Prof. Alok Kumar Rai

Title: Vice-Chancellor

University of Lucknow

Date: 8.2.23

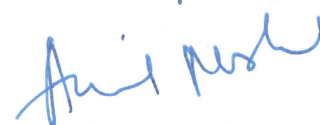


Name: Prof. Poonam Tandon

Title: Dean, Academics

University of Lucknow

Date: 8/02/2023.



Name: Prof. Anil Mishra

Title: Head, Department of Chemistry

University of Lucknow

Date: 8.2.23

On behalf of DNDi Drugs for

Neglected Diseases initiative India Foundation

By: 

Name: Dr Kavita Singh

Title: Director, South Asia

Date: 08-Feb-2023.

Annex 1:

Student crowd sourcing: Synthetic Chemistry Exercise or Medicinal Chemistry Exercise

DNDi is exploring the concept of open-source drug discovery by conducting some pilot studies to test different mechanisms. One model is the concept of student crowd sourcing. The principle is that later year students pursue practical synthetic / medicinal chemistry projects as part of their coursework. Globally this represents a huge synthetic chemistry resource which is often focused entirely on training with little regard to the practical outcome of the chemical synthesis. If part of this resource could be directed towards synthesis of molecules of value to drug research it would increase annotation and understanding of early drug leads. Of course, the focus of DNDi is drug hits leads for neglected tropical and viral diseases. The approach for this exercise is to look at a crowd sourcing model and explore incentives which might attract teaching programs to embrace the concept.

The principle is to start with hits from drug screens which are not encumbered by intellectual property constraints to DNDi's best knowledge. Initially these would be submitted to experienced medicinal chemists who would propose a series of 10-15 analogues to explore SAR together with explanation of why the analogues were designed and proposed synthetic routes.

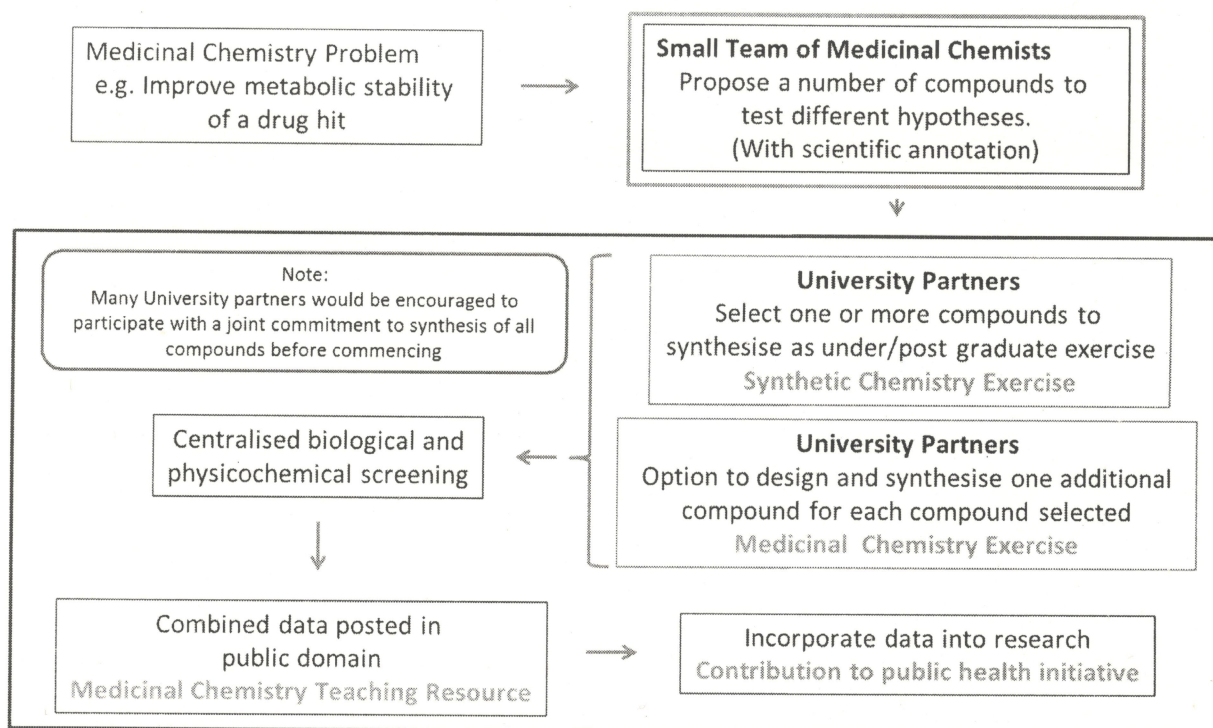
This information, along with initial data surrounding known analogues, would then be presented as a challenge to classes as a teaching exercise. The expectation is that a number of university classes would agree to collectively synthesise all compounds in the series within defined timeframes. DNDi would then centralize the compounds and conduct the appropriate biological/physchem assays and return this data to the classes.

Incentives for the students/tutors would include.

- A teaching exercise with "real world outcomes"
 - Synthetic chemistry
 - Medicinal chemistry. In addition to the medicinal chemistry exercise associated with the series proposed by med chemists, classes would have an option to design and synthesise analogues which they think could be better than those proposed by DNDi
- Publication – individual micropublication (e.g., chemspider at the RSC) and subsequent collective publication with the different universities involved in the exercise
- Collaboration between university classes
- Raising the profile of neglected tropical and viral diseases' drug research

The entire exercise would be open source and public domain. That is there would be no ownership of intellectual property around the starting material or the compounds synthesized during the exercise and all data which is generated would be made available in the public domain via publication.

A preliminary feasibility study via questionnaire and interview with academic teaching laboratories demonstrated considerable interest in the exercise and the next step is to conduct a pilot study to test logistics etc.



Annex 2:

APPLICATION FORM

for the Synthetic Chemistry Exercise or the Medicinal Chemistry Exercise

proposed by Drugs for Neglected Diseases initiative (DNDi)

If you are interested in *synthesizing* the compounds designed by DNDi's medicinal chemists or in *designing and synthesizing* analogue(s) as part of a practical work, for testing against neglected tropical and viral diseases pursuant to the concept paper herewith attached as Annex 1, please fill in this form.

Name of University: ("University")

Student Name: ("You")

Description of the practical work:

Design and/or synthesis of:

By signing this application form, you agree with the following terms and conditions:

1. You agree that You will not seek or obtain any protection of any (registered or unregistered) intellectual property rights over the Results of the practical work, including methods of synthesis, description thereof, data, analysis of data, reports, follow-on compounds, other information and materials, and will place such Results in the public domain by way of publication or presentation.
2. DNDi encourages the subsequent collective publication of all Results of this chemistry program in a scientific peer-reviewed journal. All publications or presentations shall contain appropriate acknowledgement of DNDi's and other participants' contributions.
3. You and University agree that the Results of the practical work, including relevant analytical data, will be made available to anyone for any non-commercial purpose, following the publication outlined in point 2.
4. Together with UNIVERSITY OF LUCKNOW, LUCKNOW, INDIA, You agree to make the samples of the synthesized compound(s) available free of charge and under the same conditions as specified in this Application Form to anyone who requests them, provided that none of these requests require resynthesis of additional quantities, and that the requesting organization covers the costs of shipment. You shall not engage in any profit-making or commercial use of any Results.
5. The practical work will be conducted under Your and UNIVERSITY OF LUCKNOW, LUCKNOW, INDIA's exclusive responsibility.

Student Signature:

Date:

University's Representative Signature:

Date: