PROFORMA FOR SUBMISSION OF R&D
AND DEMONSTRATION PROJECTS IN THE IDENTIFIED AREAS

(*To be Submitted in 6 copies*) (Soft copy not acceptable)

PART I : GENERAL INFORMATION

1. Project Title : Convergence of two epidemics in two blocks of dist Dehradun (Uttarakhand): Tuberculosis and Diabetes

2. Name of the Institute/University/Organization: Himalayan Institute of Medical Sciences/ Swami Rama Himalayan University

3. Status of the Institute : Private University

4. Name and designation of the Executive Authority of the Institute / University forwarding the application : Registrar, Swami Rama Himalayan University

5. Category of the Project: Translational

6. Specific Area: Non Communicable Disorders

7. Duration: 1.5 Years

8. Total Cost (Rs.): **11,16,500 INR**

9. Is the project Single Institutional or Multiple-Institutional: Single Institutional

10. If the project is multi-institutional, please furnish the following: NA

11. **Project Summary:**

Tuberculosis (TB) is the largest infectious disease killer in the world. The South Asian region which consists of eight low and middle-income nations, namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka alone shares for nearly 44% of the world TB cases1 and a high burden of TB mortality (681,975 deaths), 38% of the worldwide burden. The high burdens of TB is further intricated by the growing prevalence of various risk factors such as acquired immunodeficiency syndrome, kidney disease, malnutrition, and diabetes in South Asia; and are further compounded by the health system-related and patient related factors such as access, diagnosis and treatment completion. It is therefore foreseeable that this surge in the diabetes prevalence will increase vulnerability to TB infection and negative treatment outcomes among those with active TB disease. The exact mechanism of how diabetes comorbidity impact health outcomes in TB patients has not been elucidated yet.

To address this problem, an attempt is made to generate database regarding prevalence of TB and diabetes co-morbidity & mainly recognise associated risk factors for the same. Outcome assessment of TB with diabetes in Uttarakhand remains underreported due to lack of policy in action regarding screening of diabetes in TB patients. This study will lay the foundation for future research

on prediction models for TB and Diabetes and will help in strengthen the health policies to focus on the better outcome of these two silent killers.

PART II : PARTICULARS OF INVESTIGATORS

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No. of Projects being handled at present:

PART III: TECHNICAL DETAILS OF PROJECT

14. **Introduction**

14.1 Origin of the proposal:

Tuberculosis (TB) is highest death causing infectious disease in world. Nations of South Asian region which consists of eight low and middle-income countries, like Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka alone contribute 44% of world TB cases[1] and significantly TB mortality i.e. 681,975 deaths and also, 38% worldwide bourdon[2], about. There are various risk factors such as acquired immunodeficiency syndrome, renal disease, malnutrition, and diabetes in South Asia that has led to further complications in the high burden of TB; and has become worse by the health system and patient related detail such as access, recognize and treatment completion[3,4]. The load of cardio metabolic diseases, especially diabetes has become a crucial health problem in South Asian countries, with an expected inclined in diabetes prevalence of more than 151% between 2000 and 2020[5,6]. While, several studies have indicated that South Asians are at major risk of developing cardio metabolic diseases including diabetes compared to other native or ethnic groups[5,7]. It has been found that the risk of catching TB has been escalated by three folds due to diabetes[8,9]. Also, diabetes is associated with a higher risk of failure in TB treatment or relapse, failure in culture conversion at 6-months and 2-months[10] and deaths in TB patients, more precisely pulmonary TB patients[11]. As a further matter, a systematic review by Gautam et al 2021[12] showed that the patients with TB- diabetes comorbidity are at higher risk of mortality (RR = 1.89 (95% CI 1.52–2.36), combined outcome failure and death (RR = 1.69 (95% CI 1.36–2.12), and relapse (RR = 3.89 (95% CI 2.43–6.23) than TB only patients[13]. So it can be concluded from the review that the surge in the diabetes prevalence will increase vulnerability to TB infection and also the treatment outcomes will be negative among those with active TB disease[14, 15,16]. Till date, there is no information on the exact mechanism of how diabetes comorbidity impact health outcomes in TB patients. But, some evidence has been found for the negative impact of diabetes comorbidity on the TB treatment outcome[10,11,17]. For the diabetes impact on the TB treatment outcome , several mechanisms have been suggested that includes altered immunological response[18,19] , increased insulin resistance due to anti-tuberculosis drugs particularly 'Rifampicin' and impaired immunity due to diabetes itself[20]. However, there is limited evidence which summarizes the impact of diabetes on TB treatment outcomes from the South Asian population. Hence this proposal fills this lacuna.

14.2 Definition of the problem:

To address this problem, an attempt is made to generate database regarding prevalence of TB and diabetes co-morbidity & mainly recognise associated risk factors for the same. Outcome assessment of TB with diabetes in Uttarakhand remains underreported due to lack of policy in action regarding

screening of diabetes in TB patients. This study will lay the foundation for future research on prediction models for TB and Diabetes and will help in strengthen the health policies to focus on the better outcome of these two silent killers.

14.3   Aim & Objectives:

Aim:

- Epidemiological evaluation of registered TB cases with diabetes /pre-diabetes under Revised National Tuberculosis Control Program.

Objectives:
- To know the frequency of diabetes and pre-diabetes among TB patients.
- To determine the associated risk factors among cases of TB and diabetes.
- To find out the pattern of drug resistance in TB and diabetic cases.
- To assess the outcome in TB and diabetic cases during the study period.

15.   Review of Current Status of research and development in the subject

Due to high rates of diabetes and TB, India has to face many challenges in controlling both the diseases. In India, there were 61.3 million people living with diabetes, and 983,000 deaths from the disease . This number is expected to increase to 101.2 million by 2030 (2011 estimates)[21]. As per 2016 census, around 2.17 million people in India are developing TB and almost 423,000 people are dying of it each year[22]. According to World Health Organization (WHO-2009) report, the death rate due to TB was 23 per one lakh population in India. The primary goal of STOP TB is to reduce the global burden of TB (deaths and prevalence) by 50% in 2015, compared to 1990 levels [23]. Due to increased number of people developing diabetes, after China, India ranks second in the number of people affected by diabetes. There are around 72 million people living with diabetes and the estimated prevalence of diabetes in India was 10.4% in 2017 [24].

World Health Organizations and the International Union against Tuberculosis and Lung Diseases (The Union) suggested that the immune system gets alter in the diabetic patients i.e., it becomes weak therefore, the risk of contracting TB as well as other infectious disease increases. So we need to think, about TB in diabetic patients and screen them, and about diabetes in TB patients. We need to think seriously about the link between TB and diabetes, to get to know about good advances made in TB control, especially in countries like China and India. It has been reported by studies that the diabetic patients are at three-fold higher risk of developing TB. It has been found that the negative impact on TB control is threatening due to the increasing incidence of diabetes, especially in low- and middle- income countries, and vice versa .

But a very few studies are available worldwide which shows association of diabetes and tuberculosis. Studies that screened for DM among TB patients reported a wide range of DM prevalence among TB patients, ranging from 1.9% to as high as 35%[25,26,27]. There are inadequate data on prevalence of DM and pre-diabetes among TB cases in India. Only four studies in India reported the Burden of TB cases co-morbid with diabetes recently Viz., Vishwanathan et al 2012[28] (Tamilnadu), Soundaranjan et al 2014[29] (Pondicherry), Mansuri et al 2015[30] (Ahmedabad), Kumar et al 2018[31] (Pune & Chennai). Nearly 4,300 cases were reported in 2017 from Uttarakhand but still there is a paucity of data base in the state. Recently, it has been reported in Times of India that Haridwar is slowly turning into the tuberculosis capital of Uttarakhand[32]. In this state, the number of TB cases were increased in 2017 (14,807), as compared to 2016 when 13,750 cases were detected. According to health data department, it was founded that the TB cases from plains were more than from the hills. .

It is well known that diabetic patients are at higher risk of contracting TB, and diabetes can worsen the course of TB and TB can worsen glycaemic control in patients with diabetes. Association of BMI with these two epidemics is also underworked in many developing countries. Due to lack of well- designed systematic study, many research questions regarding association between diabetes and TB remain unanswered.

Recently a report was published by government of India in 2019,[33] which stated the process known as "bidirectional screening" i.e., it is essential to screen the people who have one disease for the other and vice versa in response to high prevalence rate of both Diabetes & TB. It is reported that Under RNTCP, 29% (4% - 98% across state/ UTs) of the notified TB patients in 2018 at the National level were screened for Diabetes, with nearly 8% (3% - 28% across state/Uts 8% also in Uttarakhand) among those screened, confirmed with newly diagnosed/already existing Diabetes and 40% (0% - 100% across state/UTs) among those initiated on Anti-Diabetic therapy .

To address this problem, an attempt is made to generate database regarding prevalence of TB and diabetes co-morbidity & mainly recognise associated risk factors for the same. Outcome assessment of TB with diabetes in Uttarakhand remains underreported due to lack of policy in action regarding screening of diabetes in TB patients. This study will lay the foundation for future research on prediction models for TB and Diabetes and will help in strengthen the health policies to focus on the better outcome of these two silent killers .

15.3 Importance of the proposed project in the context of current status :

The Collaborative Framework for care and control of TB and diabetes, has already initiated actions on several fronts. It has stimulated pilot projects, national policy dialogue, and new research. In May 2014, WHO's new End TB Strategy which incorporates all essential elements of TB and diabetes

collaborative activities, was approved by the World Health Assembly. The WHO Non Communicable Diseases Global Action Plan 2013–2020 aims to reduce the impact of diabetes. The new Sustainable Development Goals also place the spotlight on ending TB as well as reducing premature mortality from NCDs – including diabetes – by one third. To end TB and diabetes, a joint response is required to ensure that all people with TB and with diabetes have access to much-needed care on both fronts. This study is indeed as keeping in mind the co-existence of the two epidemics, vigorous data bases have been developed from different parts of India except Uttarakhand. This is a Pioneer research work in concern with community health conducted in Uttarakhand, India and will foster the background for management of patients with comorbidity and also lay the foundation for further research. Present research database will help us to develop prediction based model using machine learning for identifying risk associated factors in TB cases with diabetes in early stages. This will adversely impact the outcome by reducing the prevalence of drug resistance and mortality in Tuberculosis cases co-morbid with diabetes. Such condition can also help in improving the care and control of both diseases by early detection.

15.4 Anticipated Products & Processes of Practical/Technological utility /socioeconomic relevance expected to be evolved by pursuing the project :

To address this problem, an attempt is made to generate database regarding prevalence of TB and diabetes co-morbidity & mainly recognise associated risk factors for the same. Outcome assessment of TB with diabetes in Uttarakhand remains underreported due to lack of policy in action regarding screening of diabetes in TB patients. This study will lay the foundation for future research on prediction models for TB and Diabetes and will help in strengthen the health policies to focus on the better outcome of these two silent killers.

15.5 Expertise available with the proposed investigating group / institution in the subject of the project :

- HIMS is the only private institution that provides healthcare facility to rural population in Uttarakhand. This institution has vast expertise, infrastructure and state-of-the-Art instrumentation, and ideal platform for conducting this kind of research. Also, conducting research in Himalayan terrains.
- Investigator already working in area of machine learning and deep learning and its applications to various areas of medical image analysis including radiology data as well as pathology data.

15.6 How this proposal is beneficial to the State:

It is a well-known fact that people with Diabetes mellitus have three-fold risk of development of TB. Uttarakhand being the state with hilly terrains and many hard to reach areas has ailing health services in

the state. Lack of doctors and specialists, inaccessibility due to geographical proximity, inadequate medical infrastructure to carry out basic diagnosis are some of the main reasons for the state's dismal performance. And the worst affected are the population suffering from chronic diseases, requiring proper diagnosis, treatment and complication prevention at the early stages of disease. This project will help to find out the true burden of two epidemics going hand in hand silently while affecting the economy and all aspects of health of the individual, Family and community. Due to covid pandemic there was a setback in terms of research on these two public health important yet preventable diseases in Uttarakhand. This study will also bring in notice the weaknesses of the health system and resource poor settings where improvement can be done for the better treatment results of these preventable and treatable illnesses.

16. Work Plan

16.1 Methodology:

(a) **Study design :** Prospective, follow-up

(b) **Sampling:** All registered cases during January 2024 to June 2025.

(c) **Sample size:** population universe will include all registered cases (above>18 year) of tuberculosis in CHC Doiwala, PHC Kalsi and Himalayan Hospital DOTS centre after taking written informed consent.

Minimum Sample size is calculated using formula $4pq/l^2$;

As there is no published data on TB with comorbidities (especially diabetes) cases for Dehradun dist, so we presumed the prevalence of TB with comorbidities (p) is 50%. i.e p=50% & q is 100-50, i.e. 50; L is allowable error which is taken as 5% with 95% confidence interval. Thus the sample size came out to be 400.

(d) **Selection of Samples:** All registered cases in CHC Doiwala, PHC Kalsi and Himalayan hospital under Revised National Tuberculosis Control Program in DOTS and DOTS Plus centre from January 2024 to June 2025.

(e) **Definitions:**
Criteria for diagnosis of diabetes are considered as fasting blood sugar level >125 mg/dl and 2 h post-glucose load >200 mg/dl or a self-reported history of diabetes and he/she is on anti-diabetic drugs after diagnosis by a physician .

(f) Study Duration: The study will complete in 18 months (July 2024-Dec 2025).

(g) Study Subjects: All subjects (aged 18 years and above) with an established diagnosis of TB registered under CHC Doiwala, PHC Kalsi and Himalayan Hospital in Uttarakhand during the study period will be considered as the targeted population after approval from Chief Medical Officer Dist

Dehradun. Further, the written informed consent will be obtained from the subjects. Moreover, patients of Type 1 diabetes and seriously ill patients such as TB meningitis and septicaemia and pregnant patients will be under exclusion criteria of the study . The study will be conducted after written approval from ethics committee.

(h) Data collection method

The current study will be facility-based longitudinal follow-up study conducted on registered cases of TB in Uttarakhand, equal or above the age of 18 years who give their consent from Jan 2024 to June 2025. Questionnaire including information on demography, family history of DM and TB illness, smoking habit, alcohol intake and diet will be collected. Also BMI and Blood pressure will be determined".

Study will be planned and conducted as in following steps :

Line listing & Sampling: A list will be prepared of all TB patients of age 18 years or above who are on DOTS therapy at that time. A Structured questionnaire will be designed after review of various literatures and which will be used to collect data from participants who met the inclusion criteria. The enrolled subjects will be follow up by personal contact or telephonically (Quarterly basis) in period of one year after enrolment in the study .

Interview and investigation and data generation

Three steps

- First Step: The day will be decided of DOTS therapy for all selected patients. Further participants will be contacted, and information on socio- demographic profile including age, sex, weight, height, education, occupation economic status history of any addiction will be collected .
- Second Step: This section consisted of assessment of TB status of patients including type of TB, category, and duration of treatment .
- Third step: The third section consists of testing of blood glucose level by fasting or random blood glucose level of patients, who are not diagnosed by registered medical practitioner as diabetic, history of diabetes, family history of diabetes, and treatment history of diabetes. Also HbA1C will be estimated on the spot using i Chroma II analyser .

Criteria for diagnosis of diabetes are considered as fasting blood sugar level >125 mg/dl and 2 h post-glucose load >200 mg/dl or a self-reported history of diabetes and he/she is on anti-diabetic drugs after diagnosis by a physician .

Diagnostic criteria for diabetes:

Parameter	Normoglycemia	Prediabetes	Diabetes
FPG	< 110 mg/dl	110-125 mg/dl (IFG)	≥126 mg/dl
2-h PG	<140 mg/dl	140-199 mg/dl (IGT)	≥ 200 mg/dl
HbA1c	<5.7%	5.7-6.4%	≥ 6.5%
Random plasma glucose*			≥ 200 mg/dl (with symptoms of diabetes)

* Individuals with random plasma glucose between 140-199mg/dl are recommended to undergo OGTT
IFG - Impaired Fasting Glucose; IGT - Impaired Glucose tolerance; FPG - Fasting Plasma Glucose; 2-h PG-2 hour post load Glucose test (oral glucose tolerance test) plasma glucose. HbA1c – Glycosylated Haemoglobin

(i) **Statistical Analysis** : Data entry will be done in Microsoft Excel 2007 and analyze using Epi Info 7 and SPSS sw. Appropriate statistical test will be applied and statistical significance will be taken at $p<0.05$ & CI-95% and relative risk ratio will be calculated.

16.2 Proprietary/patented items, if any, expected to be used for this project: Copyright and patent

16.3 Organization of work elements

The current study will be facility-based longitudinal follow-up study conducted on registered cases of TB in Uttarakhand, equal or above the age of 18 years who give their consent from July 2024 to December 2025.

 Study will be planned and conducted as in following steps :

 Line listing & Sampling: A list will be prepared of all TB patients of age 18 years or above who are on DOTS therapy at that time. A Structured questionnaire will be designed after review of various literatures and which will be used to collect data from participants who met the inclusion criteria. The enrolled subjects will be follow up by personal contact or telephonically (Quarterly basis) in period of one year after enrolment in the study .

Interview and investigation and data generation

Three steps

- First Step: The day will be decided of DOTS therapy for all selected patients. Further participants will be contacted, and information on socio- demographic profile including age, sex, weight, height, education, occupation economic status history of any addiction will be collected .

- Second Step: This section consisted of assessment of TB status of patients including type of TB, category, and duration of treatment .
- Third step: The third section consists of testing of blood glucose level by fasting or random blood glucose level of patients, who are not diagnosed by registered medical practitioner as diabetic, history of diabetes, family history of diabetes, and treatment history of diabetes. Also HbA1C will be estimated on the spot using i Chroma II analyser .

Criteria for diagnosis of diabetes are considered as fasting blood sugar level >125 mg/dl and 2 h post-glucose load >200 mg/dl or a self-reported history of diabetes and he/she is on anti-diabetic drugs after diagnosis by a physician .

16.4 Suggested plan of action for utilisation of research outcome expected from the Project

This is a Pioneer research work, taking into consideration the community health conducted in Uttarakhand, India and will foster the background for management of patients with comorbidity and also lay the foundation for further research. Present research database will help us to develop prediction based model using machine learning for identifying risk associated factors in TB cases with diabetes in early stages. This will further have a impact on adverse outcome by reducing the prevalence of drug resistance and mortality in Tuberculosis cases co-morbid with diabetes. Early detection of such condition can also help in improving the care and control of both diseases

16.5 Time schedule of activities giving milestones

	Name of Milestone	Expected Start (Month/Year)	Address
1.	Collection of RNTCP data and sampling map & contact with subjects	July 2024 -Sept 2024	Himalayan Hospital/CHC Doiwala/ PHC Kalsi
2	Questionnaire based information, Sample collection after taking informed consent and reporting	Oct 2024- June 2025	Field visit Doiwala and Kalsi
3.	Analysis	July 2025-Sept 2025	Himalayan Hospital
4.	Paper publication & Report writing	Oct 2025- Dec 2025	Himalayan Hospital

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16.6 Project implementing Agency/Agencies

Name of Agency	Address of Agency	Proposed Research Aspects	Proposed Amount	Cost Sharing %
NA				

PART IV: BUDGET PARTICULARS

17. **Budget** (In Rupees)

A. Non-Recurring (e.g. equipment, accessories, etc.)

S.N	Item	Years	Total
1	Workstation	Ist Year	50,000
2	2 Tab	Ist Year	60,000

B. Recurring

B.1 Manpower

S.N	Item	Quantity	Years	Total
1	1 JRF	1	Ist Year (25000/month)	3,00,000
2	1 JRF	1	IInd Year (25000/month)	1,50,000
				4,50,000

B.2 Consumables

S.N	Item	Ist Years	IInd Years	Total
1	Sugar Testing FBS/RBS & HbA1c	100,000	30,000	1,30,000
2	iCHROMA Analyser	1,50,000	-	1,50,000
3	Physical examination Weighing balance, height measurement, bp instruments	30,000	-	30,000

Sub-Total (B.2) =1,30,000+1,50,000+30,000= 3,10,000

Other Items	Years		Total
	I	**II**	
B.3 Travel	100,000	50,000	1,50,000
B.4 Contingency (Consent form, case report form, stationary etc)	50,000	20,000	70,000
B.5 Overhead Charges (if applicable)			26,500

Sub-Total (B=4,50,000+3,10,000+1,50,000+70,000+26,500= 10,06500

Grand Total =(A+B) 1,10,000+10,06500 =11,16,500 INR

Note :

Please give justification for each head and sub-head separately mentioned in the above table.

Financial Year : April - March

In case of multi-institutional project, the budget estimate to be given separately for each institution.

17.1- Justification:

**A.	Non-Recurring (e.g. equipment, accessories, etc.):**

Workstation: It is required for data management of the collected information.

TAB Lenovo: Required to collect information from subject's door to door.

**B.	Recurring:**

B.1 Manpower: Manpower is required to collect questionnaire based information from study subjects. Also required for telephonic follow up for further assessment visits for estimating blood glucose level, physical examination etc.

B.2 Consumables:

These are required to estimate blood glucose level viz., Fasting sugar or Random blood sugar level, HbA1c etc. BMI and blood pressure of the subject will also determine.

B.3 Travel: Required to visit door to door of the registered subjects in Doiwala area and Kalsi area.

B.4 Contingency: Required for printing, photocopy of subject information sheet, subject informed consent document, case report form, patient diary, Audit fees etc

B.5 Overhead Charges (if applicable): As per norms of ICMR & University.

18.1- Designation of official empowered to receive financial grants:

Registrar

Swami Rama Himalayan University

Swami Ram Nagar, Jollygrant-248140

Dehradun (Uttarakhand)

Account Details:

Bank name & address:

Bank Account No:

IFSC code:

PAN No:

GST No.:

Attached Photocopy of cancelled cheque

18.2- (i)- Does this project require approval from Institutional Ethics Committee : **Yes**

(ii)- If **Yes** then provide the Institutional Ethics Committee Certificate from competent authority

PART V: EXISTING FACILITIES

19. Available equipment and accessories to be utilized for the project:

Himalayan hospital has fully functional dementia clinic.

S.No	Name of equipment/ accessories	Make	Model	Funding Agency	Year of Procurement
NA					

PART VI : DECLARATION/CERTIFICATION

It is certified that

(a) the research work proposed in the scheme/project does not in any way duplicate the work already done or being carried out elsewhere on the subject.

(b) the same project has not been submitted to any other agency/agencies for financial support.

(c) the emoluments for the manpower proposed are those admissible to persons of corresponding status employed in the institute/university.

(d) necessary provision for the scheme/project will be made in the Institute/University/State budget in anticipation of the sanction of the scheme/project.

(e) if the project involves the utilisation of genetically engineered organism, it is agreed that we will ensure that an application will be submitted through our Institutional Biosafety Committee and we will declare that while conducting experiments, the Biosafety Guidelines would be followed.

(f) if the project involves field trials/experiments/exchange of specimens, etc. we will ensure that ethical clearances would be taken from concerned ethical Committees/Competent authorities.

(g) it is agreed that any research outcome or intellectual property right(s) on the invention(s) arising out of the project shall be taken in accordance with the instructions of the Council.

(h) the institute/university agrees that the equipment, other basic facilities and such other administrative facilities as per terms and conditions of the grant will be extended to investigator(s) throughout the duration of the project.

(i) the Institute assumes to undertake the financial and other management responsibilities of the project.

Sign. with Seal of Executive Authority of Institute

Date :

Signature of Principal Investigator: **Signature of Co-Investigator**

Date :   **Date :**

Signature of Co-Investigator

Date :

PART VII : PROFORMA FOR BIODATA OF PRINCIPAL INVESTIGATOR

1.	GENERAL PARTICULARS

Name: Dr Nikku Yadav
Designation: Assistant Professor (Clinical Research)
Name of the Department/Institute/University: Under Department of Community Medicine,
Himalayan Institute Medical Sciences, Swami Rama Himalayan University
Date of Birth: 26.11.1984   Sex (M/F): F

2.	EDUCATIONAL DETAILS (GRADUATION ONWARDS)			
S. No.	**Institution**	**Degree Awarded**	**Year**	**Field of Study**
4	Apeejay Stya University, Gurgaon	PhD	2011-17	Medical Biotechnology

3.	PROFESSIONAL CAREER (STARTING WITH THE MOST RECENT EMPLOYMENT)			
S. No.	**Institution**	**Position**	**From (Date)**	**To (Date)**
1	Himalayan Institute of Medical Sciences, Swami Rama Himalayan University	Assistant Professor	1 Sept 2017	Till Present
2	Centre for Clinical Research, ASU	Research Associate	Aug 2016	Aug 2017
3	Centre for Clinical Research, ASU	Teaching Assistantship	Aug 2011	July 2016
3	BS Anagpuria institute of Pharmacy	Lecturer	Sept 2010	July 2011

4.	HONORS/ AWARDS

- Presented paper at 40th European Thyroid Association Convention, Newcastle, UK, Sep 2018 as **Young Investigator Travel Grant Awardee** of UCOST
- Presented paper at 39the European Thyroid Association Convention, Copenhagen, Sep 2016 as **Young Investigator Travel Grant Awardee** of ETA
- Presented paper at 38the European Thyroid Association Convention, Santiago de Compostela, Spain Sep 2014 as **Young Investigator Travel Grant Awardee** of ETA

• Awarded **Excellent talk** award at the international conference on Sport Medcon held at CGO Complex New Delhi 2009	
• Awarded **Ist Rank in Research** in National level Two Days Conference on Nanotechnology held at Shahada, Maharashtra, 2009	

	ATIONS (NUMBERS ONLY)	
i. Books Chapters: 3	ii. Research Papers, Reports: 25	iii. General articles:
iv. Patents : NIL	v. Others (Please specify):	

List of important publications

•Ankit Singh, Nikku Yadav, Arnav Bhavsar, Ashwani Bhatt, S Raghuvanshi (2020). Deep Machine learning in healthcare: Prognosis to diagnosis- A novel approach Accepted in Journal of Critical Review JCR. 2020; 7(19): 7540-7549 doi: 10.31838/jcr.07.19.860

•Lovnish Thakur, Prerna Vadhera, Nikku Yadav (2020). Combating SARS-COV-19 by phytochemicals: an in silico study. Innovare Journal of Life Sciences, 8(4): 1-4.

•Snehlata Tendi, Nikku Yadav, Shruti Mishra, Jayanti Semwal, Asha Chandola-Saklani (2019). Thyroid hormone reference ranges in pregnant women based on indigenous population: a multi centric study from iodine-deficient endemic zones in three states of India European Thyroid Journal;8(suppl 1):60(DOI: 10.1159/000501012)

•Nikku Yadav, Atul Kathait, DS Malik, Madanjeet Pasricha, Sunil K Mishra, Asha Chandola Saklani (2018). Trimester specific thyroid hormone dynamics, iodine reserve and pregnancy outcomes: A longitudinal study submitted in Thyroid Research and Practice;15(3):105-112 (DOI: 10.4103/TRP_23_18).

•Shruti Mishra, Diksha Topwal, Ashish Joshi, Nikku Yadav, Atul Kathait, Anjana Farswan, Jayanti Semwal, Asha Chandola-Saklani (2018). Iodine deficiency disorders and adverse pregnancy outcome in Himalayan mountain population. European Thyroid Journal;7(suppl 1):106(DOI:10.1159/000491542).

•Lovnish Thakur, Nikku Yadav. Structure-based virtual screening of phytochemical for dopamine D2 receptor ligands as future antipsychotics: An Ayur-informatics approach (2018). Indian Journal of Bioinformatics and Biotechnology,6 (6):1-6

•Shivam Pargai, Nikku Yadav,Arti Saklani, Sonali Negi, Ankit Singh,Jayanti Semwal, Asha Chandola-Saklani(2018). Preliminary study on neurodevelopmental parameters and clinical

milestones in young children (4-48 Months) in rural Himalayan foot hills. European Thyroid Journal;7(suppl 1):107 (DOI:10.1159/000491542)

•Nikku Yadav, Atul Kathait, Asha Chandola Saklani (2017). A longitudinal study of maternal thyroid hormones and neurodevelopmental behavioral clinical milestones in offspring. European Thyroid Journal 2017;6(suppl 1):122. DOI: 10.1159/000477987

•Snehlata Tendi, Nikku Yadav, Jayanti Semwal, Ruchi Juyal, Asha Chandola-Saklani (2017). Monitoring of adverse pregnancy outcome in rural population from iodine deficient zones: A multi-centric pilot study from Northern India. European Thyroid Journal;6(suppl 1):113 DOI: 10.1159/000477987

•Sakshi Saxena, Nikku Yadav (2017). Fast Dissolving Tablets: A boon to pharmaceutical industry. Research and Review a journal of pharmaceutical sciences: 6(1):25-37

•Nikku Yadav, Atul Kathait, Vineet Sharma, Asha Chandola Saklani (2016). Thyroid homeostasis in Iodine-deficient & Iodine-sufficient healthy Indian pregnant women. European Thyroid Journal: 5(suppl 1):56-176 DOI: 10.1159/0000447462

• Nikku Yadav, Vineet Sharma, Atul Kathait, Asha Chandola Saklani (2016). Comparison of an alternative and existing dbs matrix for estimation of thyroid stimulating hormone (TSH) in adults. International Journal of Advanced Research, 4: 1516-1525.

Project(s) submitted / being pursued / carried out by Investigator

S.N	Title of Project	Funding Agency	Duration From To	No. of Scientists/ Associates working under the projects	Total approved cost of the project (in Rs.)
1	Establishment of population-specific reference range of thyroid hormones in iodine deficient population during pregnancy: Uttarakhand Himalaya	UCOST	4 March 2020	3	5,43,900 INR
2	Predicting Blood levels of Hemoglobin & Bilirubin using Photographic images of eye: A machine learning approach."	SRHU	May 2021	5	10,000 INR
3	Epidemiological study of Dementia in Uttarakhand: A Comprehensive Approach	ICMR	Submitted Dec 2021	4	17 Lakh

Place :

Date :   **Signature**

PART VII : PROFORMA FOR BIODATA OF CO INVESTIGATOR

1.	GENERAL PARTICULARS

Name: Dr. DEEP SHIKHA
Designation: Associate Professor (Community Medicine)
Name of the Department/Institute/University: Department of Community Medicine, Himalayan Institute Medical Sciences, Swami Rama Himalayan University
Date of Birth: 17.07.1981   **Sex (M/F): F**

2.	EDUCATIONAL DETAILS (GRADUATION ONWARDS)			
S. No.	**Institution**	**Degree Awarded**	**Year**	**Field of Study**
1	St. Petersburg State Medical Academy, St. Petersburg Russia	**MBBS (GOLD MEDALIST)**	2006	**Medical**
2	Himalayan Institute of Medical Sciences	**MD (Community medicine)**	May 2010- May2013	**Community Medicine**

3.	PROFESSIONAL CAREER (STARTING WITH THE MOST RECENT EMPLOYMENT)			
S. No.	**Institution**	**Position**	**From (Date)**	**To (Date)**
1	Himalayan Institute of Medical Sciences, Swami Rama Himalayan University	**Associate Professor**	1/08/2018	Till date
		Assistant Professor	11/11/2013	31/07/2018
		Senior Resident	25/7/2013	10/11/2013

4.	HONORS/ AWARDS

List of important publications

1. **Shikha D**, Semwal J, Srivastava AK, Vyas S, Juyal R. An epidemiological evaluation of predictors of overweight and obesity in Garhwal region of Uttarakhand. J Prev Med Hyg 2019;60:E211-E218. https://doi.org/10.15167/2421-4248/jpmh2019.60.3.851

2. **Deep Shikha**, Semwal J, Srivastava AK, Singh M, Kandpal SD. A Study On Rural & Urban Differences In Tobacco Use And Its Socio-Demographic Determinants In District Dehradun. NJIRM.2014; Vol.5(1):82-87.

3. **Deep Shikha**, Jayanti Semwal, AK Srivastava, Shaili Vyas, Hemchandra Sati. Practices & socio-cultural aspects of substance use among residents of a newly formed state: A cross sectional study in Dehradun. NJMR.2014;Vol.4(4):330-336.

4. **Deep Shikha**, Jayanti Semwal, A.K.Srivastava, Shaili Vyas, Ruchi Juyal, Hemchandra Sati. A Study on Association of Non Communicable Diseases Risk Factors and Prehypertension in Garhwal Region of North India. Int J Health Sci Res. 2017; 7(7):31-37.

5. Kritika, **Deep Shikha**, Jayanti Semwal, Shaili Vyas, Ruchi Juyal, Hem Chandra Sati. Nutritional status and associated comorbidities among the elderly in Doiwala block, Dehradun. Ind J Comm Health. 2014;26(1):197-203.

6. Vyas S, **Varshney D**, Sharma P, Juyal R, Nautiyal V, Shrotriya V. An overview of the predictors of symptomatic urinary tract infection among nursing students.Ann Med Health Sci Res. 2015 Jan-Feb;5(1):54-8.

7. Kritika ,**Deep Shikha**, Shaili Vyas, Ruchi Juyal, Jayanti Semwal. Substance use among the elderly in rural Dehradun : A hidden Problem. University Medical Journal 2016;1(1):31-34

8. Sudip Bhattacharya[1], Sheikh Mohd Saleem[2], **Deep Shikha**[3], Ozden Gokdemir[4], Kedar Mehta[5]. Role of vaccine science diplomacy in low-middle-income countries for eradicating the vaccine-preventable diseases: Targeting the "LAST MILE". " 2021;Volume : 10 , Issue : 8 ;Page : 2739-2744.

9. Kaur GD, Chauhan N, **Deep Shikha**[3], Kumar A. A Study on Weekly Iron Folic Acid Supplementation and Regular Deworming Programme in Rural Schools of Mathura District. NJMR. Jan –Mar 2020;Vol 10(1):46-50.print ISSN: 2249 4995 | eISSN: 2277 8810.

10. Singh SK, Semwal J, **Shikha D**, Singh Y, Bansal D, Bhattacharya S. Diabetes mellitus as a risk factor for ischemic stroke: a case control study. Int J Community Med Public Health 2019;6:1554-7.pISSN 2394-6032 | eISSN 2394-6040.

11. Imran W Khan, Ruchi Juyal ,**Deep Shikha** , Ravi Gupta , Vidisha Vallabh. Neuropsychiatric disorders in Rural and Urban areas of district Dehradun. Indian J Comm Health. 2018; 30, 3: 247-252.

12. Imran W Khan, Ruchi Juyal, **Deep Shikha**, Ravi Gupta. Generalized Anxiety disorder but not depression is associated with insomnia: a population-based study. Sleep Sci. 2018;11 (3):166-173.

Project(s) submitted / being pursued / carried out by Investigator

S.No	Research project completed as PI
1.	Health hazards of Information technologies among students of various educational courses.
2.	Piloting the feasibility of school health services in upliftment of health status of School children.
3.	Knowledge, attitude and practices (KAP) towards rabies: A survey among school children
4.	**STS- ICMR:** A study on effect of perceived stress on menstrual health among various undergraduate courses. **(as guide)**
5.	**STS –ICMR:** A study on sleep disorders among medical students **as guide**
Research project as Co-investigator	
6.	A study on library and e-resource usage by medical fraternity in HIMS.
7.	Extent of awareness and prevalence of adulteration in selected food items: A cross sectional study in a rural area of district Dehradun
8.	An epidemiological study of road traffic accidents reporting to the emergency deptt of HIHT hospital : A 5 year retrospective study.
9.	A study of headache prevalence and its impact in school going adolescents
10.	Knowledge, attitude and practices (KAP) of Medical students regarding Rabies & its prevention & control
11.	A study on relevance of Bayesian approach for epidemiological evaluation of Type II Diabetes Mellitus
12.	Piloting the feasibility of cervical cancer screening in a rural community of Dehradun
13.	A needs assessment study of sexual and reproductive health of adolescent girls in district Dehradun.
14.	Female literacy- Impact on women's empowerment and health – A cross sectional study among married women in Doiwala block of district Dehradun

15.	Corroborating the correlates of early menarche: a case control study.

Place :

Date :　　　**Signature of Co Investigator**

PART VII : PROFORMA FOR BIODATA OF CO INVESTIGATOR

1.	GENERAL PARTICULARS

Name: Dr. Rakhee Sodhi Khanduri
Designation: Professor & Head
Name of the Department/Institute/University: Pulmonary Medicine, Himalayan Institute Medical Sciences, Swami Rama Himalayan University
Date of Birth: Sex (M/F): F

2.	EDUCATIONAL DETAILS (GRADUATION ONWARDS)

MBBS & MD

Year	Institution	University
2000-2004	Govt. Medical College & Hospital (GMCH) Chandigarh [INDIA]	Punjab University
May, 2007	Chhatrapati Shahuji Maharaj Medical University (erstwhile King George Medical University) **Lucknow**	**Pulmonary Medicine,** King George Medical University

Work Experience

Senior Residency

Specialty	Year of joining	Institution/University	Department
Critical care medicine	Aug 2010- Jan 2011	Fortis hospital Mohali, India	Medical ICU
Pulmonary medicine	Feb 2011 – Sep 2012	Government medical college and hospital, Chandigarh	Department of pulmonary Medicine

		SRHU University	Department of Pulmonary Medicine
Pulmonary Medicine	Oct 2012 – Aug 2013	SRHU University	Department of Pulmonary Medicine

Position	Specialty	Year of joining	Institution/University
Assistant Professor	Pulmonary Medicine (Respiratory medicine)	Sept 2013 – 2017	Deptt of Pulmonary Medicine, SRHU University
Associate Professor	Pulmonary Med (Respiratory medicine)	2017-2021	Deptt of Pulmonary Medicine, SRHU University
Professor and Head	Respiratory medicine	1/2/21- till date	Deptt of Respiratory Medicine, SRHU University

List of Publications:

1.Sharma N, Vyas S, MohapatraA, Khanduri R, Roy P, Kumar R. Combating COVID 19 pandemic in india: Demystifying the concept of Herd immunity. J Family Med Prim care 2020(Accepted)

2.Das K, Agrawal N, Kala M, Khanduri R. Corona virus disease 2019 treatment-T cells hold the key in severe cases. Indian J Med Paediatr Oncol 2021(ahead of print)

3.Pant, S., kumar, S., Sodhi, R., ray, R. Restless legs syndrome in patients with chronic obstructive pulmonary disease. J Cardiothorac Med. 2020; 8(4):707-717.

4.Jethani V, Khanduri R, Khanduri S, Tanjea N, Aggarwal A. Retrospective study of clinical profile and management of patients with swine flu at tertiary care hospital. Int J Res MedSci 2019;7:251-4.

5.Khanduri RS, Jethani V, Kumar S, Sindhwani G, Chandra S, Pant S. Efficacy of pleural brush cytology in the diagnosis of pleural diseases. Indian J Respir Care 2019;8:76-9

6.Sodhi R, Jethani V, Rashmi J, Nadia S, A Rare Etiology of Drug Rash in a Patient Receiving Anti-Tuberculosis Treatment. J Cardiothorac Med. 2019; 7(3):499-502

7.Sodhi R, Pant S, Jethani V, Nadia S, Aggarwal M, Khanduri S. Rare Etiology of Cough and Chest Pain in a Young Male . J Cardiothorac Med. 2019; 7(3):503-506

8.Jethani V, Khanduri RS, Aggarwal A, Pant S. Uncommon etiology of chronic wheeze. Indian J Respir Care 2019;8:63-5.

9.Sushant Khanduri, Sonika Katiyar, Nand Kishore, Rakhee Sodhi, Ankit Aggarwal. Retrospective review of profile of intensive care unit admissions and outcomes in a tertiary care hospital of Himalayan region. International Journal of Research in Medical Sciences 2017;11:4715-18

10.Khanduri R, Jethani V. Kumar M, Patel K, Sindhwani G. An Unusual cause of hilar mass in an immunocompromised patient. SRHU Medical Journal, 2017;1(2):84-85

11.Rakhee S, SushantKh, Varuna J, Shirazi N, Manoj K. An Unusual Presentation of Granulomatosis with Polyangiitis. J Cardiothorac Med. 2017; 5(3): 204-207.

12.Kotwal A, Raghuvanshi S, Sindhwani G, Khanduri R. Mycobacterium tuberculosis and nontuberculosis mycobacteria co-infection: Two cases from the subHimalayan region of North India in a year. Lung India 2017;34:494-6

13.Pal S., Gupta A., Dhasmana R., Saini M., Khanduri R. &Bhat N.. Miliary tuberculosis in an immunocompetent adolescent. Indian Journal of Child Health 2017;, 4(3), 459-61.

14.MehakSawhney, NeenaChauhan, ManjuSaini, RakheeKhanduri. Clinicoradiological and pathological correlation of lung cancer patients presenting to a tertiary care centre. J. Evid. Based Med. Healthc. 2017; 4(32), 1877-1880.

15.Khanduri S, Janmeja AK, Saini V, Kashyap JR, Mohapatra PR, Sodhi R. Association of Nocturnal Cardiac Arrhythmias with Obstructive Sleep Apnea: A Case Control Study. National Journal of Medical and Allied Sciences 2017; 6(1):92-100

16.Sindhwani G, Sodhi R. Author's reply to concern on excessive dynamic airway collapse and wheeze. Lung India 2017;34:217-8

17.Khanduri R, SushantKhanduri, Sanjeevkumar, Ankursaini.
Drug resistant tuberculosis co-existing with invasive candidiasis in an immunocompetent 30 year old: a case report. Indian journal of tuberculosis 2017, 64(3):232-4

18.Sodhi R, Sindhwani G. Response to transbronchial lung biopsy in diffuse parenchymal lung disease: Question still remains whether to go for surgical lung biopsy or not?. Lung India 2016;33:353-4.

19.U. Sharma, S. K. Sahu, S. Agrawal, R. Khanduri, N. Shirazi, H. Kapruwan,
K. Nandra, G. Sachdev, A. Bisht.Primary splenic tuberculosis.The Sri Lanka Journal of Surgery 2016; 34(1): 15-16

20.Sindhwani G, Sodhi R, Saini M, Jethani V, Khanduri S, Singh B. Tracheobronchomalacia/excessive dynamic airway collapse in patients with chronic obstructive pulmonary disease with persistent expiratory wheeze: A pilot study. Lung India 2016;33:381-4.

21.Jethani V, Sindhwani G, Mehrotra V, Kotwal A, Khanduri R. Adenosine deaminase and interferon-gamma in diagnosis of tubercular pleural effusion. Int J Res Med Sci 2016;4:3951-5

22.G Sindhwani, R Khanduri, S Nadia, V Jethani. Pleural hemangioma- a rare cause of recurrent pleural effusion. Respiratory Medicine case reports 2016;17: 24-6

23.Sodhi R, Sindhwani G, Nadia Sh, Kumar S, Jethani V, Khanduri S. A Three-Year Experience of Medical Thoracoscopy at A Tertiary Care Center of Himalayan Region. J Cardiothorac Med. 2016; 4(1):397-402

24.Girish Sindhwani,RakheeKhanduri, VarunaJethani, Sanjeev Kumar.Trepopnea due to blood clot: An uncommon presentation [pg. 280]Med J DY PatilUniv2016; 9: 280-2

25.Sindhwani G, Shirazi N, Sodhi R, Raghuvanshi S, Rawat J. Transbronchial lung biopsy in patients with diffuse parenchymal lung disease without 'idiopathic pulmonary fibrosis pattern' on HRCT scan - Experience from a tertiary care center of North India. Lung India 2015;32:453-6.

Place :

Date :   **Signature of Co Investigator**