Contents

A. General Information

1. Introduction

Biotechnology is growing in exponential trend due to its wide application in the areas as diverse as agriculture, animal husbandry, environmental management, wild life conservation, human health, disease diagnosis, medicine, drug discovery, pharmacology, biomedical engineering, bio-signatures, biosensors, prediction and molecular simulation, gene regulation and transcriptomics, bioinformatics and computational biology, nutritious food and in industries making biotechnological products. Universities are source of knowledge which produces the skilled human resources for the nation. Tribhuvan University realized the importance of biotechnology in Nepal and endorsed Central Department of Biotechnology under Institute of Science and Technology (CDBT-TU) in the line of its VMGOs with the intense effort of the then Dean Prof. Dilli Devi Shakya in the year 2008. It is located at Tribhuvan University Compound in Kirtipur Municipality of Kathmandu valley of Bagamati Province. The Department is within the Science Block close by the Central Library of the university in the premises of Physics-Chemistry-Computer-Biotechnology complex. By now, it has completed its 13 years existence since the first bell of class commenced on Baisakh 23, 2066 (May 6, 2009). CDBT-TU commenced the Ph.D. in 2011 and Postdoc in 2017. CDBT-TU currently, is a family of 11 faculties (2 on leave) and 9 non-teaching staffs, however, some part-time faculties and staffs are also bonded in the team to build the Department.

The flow of students to appear in the M.Sc. Entrance Exam is more than four times to its capacity. The fee structure for M.Sc. course is comparatively cheap. Pass rate of students is 100%. The efforts put forth by all the faculties, staff and students are commendable in it's growth.

The Department is still running in the same occupied space of about 6690 sq ft area where it was initiated its course which has now become consisted with its remarkable growth. However, the new building is yet to be hand overed to the Department administration. Tribhuvan University supported the construction of Department's own building and is now at the verge of completion. The built ground floor space of about 11989.89 sq ft in the new building is still not sufficient for shifting all the programs of the Department. Currently, Department adjusted the 1/3 of the space to it's Corona Laboratory.

Research laboratory expansion initiated from 2017 anticipating innovative researches in various fields of biotechnology. It is a natural process that any birth or establishment gradually grows with appropriate and timely facilitation of its requirements. In the course, it has started to achieve the name and fame within the circles of science and technology. Most importantly, it did memorable and commendable tasks exploiting the knowledge of biotechnology during the outbreak of covid-19 pandemic era when country was direly looking for biotechnologist. Establishment of Government approved "KM TU-Biotech Corona Laboratory" is an activity to be loudly voiced. In the year 2021, Ministry of Education, Science and Technology, Government of Nepal awarded "Achievement Award for Pandemic" recognizing Department's commendable effort during Covid-19 pandemics.

1.1 History

Tribhuvan University Executive Council's meeting with decision no. 124 of the date December 07, 2007 (2064/8/24 BS) is the day of decision for establishment of Central Department of Biotechnology under Institute of Science and Technology of Tribhuvan University. The M.Sc. course was planned to run in semester system which was the first M.Sc. semester course in IOST. The Institute of Science and Technology did not have separate building for the newly established Department so it managed the ground floor with some rooms which were planned for Central Laboratory of Science within the Physics building complex and had not been used then was allocated for the Central Department of Biotechnology. As endorsed by Academic Council of Tribhuvan University, the Department commenced the M.Sc. in Biotechnology course from the day May 6,

2009 (Baisakh 23, 2066). Since biotechnology is a technical subject, the learning of lab skills is the most indispensable for the students who join the course. So, an ample working space with availability of costly reagents were challenges. It defined very limited seat-quota of 24 students for admission. The course syllabus designed at that time were taught for 3 years and then revised thoroughly in 2012 and then minor revisions were made in 2016 and 2019 to keep updated in the field of Biotechnology, however, revision process is at the end but could not completed due to covid which will be done in near future. The success in running the course encouraged the CDBT-TU team to commence Ph.D. course in December 4, 2011 (2068/8/18) which was jointly registered with Nepal Academy of Science and Technology (Dean's office date 2068/8/18 Ref no. 282/2068-069). The well going of the academic course and strengthening of laboratory facility with collaborative research grant open rooms for Postdoc in 2018 which is again the ever first time of Postdoc program provisioned in IOST-TU. Thus, many of the systems were developed and biotechnology course rooted in the first phase and popularity were notably improved equipping with Real Time RT PCR in the second phase while Department leapt to the par of international standard with highly advanced laboratory. A world reputed project in the third phase transformed it to a Model Department of the university. A postdoc has also completed research work in the Department. As planned the Department now has been a model Department with notable achievements as bulleted below

- First choice for students to enroll in Bio-science M.Sc. course.
- The best Bio-science laboratory in academic institutions
- Prestigious national and international projects on hand.
- An extension of fully functional Corona Laboratory
- Availability of high-performance test facilities for bio-science researchers.
- Sustainable strategy for running the advanced equipment.

Since its inception, CDBT-TU has been nurtured by three Heads of the Department

1.2 Leaderships of CDBT-TU

Head of the Departments	Dept. Joining	Date of Leading
Dr. Tribikram Bhattarai, Acting Head & Assoc. Prof.	2064/10/15	January 29, 2008 (2064/10/15)
Dr. Tribikram Bhattarai, Head & Assoc. Prof.	(January 29, 2008)	December 18, 2008 (2065/9/3)
Dr. Rajani Malla, Head & Assoc. Prof.	2065/1/9 (April 21, 2008)	December 18, 2012 (2069/9/3)
Dr. Krishna Das Manandhar, Head & Prof.	2066/7/6	December 18, 2016 (2073/9/3)
Dr. Krishna Das Manandhar, Head & Prof.	(October 23, 2009)	December 18, 2020 (2077/9/3)

The joined hands of efficient manpower in the field of biotechnology and proper strategies set by Tribhuvan University with provision of good research budget allocation can make it possible to further harness the benefit of the accumulated knowledge. Department has envisioned to develop the existing space as a strong research wing of Central Department of Biotechnology which would be



Prof. Tribikram Bhattarai	Prof. Rajani Malla	Prof. Krishna Das Manandhar
[2065 Poush 03 – 2069 Poush 02]	[2069 Poush 03 – 2073 Poush 02]	[2073 Poush 03 – 2077 Poush02-Till date]

Tribhuvan University's a MODEL LABORATORY. Faculties and students have completed many projects and currently, there are ongoing five international projects and three national projects in the Department. The projects run by the faculties mentioned in this report are of huge help to produce skilled human resources in biotechnology. The course of CDBT-TU development is based on it's Vision, Mission, Goal and Objectives.

B. Institute Shaping Guideline

2. The Vision Mission Goal and Objective Of CDBT-TU

Vision

World class Biotechnology institute for serving lives and nature.

Mission

1. Central Department of Biotechnology is a technical academic entity with facility of all infrastructure
2. Central Department of Biotechnology is a Academic Centre of Excellence comprising highly motivated faculties
3. Central Department of Biotechnology is a Research Centre of Excellence in biotechnology.

Goals

- Well-furnished academic and research institutional space comprising beautiful surrounding environment within safe and protected premises for advance brian storming of biotechnology
- Availability of required Academic, Adminstrative and Research and extra curricular activity purposive spaces
- Economically viable institute through biotechnology
- Standardized data management system of Institute for sharing information with stakeholders
- Established CDBT as the first choice of bioscience study and teaching in post graduate and PhD course for the eligible candidates

Prof. Krishna Das Manandhar, Head of CDBT-TU at work

- Equipped institutional laboratory as a nation's model academic laboratory of biotechnology for teaching-learning
- Source for competent salable human resources in biological science for national and international market.

- Equipped biotechnology laboratory as the nation's model sophisticated advanced laboratory of biotechnology for world competent research activities
- Emphasized research activities on different aspects of biotechnology encouraging its faculties mobilizing its research scholars/students
- Potential institute for publication of high impact original scientific research articles.
- Department with project run laboratories "At least one faculty one international project"

Objectives

- Protection and beautification of the well-furnished premises with alluring academic/research spaces.
- Provide comfortable accommodation for faculties, non-teaching staff and students for better performances.
- Facilitate with required ECA activities.
- Opt resource generation activities in the institutes through biotechnology
- Overall development of faculties, staffs and students.
- Develop computerized management system and share the adequate information with stakeholders
- Enrollment of competent postgraduate and PhD students
- Accomplish exemplary biotechnology teaching course
- Access sufficient equipment for teaching-learning
- Quick absorption of graduates in relevant professional institutions
- Enrich laboratories with highly sophisticated equipment
- Improve capability development for innovative national/international research projects according to the specialization of faculties
- Enrollment of skilled postdoc and researchers in the projects
- Cultivate scientific knowledge, skill and innovative ideas.
- Publication of original research articles in high impact factor cited journals.
- Ensure 'At least one faculty - one funded research project'.

C. Central Department of Biotechnology at the turmoil of World Covid-19 pandemic

3. Covid-19 and the Academic sessions

Department was on the way of educating 10th and 11th batch students while Covid-19 outbreak knocked our country. Nation went to lockdown-mode as of the whole world. There was serious concern of session loss. In order to mitigate the possible academic session loss, Tribhuvan University, within few weeks of the nationwide lockdown, decided to run the online classes. Following a few formal training sessions and rigorous self-training by the faculties, the department initiated its online theory classes in the first week of Baisakh, 2077 and continued it's smooth operation. The whole theory classes including the assessments of the 11th batch first semester students were conducted online. That

ease situation during covid pandemic

was a new yet successful approach to all of us. There was still challenge to conduct practical classes which was also overcome by carrying the experimental works in small groups with all safety measures including facilitation of face-shields.

4. Covid battle of Department and an extension program

4.1 Kirtipur Municipality TU Biotech Corona Laboratory

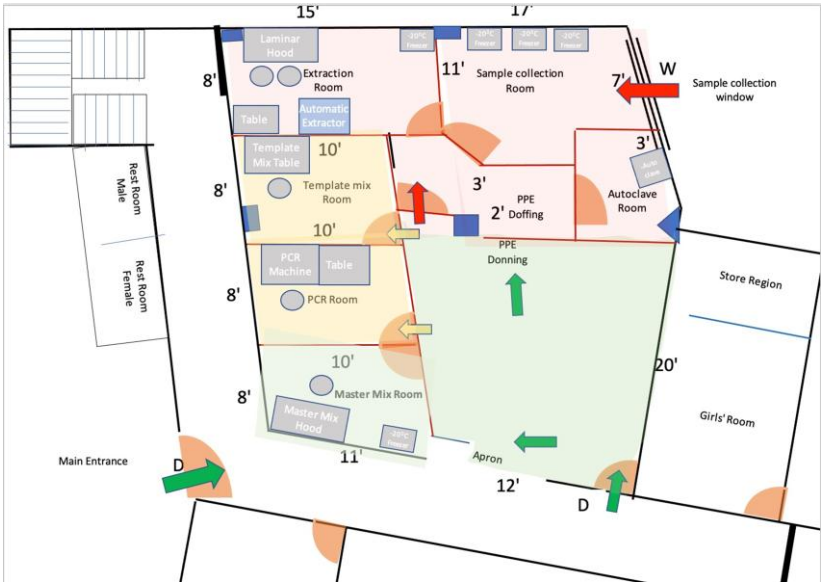
The first case of covid was diagnosed in Dec. 30, 2019 in Wuhan of China and reached as a first case to Nepal on January 13, 2020 as detected in a Singapore Laboratory. The situation became desperate to the Government and the people that country did not have Real Time RT PCR test facility except only in very few institutions and furthermore 2/3 hand-full laboratory had skilled human resources and functional laboratory. CDBT-TU is one of the first institution which released a statement that we have Real Time RT PCR and skill human resources to help the Government in diagnosis and other supports on Chaitra 10, 2076. The chronological developments then after are listed below

2076-12-10	Release of statement of CDBT-TU strength for PCR test for Covid-19
2077-12-23:	Visit of Mayor and Deputy Mayor to CDBT-TU lab and discussion with Kirtipur Municipality for collaborative laboratory initiation
2076/12/24 (April 6, 2020)	Corona Laboratory site fixed to TU Blood Transfusion Center
2077-1	With support of KM Preparation of laboratory spaces Installation of all required instrument (June4,2020 2077/2/22- Laminar hood market survey with mayor)
2077-2-29 (June 11, 2020)	Strategy discussion and Good Laboratory Practice instruction by Rajindra Napit
2077-3-5	Inauguration of laboratory by VC Prof. Dharma Kanta Baskota
2077-3-6	RT PCR machine showed error and could not be operated
2077-5-	KM initiated purchase procedure of RT PCR machine
2077-5-20	Optimization of PCR result approved by NPHL and diagnostic test commenced
2077-5-21 – 2077-11-29	The first wave completed and tested 4097 samples tested
2077-12-01- 2078-6-30	The second wave. Tested 20216 Samples
2078-6-30	TU-Blood Transfusion Center ask to vacant the space for their purpose
2078-8-16 (Dec 2, 2021)	Shifted the laboratory to the new building of CDBT-TU
2078-8-22 (Dec8, 2021)	Service initiated from new building of CDBT-TU
2078-07-01– 2078-12-30	The third wave. Test continued.

Hence, CDBT-TU and it's biotechnologists served and continuously serving the nation with full capacity. Its graduates not only served in its territory but also help other many nation's institutions when country was looking for skilled graduates. The incident changed the concept that the disease diagnosis is possible only in the hospitals and diagnostic laboratory but the university's research laboratory is ahead there.

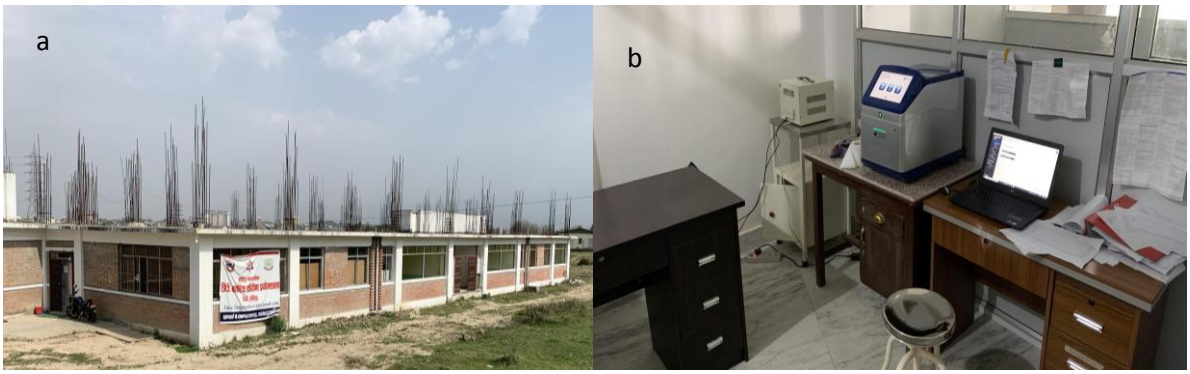
4.2 Corona Laboratory in its own new Building: An achievement to CDBT-TU

The moment, when the laboratory set-up site (TU Blood Transfusion Center) authorities requested CDBT-TU to shift the well-functioning laboratory in short notice, was the most painful time to the Department as the achievement made by its huge efforts could go to vain. With the unified efforts of Department's administrative



Detailed sketch of laboratory at CDBT-TU's own new building design for SARS Cov-2 diagnosis

staffs and faculties, the Head of the Department in coordination with Tribhuvan University authorities, Kirtipur Municipality, concerned Government offices and the contractor of New Building materialized the shift of the laboratory from the previous location to its own new building as permanent set up. Department is thankful to Mr. Mahadev Bista for taking care of the laboratory as the Laboratory In-charge. A detailed sketched design was prepared and approved for the highly contagious infectious disease diagnosis laboratory to avoid any sort of lacunae and get approval from National Public Health Laboratory, Ministry of Health and Population, Government of Nepal.



Kirtipur Municipality TU Biotech Corona Laboratory a. Laboratory at CDBT-TU's new building. B. RT PCR lab of the corona Laboratory. C. Prof. Manandahr with the Lab team. d. Sample collection site.

4.3 Kirtipur Municipality TU-Biotech Corona Laboratory Team

Director:	Prof. Krishna Das Manandhar	HOD, CDBT-TU/Lab Chief- IDVR Lab
Technical Chief:	Alina Shree Sapkota,	Asst. Prof., Med. Biochemistry, CDBT-TU
Lab In-charge:	Mr. Mahadev Bista,	Biotechnologist, CDBT-TU
Technician:	Mr. Suresh Joshi,	Biotechnologist, CDBT-TU
	Mr. Sudeep Adhikari,	Biotechnologist, CDBT-TU
	Ms. Guheshwori Chataut,	Biotechnologist, CDBT-TU
	Ms. Suruchi Karna,	Biotechnologist, CDBT-TU
	Ms. Sushma Sharma,	Biotechnologist, CDBT-TU
Utility Staff	Ms. Matina Tamang	
Night guard	Mr. Guna Nidhi Dhakal	CDBT-TU
Admin Chief	Mr. Rabindra Maharjan	CDBT-TU
Account Chief	Mr. Ujjwal Man Pradhan	CDBT-TU
Store	Mr. Madan Rokaya	CDBT-TU

4.4 A breakthrough: SARS Cov-2 variant test at CDBT-TU

CDBT-TU did not limit to the diagnosis of Covid-19 but stepped ahead by detecting the circulating SARS CoV-2 variant using Illumina MiSeq Next Generation Sequencer during the second and third wave of the havoc pandemic covid situation. At that time, Department was the first to use the high through put sequencer to identify the Alpha, Delta, Delta Plus and Omicron SARS Cov-2 variant which have been uploaded to GSAID. Department is, hence, preparing high skilled human resources for biotechnology-based molecular laboratories and industries which not only create high skill jobs but also uplift the national economy and development.

b

NGS Laboratory a. Prof. Manandhar and students working for library preparation. b. PhD and M.Sc. Students at work for SARS Cov-2 variant test.

D. Quality Assurance Sustainability

5. Quality Initiatives of the Institution

CDBT-TU is the first Central Department of Tribhuvan University to be a QAA certified Department. The department received Quality Assurance and Accreditation (QAA) certification from University Grants Commission (UGC) on 22nd November, 2018. Annual reporting could not be happened due to the Covid-19 pandemic commenced in the world from December 2019 for the year 2020 and 2021. The pandemic has been eased in the year 2022 and Department is looking forward to welcoming the EQAAC team from QAA division of UGC.

QAA Certificate received by CDBT-TU on Nov. 22, 2018 (2075 Mangsir 6)

5.1 Bench marks achieved for quality sustainability

Milieu: Central Department of Biotechnology established in 2008 AD under Institute of Science and Technology, Tribhuvan University, Nepal. Tribhuvan University with aim for a leading role in fulfilling the national demand and also to start innovative researches in various fields of biotechnology. The curriculum of Master level in biotechnology has been formulated considering the need of the current nation's requirement as well as to meet the international standard in the subject. It is a technological

professional manpower preparation program as of other Institute of engineering, Institute of agriculture & animal Science, Institute of Medicine and Institute of Forestry programs of Tribhuvan University.

Teaching-Learning Milestone: The teaching faculties are dedicated and are experienced with good exposure to international research. In support to the full-time teaching staffs, many senior faculties/experts from government, non-government, private and free lancers are contributing for the best teaching-learning pedagogy of the Department. Students who enrolled and appears in the examination are the skilled graduate receiving good scores.

Science Infrastructure: At its initial phase, Department formulated the teaching-learning systems and continued till date. The basic needs were the primary requirements to carry uninterrupted class routines and scheduled examinations to achieve the academic standard performances. Revision of curriculum were carried in between. In the year 2015 with the support of Second Higher Education Project (SHEP)-UGC, TWAS and Humboldt Department put steps to upgrade the laboratory facilities equipping with basic -80^{0}C freezer, spectrophotometer, PCR, RT PCR, Fluorescent Microscopes, Lyophilizer, BSL-2 hood etc. Mean time Department prepared the first five-year plan on 2016 and planned for upgrading the research activities. The year 2017, Department received a BD FACSCaliber Flow cytometer as a gift from National Institute of Health Science (NIH), USA which has been a turning point for advancing the research strength of the Department. Since then, Department has not look behind till date for establishing CDBT-TU as the most advanced academic institution with high-end instruments like Illumina MiSeq Next Generation Sequencer, Agilent Bioanalyzer, Agilent HPLC (RI & PDA detector), Beckman Coulter Ultracentrifuge, BioRad RT PCR and PCRs, Super computer, Milli-Q water (Type I and Type II), Thermo Nano Drop, Power Backup (12 kVA), Cooling Centrifuge and other many more instruments like BOD incubator, incubators, Microtitre plate cooling centrifuge etc. Higher education in science with such advanced equipment is definitely give the glimpse of international laboratory. The laboratories are well functioning to keep the quality of practical courses and research in the Department.

Research Projects: The laboratory infrastructure alone is not sufficed for the sustainability of academic institute. So Department in five-year plan insisted its faculties to apply for the grants to achieve the target "At least one faculty one Project (international)". The aim has been achieved in the year 2019 having either national and/or international projects. It is matter of proud for the Department that a prestigious multi-annual international NIH grant is ongoing since 2020 May. Many of the Master and Ph.D. students are hugely benefited by the project. It is amazing that due to the satisfactory work performance of the Prof. Manandhar's NIH-U01 project, CRDF Global fund of US agreed to donate USD. 60,000.00 (USD Sixty thousand) to the Department in kinds viz. Milli-Q Ultrapure Water System, 12 kVA power backup and SARS Cov-2 variant test kits. In last five years, it has 3 national and 7 international grants. The output product skill is now at the par of quality due to the ongoing projects.

Student support: The M.Sc. and Ph.D. graduates focuses in different activities according to their courses of the development of biotechnology. Students are supported according to their supervisor's projects in research and developmental areas of basic/applied biotechnology which can play roles for economic growth of nation and for the prosperity of the people and they are expected to contribute in various important fields like agriculture, medicine, animal science, forestry and in production and service industry. Students have been closely working with industries. Besides, their issues are listened and addressed through committees like Students' Support and Grievance committees. Hence, the academic achievement has gained the mark.

Data management and information sharing: The department has well-functioning EMIS, which keeps all the departmental information like data of students, teaching and non-teaching staff, store data, and various activities going on in department. Recently, KOWA library software has been installed to keep the library system updated. Department remains open in almost all the aspects of its activities. Many ways of sharing have been adopted like; social media, webpage, prospectus etc. The Department is heading in its academic and research excellence with ambitious academic goal.

To summaries, Department is awaiting handover of the newly constructed its own building in which all required facilities for development and knowledge advancement are ensured inching towards 'Center of Excellence'. Central Department of Biotechnology, Tribhuvan University bridges and links its advances with industries there by utilizing national natural resources. To accomplish above objectives, collaborations with both national and international academic and research institutions are equally prioritized. By now, the Department has been recognized in the national and international arena as a lively bio-science institution. All the CDBT family is working hand to hand for the wonderful future of the biotechnology in the nation. Central Department of Biotechnology (CDBT) is publishing Annual Report regularly to mark its anniversary. The report includes various activities carried out by the department in the last fiscal year.

E. Human Resources

6. Faculty and Administrative Staffs

6.1 Full-time teaching staff members

The Central Department provisioned for 18 faculties and 10 staffs for administrative, technical and supportive section. Presently, it has eight full time faculties on duties, two full time faculties are on study leave and a faculty is deputed to UGC as Director of Research Division. Among the 8 faculties, a faculty has joined postdoc in US Maryland University for two year and next is going to International Center for Genetic Engineering and Biotechnology (ICGEB), Triesty, Italy for a three-month training in bacteriology. So, the full-time faculty will be 6 involved in teaching-learning activities of the Department in near future.

Table : List of faculties

SN	Name of Faculty	Designation	Status/ Responsibility	Highest Academic Qualification
1	Prof. Dr. Krishna Das Manandhar	Professor	Head	Ph. D. (Immunology/ Animal biotechnology)
2	Prof. Dr. Rajani Malla	Professor	Former Head	Ph. D. (Microbiology)
3	Dr. Pramod Poudel	Associate Professor	Deputed to UGC	Ph.D. (Agriculture)
4	Dr. Jarina Joshi	Lecturer	Admin Support	Ph.D. (Bioprocess)
5	Bal Hari Poudel	Lecturer	Ph.D. leave	M.Sc. Biotechnology
6	Dr. Smita Shrestha	Lecturer	Ph.D. submission	B.V.Sc/M.Sc. (Medical Biotech)
7	Pragati Pradhan	Lecturer	Training May-July 2022- ICGEB	M. Sc. (Biochemistry)
8	Dr. Suresh Subedi	Lecturer	-	Ph. D. (Bioprocess)
9	Preeti Regmi	Lecturer	Ph.D. leave	M. Sc. (Biotechnology)
10	Alina Shri Sapkota	Lecturer	Academic Support	M. Sc. (Biochemistry)
11	Dr. Birendra Pd. Gupta	Lecturer	Postdoc leave July	Ph. D. (Virology)

			onwards	

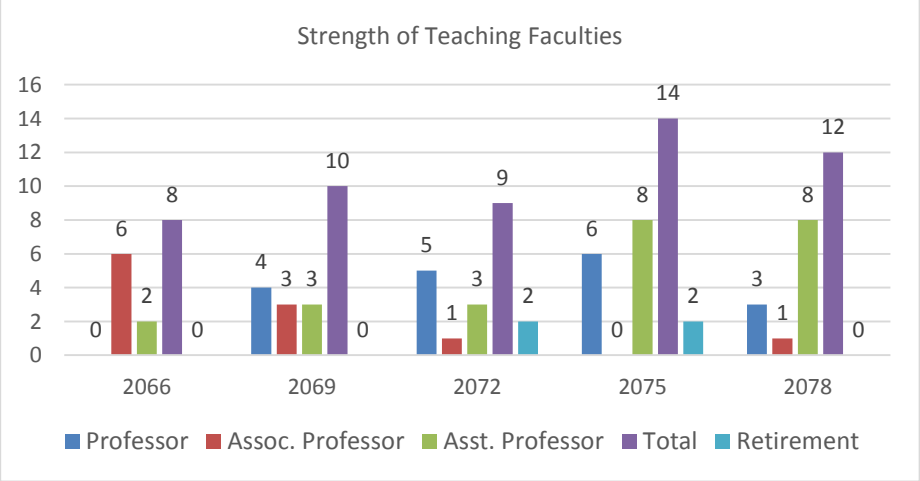
6.2 Retired Professor

Prof. Ganga Kharel retired on 2078/12/2 after his 12+ years dedicated contribution in the Food Biotechnology of the Department. Prof. Kharel has been a strong backup support in academic as well as administrative part of the Department. Our best wishes to Prof. Kharel for a very wonderful days ahead in his retired life.

6.3 Visiting faculties

Table : List of visiting faculties as experts (Part-time)

SN	Name of Faculty	Designation	Status	Highest Academic Qualification
1	Dr. Tribikram Bhattarai	Professor	Former Head	Ph.D., Plant Biotech
2	Dr. Gauri Shankar Manandhar	Professor	Teaching & Research	Ph. D. (Cell biology)
3	Dr. Pramod Aryal	Research Scientist	Research	Ph. D. (Genetic Eng.)
4	Dr. Bhusan Shrestha	Visiting faculty	Teaching & Research	Ph. D. (Agri. Biotech.)
5	Dr. Umesh Mandal	Visiting faculty	Teaching	Ph. D. (Animal Biotech)
6	Dr. Sarbesh Das Dongol	Visiting faculty	Teaching	Ph. D. (Agri. Biotech)
7	Other Faculties	Temporary	Teaching	Different Subjects



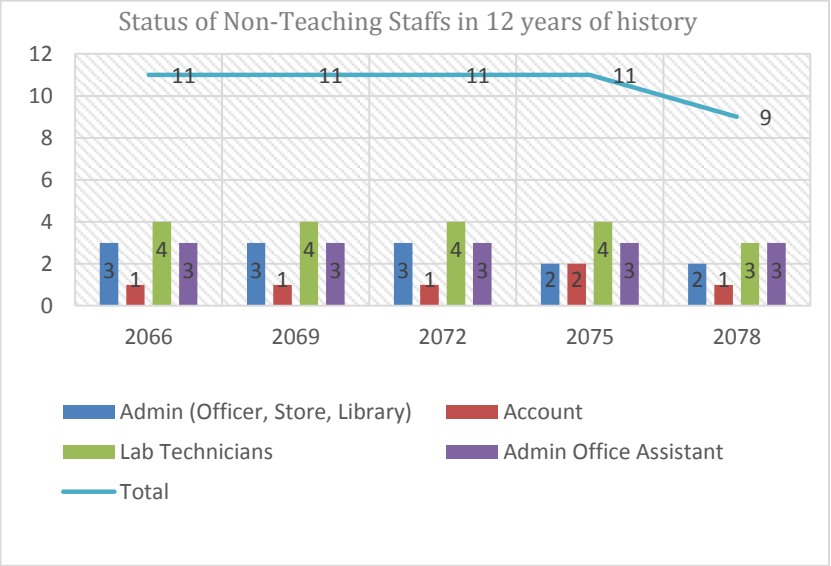
Numbers of faculties at every three-year span from start to the year 2078

6.3 List of Non-teaching staffs

Table: List of non-teaching staffs

SN	Name of Staff	Post	Status
1	Mr. Rabindra Maharjan	Section Officer	Permanent
2	Mr. Ujjwal Man Pradhan	Account Officer	Permanent
3	Mr. Madan Man Singh Rokaya	Head assistant	Permanent
4	Ms. Elen Pradhan	Head Lab assistant	Permanent
5	Ms. Til Kumari Gautam	Technical lab assistant	Permanent
6	Ms. Binu Tamang	Technical lab assistant	Permanent
7	Ms. Subha Maya Magar	Support staff	Permanent
8	Ms. Maiya Khanal	Support staff	Permanent
9	Mr. Guna Nidhi Dhakal	Support staff	Permanent

10	Mr. Rajendra Maharjan	Daily wages- Technical (Electrician)	Part time
11	Mr. Pan Bhai	Daily wages- Rest room maintenance	Part time
12	Mr. Lalit Gurung	Daily wages- Gate keeper	Part time



Numbers of non-teaching staffs at every three-year span from start to the year 2078

F. Physical Infra structure

7. Physical Strength/Infrastructure

7.1 Research Equipment Strength of Department

The CDBT is equipped with all basic equipment necessary for M.Sc. biotechnology practical works. Some major equipment installed in the department explains its high efficiency in the scientific research work of present-day world and gives the glimpse of laboratory of developed countries. Still the most advance equipment are sought and department will keep its pace in the course of time.

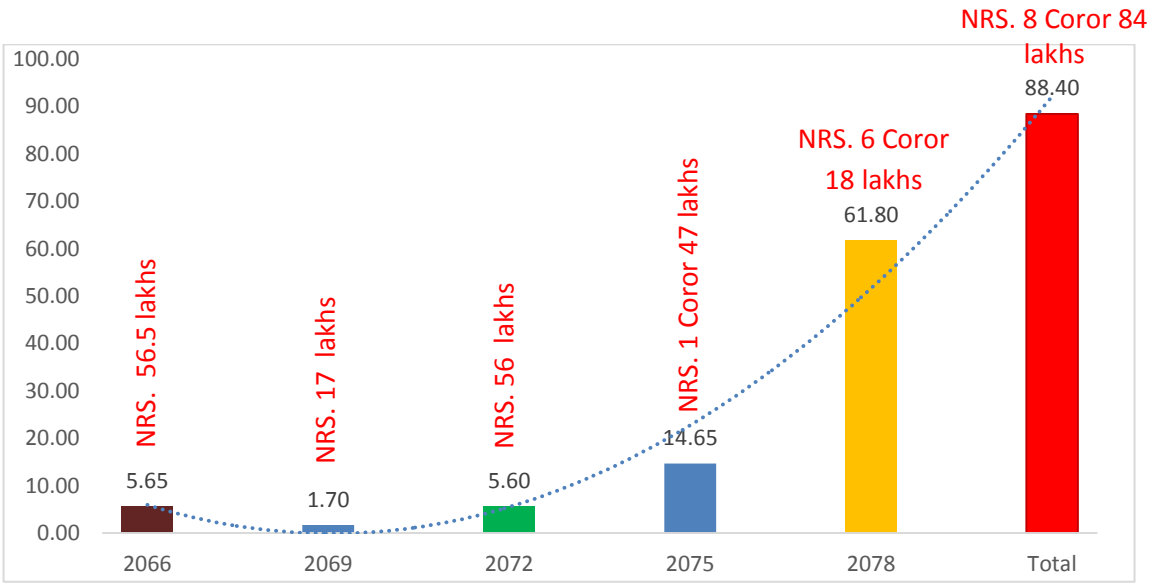
In last three years, department purchases 19 major equipment which has uplifted the standard of biotechnology to the mark. The tentative present market price of the equipment are listed in the following table (may not be accurate to the purchased cost) to see the laboratory's investment in major instrumentations. It showed around worth of 90 millions.

Table: List of major instruments available in the Departmental laboratory

Year	Instrument	Funding Agent	Fund of Institute / Project PI	Tentative cost (Rs. Million)
2066	1. -40 Freezer,	CDBT-TU Est. Budget	IOST-TU	0.5
	2. Fermentor (Electrolab)	CDBT-TU Est. Budget	IOST-TU	1.8
	3. Growth Chambers,	CDBT-TU Est. Budget	IOST-TU	0.2
	4. Electrophoresis units,	CDBT-TU Est. Budget	IOST-TU	0.2
	5. Blotting units,	CDBT-TU Est. Budget	IOST-TU	0.05
	6. BSL2 laminarhood,	CDBT-TU Est. Budget	IOST-TU	0.4
	7. ELISA plate reader,	CDBT-TU Est. Budget	IOST-TU	0.2
	1. PCR,	CDBT-TU Est. Budget	IOST-TU	0.3
	2. CO2 incubator,	CDBT-TU Est. Budget	IOST-TU	0.6
	3. Spectophotometer (Thermoscientific),	CDBT-TU Est. Budget	IOST-TU	0.2
	11. Growth Chambers (Eliete/Sonar)	CDBT-TU Est. Budget	IOST-TU	1.0

	12. Phase Contrast Microscopy	CDBT-TU Est. Budget	IOST-TU	0.2
2067	1. BOD incubators, 2. Gene Electroporator	CDBT-TU CDBT-TU	CDBT-TU CDBT-TU	0.2 0.1
2068	1. Incubator 2. 4^0C Refrigerator	CDBT-TU CDBT-TU	CDBT-TU CDBT-TU	0.1 0.1
2069	1. Water Purification System 2. Laminar Flow (2 units)	CDBT-TU CDBT-TU	CDBT-TU CDBT-TU	0.2 0.2
2070	1. Solar Back up System (3kVA)	IRLAPS- IOST/UGC	IOST Dean Office	1.0
2071	1. Gel Doc (MS Major), 2. Rota evaporator (IKA)	IRLASP-IOST/UGC KRIBB-ESON-CDBT	IOST Dean Office Prof. Manandhar-	0.35 0.3
2072	1. -80 Freezer (GFL) 2. Cooling centrifuge(Hi-tech), 2. Fluorescent Inverted microscope(Zeiss) 3. ELISA Plat Washer(Makit0…..) 4. PCR (BioRad) 5. Spectophotometer (Chemito)	TWAS TWAS TWAS CDBT-TU CDBT-TU TWAS_CDBT-TU	Prof. Bhattarai Prof. Bhattarai Prof. Bhattarai CDBT-TU CDBT-TU Prof. Bhattarai	1.0 0.8 0.5 0.35 0.5 0.8
2073	1. Real Time RT PCR(BioRad) 2. Flourescent Compd Microscope(Bell) 3. Lyophilizer (ZIRBUS) 4. Nanodrop (Shimadtzu) 5. Cell Coulter (Elumina) 6. BSL2 Biosafty cabinet (BioBase)	TU - HERP/UGC TU - HERP/UGC TU - HERP/UGC TU - HERP/UGC TU - HERP/UGC TU - HERP/UGC	CDBT-TU CDBT-TU CDBT-TU CDBT-TU CDBT-TU CDBT-TU	0.5 0.8 1.0 0.7 0.1 0.6
2074	1. Flow Cytometer (BD), 2. Shaking incubator (Nanyog)	NIH-USA [Dr.Willium Telford TU - Planning	Prof. Manandhar CDBT-TU	10.0 0.3
2075	1. Cooling centrifuge (Yingeai), 2. Chiller Rota evaporator (JKA) 3. BOD Incubator (Optics Technology)	US Spark Grant-Dengue Project UGC CRG UGC_ CDBT-TU	Dr. Melanie/ Prof. Manandhar Prof. Rajani Malla Dr. Jarina Josi	0.3 0.2 0.15
2076	1. PCR (BioRad) 2. Chiller for rotaevaportor 3. Real Time RT PCR (Azur-Covid lab) 4. BSL-2 Cabinet (Singapore-Covid lab) 5. Super Computer (Bioinformatics lab)	Karius-LJI Dengue UGC-CRG Grant Kirtipur Municipality Kirtipur Municipality NIB bank	Prof. Manandhar Prof. Malla CDBT-TU CDBT-TU Dr. Aryal	0.5 0.2 2.5 1.2 0.5
2077	1. -80 Freezer (ThermoFisher) 2. BSL-2 cabinet (ESCO) 3. HPLC (Agilent) 4. Freezers 5. Ultra Centrifuge (BeckmanCoulter)	UGC-RMF TU UGC-RMF TU UGC-RMF TU UGC-RMF TU DLI-1 QAA	UGC_CDBT-TU UGC_CDBT-TU UGC_CDBT-TU UGC_CDBT-TU UGC	1.2 1.0 6.0 0.2 10.0
2078	1. Next Gen Sequencer(llumina MiSeq NGS) 2. Real Time RT PCR (Opus) 3. Nanodrop (Thermo), 4. Bioanalyzer (Agilent), 5. Super Computer (TIVDRL) 6. Super Computers (Bioinformatics lab)	UGC-RMF TU UGC Lab Innovation UGC Lab Innovation UGC Lab Innov Grant NIH-U01 FUO Grant Nepal Gov-NIB bank	UGC_CDBT-TU UGC_CDBT-TU UGC_CDBT-TU UGC_CDBT-TU Prof. Manandhar Dr. Pramod Aryal	20.0 2.8 1.5 7.0 0.7 0.7

	7. MilliQ Water system (MilliQ)	CRDF Global Fund	Prof. Manandhar	2.5
	8. Power Backup- 25 kVA (Voltas Battery)	CRDF Global Fund	Prof. Manandhar	2.5
	9. Automatic Nucleic Acid Extractor	Health Service, Nepal Governemn	Covid Lab- Mr. Mahadev	0.8
Tentative current price of the major equipment in the Department			Total	88.4



Instrumentation investment at CDBT-TU at every three-year span from start to the year 2078

7.2 Physical Facilities

The CDBT though a new department of Tribhuvan University it is equipped with the modest to sophisticated instrumental facilities necessary to run the basic and advanced research on the different disciplines of biotechnology. CDBT-TU is currently running in the rooms provided by Institute of Science and Technology, Tribhuvan University which were primarily designed for Central Instrumentation for Science and Technology.

Sections of Buildings	Numbers
Lecture Hall/ Seminar room	2 (One added this year)
Administrative rooms / Account section	3
Store room	2
Library	1
Fresh room	1
M.Sc. laboratories Immunology and Microbiology/Medical Biotechnology/ Bioprocess Cell Biology and Genetics/Animal Biotechnology/ Food Biotechnology Bioinformatics	2
Research laboratories BSL-2 cell culture /Virology Flow Cytometry Next Generation Sequencing Bacteriophage/Streptomyces HPLC/ Bio-fuel Engineering Milli-Q Type I and Type II	6

Molecular Biology/ Genetic Engineering	
Total	**17**

It is obvious that the spaces are not enough for advance scientific equipment in the Department so it is managing the lack of spaces by sharing the available rooms for necessary purposes. However, the new building is the hope.

7.3 Planning for extension

The new building has only the ground floor in this first phase of construction. Final finishing of the construction is under way. Still due to urgency requirement to shift the Department-Run Kirtipur Municipality TU Biotech Corona Laboratory established in TU Blood Transfusion Center, Department with huge effort could shift the lab to the portion of the new building. It has currently occupied 3 rooms. Department has following provisions in the new building

The new Biotech Building will comprise

- Theory Class Rooms - 2
- Practical Class Rooms - 2
- Central Instrumental Room - 1
- Meeting room - 1
- Seminar Hall -1
- Store Room - 1
- Teachers Room - 1
- HOD Room - 1
- Administration/Account Room - 1
- Library - 1

In the new building, department is planning to shift the entire infrastructure required for M.Sc.

Biotechnology course. The existing space will be used as research laboratory where the researchers, faculties, Postdocs, Ph.D and M.Sc. thesis students will work. We hope to move to this new building with beautiful and well-equipped research facilities very soon.faculties, Postdocs, Ph.D and M.Sc. thesis students will work. We hope to move to this new building with beautiful and well-equipped research facilities very soon.

New Building sketch (a). Site-map of planned Central Department of Biotechnology with its surrounding area (b).

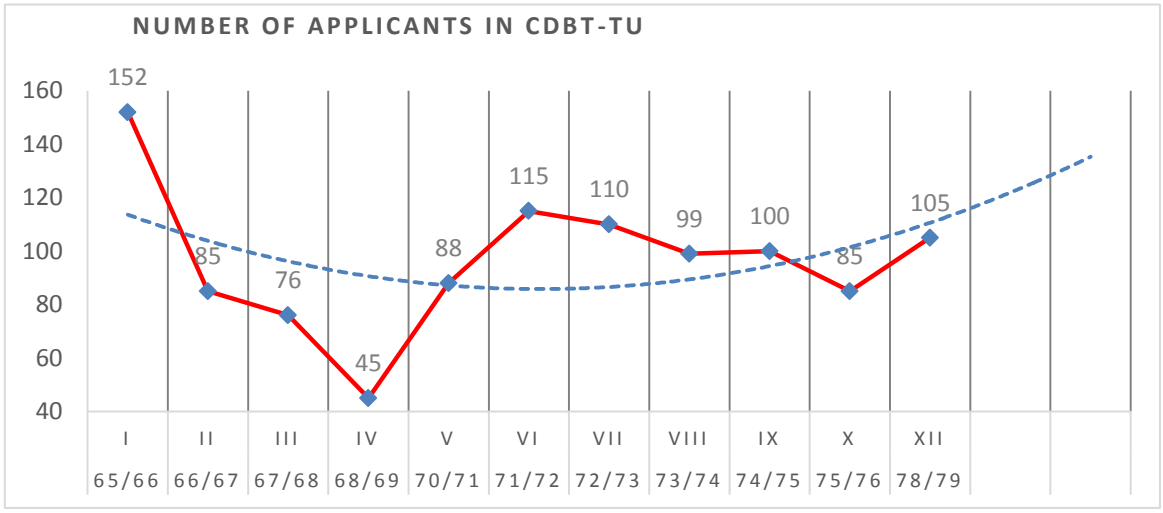
G. Academic and Research Projections

8. Academic Progress:

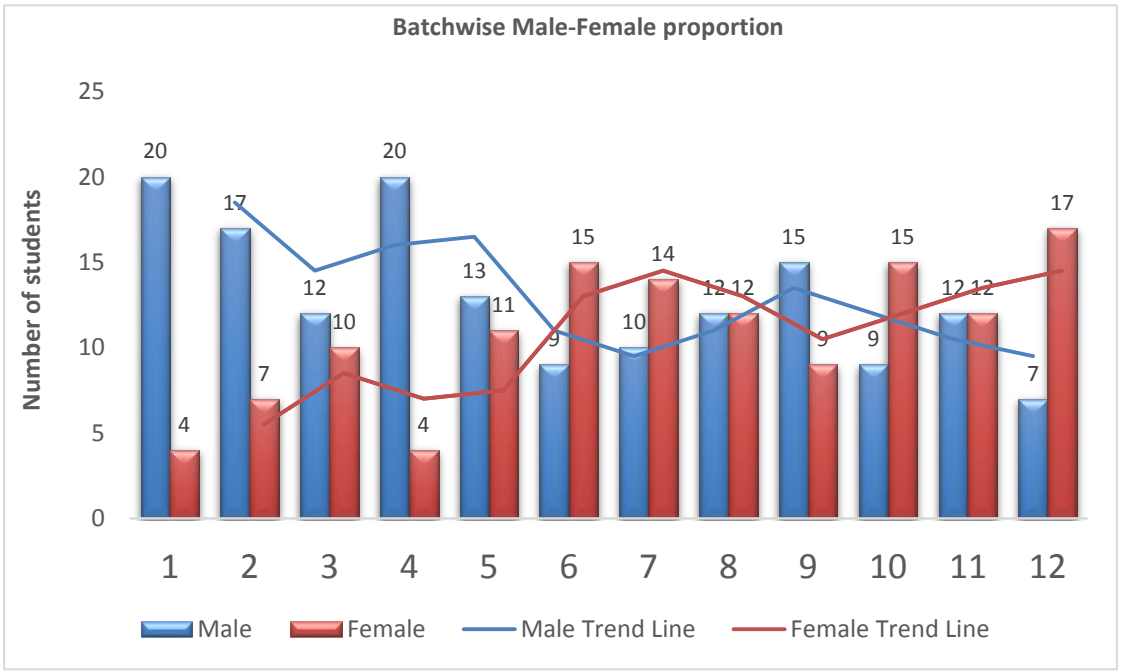
The department is continuing the provisions for student enrollment in **M.Sc./ PhD** degree course and **Postdoc** program. The M. Sc. in biotechnology, a four semester (2 years) program, emphasizes both theoretical and practical aspects of different fields of Biotechnology. M. Sc. thesis is a research works

assigned to each student under the supervision of a faculty member in the fourth semester. Ph.D. scholars are carrying national issues for their topics and utilizing the facilities available in the Department. A post-doctoral researcher joined in 2017 and com pleted her 2 years' research supported by UGC research grant. In addition, the students are encouraged to do collaborative works with other research institutions/trading industries to be acquainted with world class current advanced practical biotechnological skills so that they become salable and could start their careers in the field of Biotechnology.

8.1 Enrollment of students:



Applicants tend for admission in CDBT-TU from the beginning to year 2078



Male Female Ratio of Students enrolled in MSc. Biotechnology (Batch 1-12)

M.Sc. Biotechnology program commenced in 2066 B.S. and 24 students are being enrolled each year. Though the ratio of male to female students enrolled till date from the establishment of the department is 55/45, the number of female students increased significantly in the recent 12th Batch with enrollment of 17 out of 24.

8.2 Graduations: Students enrolled in MSc. Biotechnology (Batch 1 - 9)

More than 90% of students enrolled in M.Sc. Biotechnology program pass each year with higher number of them achieving distinction. Though the program is of 2 years duration, students get engaged more in their research (thesis) work in their final year and most of them find it difficult to complete their degree within the academic year.

Student Graduation Profile

S.N./ Batch	Admission Year	M.Sc. Students appeared in final Exam	Distinction	First Division	Second Division	Thesis/Transcript Pending/Remarks	Left to complete
1	2065/66	22	7	14	0	0	3
2	2066/67	22	13	8	1	0	2
3	2067/68	21	9	12	0	0	3
4	2068/69	22	9	11	2	0	2
5	2070/71	20	5	6	3	1	5
6	2071/72	20	3	12	0	3	2
7	2072/73	21	3	4	0	12	2
8	2073/74	24	8	15		1	0
9	2074/75	23	0	4	0	19	1
10	2075/76	27				Ongoing	
11	2076/77	25				Ongoing	
12	2078/79	24				ongoing	

8.3 Ph.D. student's profile

Number of students enrolled in Ph.D.

S. N	Registered Year	Number of Ph.D. Students enrolled	Remarks
7.	2011	1	Completed
8.	2012	1	Completed
9.	2013	3	Two completed, 1 dropped
10.	2014	2	Completed
11.	2015	2	Ongoing
12.	2016	1	Ongoing
13.	2017	1	Ongoing
14.	2018	2	Ongoing
15.	2019	4	Ongoing
16.	2021	3	Ongoing
	Total	20	

9. Research Initiatives of the Department

9.1 Ph. D. Thesis completed

2015 Molecular characterization of Probiotics from dairy products of Nepal carried by Mr. Ranjan Koirala registered as collaborative research with Nepal Academy of Science and Technology (NAST) registered in 2011.

Supervisor: Prof. Rajani Malla

2017 Identification and Epidemiological Study of Zoonotic Parasites Prevalence in Nepal carried by Mr. Hari Bahadur Rana, Prof., Rampur Agricultural Campus, TU registered at Dr. K. N. Modi University, Newai, Rajasthan, India registered in 2012.

Supervisor: Prof. Krishna Das Manandhar

2017 Molecular Epidemiology and Genetic Characterization of Emerging Viral Diseases in Nepal carried by Mr. Birendra Prasad Gupta registered in 2013.

Supervisor: *Prof. Krishna Das Manandhar*

2019 Study on Immune Reconstitution Inflammatory Syndrome (IRIS) in HIV/AIDS Infection. Candidate- Mr. Shrawan Kumar Mishra registered in 2013.

Supervisor- Prof. Krishna Das Manandhar

2019 Characterization of Lignocellulose Produced by Thermophilic Bacteria Isolated from Hot Springs of Myagdi, Nepal. Candidate- Ms. Punam Yadav registered in 2014

Supervisors-*Prof. Tribikram Bhattarai &Dr. Jyoti Maharjan (NAST)*

2020 Production of Bioethanol by Electrochemical Redox Combination of Microbial Cells Using Lignocellulosic Biomass. Candidate- Ms. Jarina Joshi registered in 2014

Supervisors-Prof. Tribikram Bhattarai, Prof. Amar Yadav (CDC) & Prof. Shreerama Lakmhnia

9.2 Ph.D. Thesis Supervisions [Ongoing]

2015 Characterization of TNF-alpha gene polymorphism and its impact in Influenza A/Pandemic (H1N1) patients in Nepal. Candidate- Mr. Bimlesh Jha **Supervisor-Prof. Krishna Das Manandhar**

2015 Molecular and Genetic Characterization of Hepatitis Virus B of Nepal. Candidate- Ms. SmitaShrestha

2016 Molecular characterization of lytic bacteriophage specific to multidrug resistant bacteria and pharmacokinetics of phage in biological model. Candidate- Mr. Guna Raj Dhungana

2017 Stem cell proliferation and cytokines expression in response to medicinal plant extracts. Candidate - Mr. Bhuvan Saud

Supervisors-Prof. RajaniMalla& Dr. KantaShrestha (NAST)

2018 Designing of transdermal pad from natural polymer and oils for rheumatoid arthritis therapy. Candidate- Ms. Prasamsha Pant

Supervisors-Prof. Rajani Malla & Prof. RameshwarAdhikari (RECAST)

2018 Immuno-Molecular and Genetic Characterization of Dengue Virus in Nepal Candidate- Mr. RamanujRauniyar **Supervisor-Prof. Krishna Das Manandhar**

2019 Study on Process Optimization, Chemical, Biochemical and Microbial Analysis of Fermented Vegetables.Candidate- Mr. Rajesh Shrestha

Supervisor-*Prof. Ganga Kharel*

2019 Human Virome in Fever of Unknown Origin and Immune responses. Candidate- Dr. Eans Tara Tuladhar **Supervisor- *Prof. Krishna Das Manandhar***

2019 Antimicrobial Potential of Some Nepalese Medicinal plants against Multi Drug Resistance Escherichia coli Isolates. Candidate- Soma KantaBaral

Supervisor- Dr. Pramod Poudel

2019 Application of lytic bacteriophage against MDR bacterial isolates causing UTI and Molecular characterization holin and lysin gene responsible for lysis. Candidate- Dipendra Kumar Mandal

Supervisor- Prof. Rajani Malla

2021 A Molecular and Immunological investigation of Cutaneous and Visceral Leishmaniasis in Nepal. Candidate- Rajesh Kumar Gupta

Supervisors- Prof. Krishna Das Manandhar

2021 Investigation on the HLA-B* 13:01- based and metabolic patho-mechanisms of dapsone- induced drug hypersensitivity and development of loop-mediated isothermal amplification techniques for detection of HLA-B* 13:01 and Mycobacterium leprae in leprosy patients in Nepal. Candidate- Divya Raj Shamsher J.B. Rana

Supervisor- Dr. Jarina Joshi

2021 Etiology and immuno-molecular characterization of non-JE acute encephalitis syndrome. Candidate- Lilee Shrestha

Supervisor- Prof. Krishna Das Manandhar

9.3 National and International projects in the Department

9.3.1 Ongoing International/ National Projects in Central Department of Biotechnology

Year	Title	Funding body	Grants	Status
01/15/2022-01/14/2023	PI- Budha Basnet Co-PI-Prof. Krishna Das Manandhar Bioprospecting, extraction, screening, isolation and characteriza -tion of novelantibiotics from endolichenic fungi isolated from lichen of Butwal-Basantapur trekking trail area of Nepal	IFS (International Foundation for Science)	USD 14606.00	On going International
04/01/2020 - 03/31/2025	PI- Prof. Krishna Das Manandhar Emerging infections: surveillance, epidemiology and pathogenesis	National Institutes of Health (1U01AI151810-01)	NRs. ~ 3,00,00,000.00	International
07/10/2020 - 04/10/2022	PI-Lloyd (Nepal Chapter- Prof. Krishna Das Manandhar HCVax - International HCV vaccine consortium	Australian Academy of Science Regional Collaborations Programme (RCP_R2)	-	International – Network Development
2020 – 2022	Co-PI- Prof. Krishna Das Manandhar A Molecular and Immunological Investigation of leishmaniasis from an unusual foci of cutaneous and visceral disease in India and Nepal.	International Centre for Genetic Engineering and Biotechnology (ICGEB) – CRP – Italy Grant. [ICGEB Project	Publication support only	PI from Punjab University
2021 -2023	Prof. Tribikram Bhattarai, Prof. Dr. Achim Braeuning, University of Erlangen, Prof. Dr. Lars Opgenoorth Univversity Marburg, Germany Biogeographical aspects of climatic stress resilience of mountain forests of the central Himalaya.	Humboldt, Germany	Research support in kinds and travel	Ongoing
2019-2022 (2075 – 2078 B.S.)	Project. PI – Prof. Krishna Das Manandhar. *Profiling Cellular Immune Responses in Dengue Virus Infected Nepalese Population.* Dengue – UGC collaborative	UGC-Nepal Institutional Grant.	NRs. 2,000,000.00	Ongoing
2022-2023	Project Co-PI Dr. Jarina Joshi. *Biogas plant status in Nepal and enhancement in biogas production efficiency by incorporating bioelectrochemical system*	TU National Priority Research	NRs. 250,000.00	Ongoing

2077-78	PI – Ms. Alina Shri Sapkota. *Purification of compounds from Streptomyces*	Small Research Development and Innovation Grant-UGC	200,000.00	Ongoing

9.3.2 List of recently completed projects in Central Department of Biotechnology.

Year	Title	Funding body	Grants	Status
2018 - 2020 (2074 - 2076 B.S.)	Streptomyces – UGC collaborative Project. PI – Prof. Rajani Malla. *Biodiversity of Streptomyces from soil collected from various parts of Nepal and screening for potent bioactive compounds.*	UGC Institutional Grant	NRs. 2,000,000.00	completed
2076- 2078	PI- Ms. Jarina Joshi. *Design of Microbial fuel Cell to Manage Household Organic Wastes Using Mixed Culture of Microbes.*	Faculty Research Grant by UGC	NRs. 400,000.00	completed
2076-2077	PI – Ms. Pragati Pradhan. *Application of Bacteriophage to treat the multidrug resistant bacteria infection in mouse model*	Small Research Development and Innovation Grant by UGC	200,000.00	Completed
2016 - 2020	Dengue and dengue like diseases in the patients visited to defined hospitals of Nepal	Karius Inc Pt and La Jolla Institute for Immunology		

9.4 Paper published by faculties in the YEAR 2019-2021

1. Paudel, B., Maharjan, R., Rajbhandari, P., Aryal, N., Aziz, S., Bhattarai, K., Baral, B., **Malla, R**., & Bhattarai, H. D. (2021). Maculosin, a nontoxic antioxidant compound isolated from Streptomyces sp. KTM18 , *Pharmaceutical Biology*, 59:1, 933-936, DOI: 10.1080/13880209.2021.1946091
2. Aryal, M., Adhikari, R.B., Kandel, P., Ghimire, T.R., Khadka, D., Maharjan, J., Gaire, K.P., Shrestha, S., **Manandhar, K.D.**, Kandel, R.C., Poudel, R.C., Pandey, K. (2021). First report o the molecular detection of *Entamoeba bovis* from the endangered wild water buffalo(*Bulalus arnee*) in Nepal. *Vet Med Sci*; 1-9. DOI:10.1002/vms3.697
3. Yadav, P., Sharma, S., **Bhattarai**, **T**., Sreerama, L., Prasad, G. S., Sahni, G., & Maharjan, J. (2021). Whole-Genome Sequence Data Analysis of Anoxybacillus kamchatkensis NASTPD13 Isolated from Hot Spring of Myagdi, Nepal. *BioMed Research International*. 2021.1869748.11. https://doi.org/10.1155/2021/1869748
4. Bhandari, S., Sharma, J., Rizal, S., Yi, Y., & **Manandhar, G**. (2021). Artemisia vulgaris extract causes precocious acrosome reaction and viability loss but low rate of membrane damage in mouse spermatozoa. *Journal of Animal Science and Technology* 63, (1): 58.
5. Dhungana, G., Nepal,R., Regmi, M. & **Malla, R**.(2021). Pharmacokinetics and pharmacodynamics of a novel virulent Klebsiella phage Kp_Pokalde_002 in a mouse model. *Frontiers in Cellular and Infection Microbiology* 11. 684704. https://doi.org/10.3389/fcimb.2021.684704
6. Dhungana, G, Regmi, M. Paudel, P., Parajuli, A., Upadhyay, E., Gyawali, I., Upreti, H., Nepal, R., **Pradhan**, P. & **Malla, R**. (2021). Therapeutic Efficacy of Bacteriophage Therapy to Treat Carbapenem Resistant Klebsiella Pneumoniae in Mouse Model. *Journal of Nepal Health Research Council*. 19, (1), 76-82.
7. **Shrestha, S.**, Maurya, M. & **Manandhar, K.D**. (2021). An Investigation on the Detection of Human Leucocyte Antigen HLA Class I Loci (A, B, C) and Class II Loci (DR, DQ) Allele

Frequency in Nepalese Population by Next Generation Sequencing." *Journal of Applied Pharmaceutical Sciences and Research* 4(1), 1-6.

8. **Manandhar, K.D.**, McCauley, M., **Gupta B.P.**, Kurmi, R., Adhikari, A., Nguyen, A.V., Ngono, A.E., Zompi, S., Sessions, O. and Shresta S. (2021). Whole Genome Sequencing of Dengue Virus Serotype 2 from Two Clinical Isolatesand Serological Profile of Dengue in the 2015–2016 Nepal Outbreak. *American Jouranl of Tropical Medicine & Hygiene.* 104(1): 115–120. DOI: https://doi.org/10.4269/ajtmh.20-0163.

9. Bhandary, S., Shrestha S.L. Khatiwada R.P., Shah, D.N., Munankarmi N.N., Banjara, M.R., Thapa-Parajuli R., **Manandhar K.D.**, Adhikari, R., Tuladhar, R. Trend Analysis, Modelling And Impact Assessment Of Covid-19 In Nepal (2020) Journal of Institute of Science and Technology, 25(2), 1-8 ISSN: 2469-9062 (print), 2467-9240 (e) Doi: https://doi.org/10.3126/jist.v25i2.33715.

10. Prajapati S, Napit R, BastolaA ,Rauniyar R, Shrestha S, Lamsal M, Adhikari A, Bhandari P , Yadav SR , **Manandhar KD**. Molecular phylogeny and distribution of dengue virus serotypes circulating in Nepal in 2017(2020). PlosONE. | https://doi.org/10.1371/journal.pone.0234929 J

11. Jha BK, Lav R, **Manandhar KD**, Influenza virus preservation and its effect on infectivity and viral load by lyophilization technique(2020). BioMedical Jour of Sci & Tech Res. DOI 10.26717/BJSTR.2020.26.004330

12. Mishra, S. K., Shrestha, L., Pandit, R., Khadka, S., Shrestha, B., Dhital, S., ... & **Manandhar, K. D.** Establishment of Reference Range of CD4 T-Lymphocyte in Healthy Nepalese Adults. (2020). BMC Res Notes. 13:316 https://doi.org/10.1186/s13104-020-05156-5

13. Jha BK, Pandit R, Jha R, **Manandhar KD.** Overview of seasonal influenza and recommended vaccine during the 2016/2017 season in Nepal. *Heliyon*. 2020 Jan;6(1):e03304. doi:10.1016/j.heliyon.2020.e03304. eCollection.PMID:32021940; PubMed Central PMCID: PMC6994851.

14. Bastola A, Shrestha M, Lamsal M, Shrestha S, Prajapati S, Adhikari A, **Gupta BP**, Hide M, Devkota L, Chalise BS, Pandey K, **Manandhar KD**. A case of high altitude cutaneous leishmaniasis in a non-endemic region in Nepal (2020). *Parasitol. Int*. Feb;74:101991. doi:10.1016/j.parint.2019.10199 1. Epub 2019 Sep 11. PubMed PMID: 31520692.

15. Anup Bastola, Mitesh Shrestha, Mahesh Lamsal, Srijan Shrestha, Sabita Prajapati, Anurag Adhikari, **Birendra Prasad Gupta**, Mallorie Hide, Lina Devkota, Bimal Sharma Chalise, Kishor Pandey, **Krishna Das Manandhar**(2019). A case of high altitude cutaneous leishmaniasis in a non-endemic region in Nepal. *Parasitology International*.https://doi.org/10.1016/j.parint.2019.101991

16. Sunil Timilsena, SakkarinArdsiri, SuradaLerdwana, **Krishna Das Manandhar**, Kovit Pattanapanyasat, EgaritNoulsri (2019).Accuracy of lymphocyte counts from UniCelDxH 800 in β-thalassemia/HbE patients having various numbers of nucleated red blood cells. *Asian Pac J Allergy Immunol*. doi: 10.12932/AP-170119-0472

17. Mitesh Shrestha, Medha Khatri-Chhetri, Ram Chandra Poudel, Jyoti Maharjan, Shyam Prakash Dumre, **Krishna Das Manandhar**, Basu Dev Pandey, Sher Bahadur Pun and Kishor Pandey(2019). Molecular evidence supports the expansion of visceral leishmaniasis towards non-program districts of Nepal. BMC Infectious Diseases. https://doi.org/10.1186/s12879-019-4083-3

18. Gunaraj Dhungana, **Rajani Malla,** Manoj Rajaure, Sankar Adhya. Complete genome sequence of MyophageEc_Makalu_002 which infects uropathogenic *Escherichia coli.* Microbiology Resource Announcement. Vol 9, issue 5 e0530—19, mra.asm.org, 2020 (IF-2)

19. Bhuvan Saud, **Rajani Malla** and Kanti Shrestha. Stem Cell Therapy in Nepal: Challenges and Opportunities. Hosa Journal of Stem Cells Research, Development and Therapy. 2019. DOI: 10.24966/SRDT-2060/100022. (IJ)

20. Bhuvan Saud, **Rajani Malla** and Kanti Shrestha. A Review on the Effect of Plant Extract on Mesenchymal Stem Cell Proliferation and Differentiation. doi: 10.1155/2019/7513404, 2019. (IF-4)
21. **Jarina Joshi**, Pradip Dhungana, Bikram Prajapati, Rocky Maharjan, Pranita Poudyal, Mukesh Yadav, Milan Mainali, Amar Prasad Yadav, Tribikram Bhattarai and LakshmaiahSreerama. (2019). Enhancement of Ethanol Production in Electrochemical Cell by *Saccharomyces cerevisiae* (CDBT2) and *Wickerhamomycesanomalus* (CDBT7). *Front. Energy Res. - Bioenergy and Biofuels*. [doi.org/10.3389/fenrg.2019.00070].
22. Mukesh Yadav, Garima Bista, Rocky Maharjan, Pranita Poudyal, Milan Mainali, LakshmaiahSreerama, **Jarina Joshi** (2019). Secretory laccase from *Pestalotiopsis* species CDBT-F-G1 fungal strain isolated from high altitude: Optimization of its production and characterization. *Appl. Sci.* **9**: 340.
23. Pradip Dhungana, Bikram Prajapati, Sujeeta Maharjan and **Jarina Joshi** (2022). Current trends in lignicellulosic bioethanol production. *Int. J. Appl. Sci. Biotechnol*. 10(1): 1-11 (DOI: 10.3126/ijasbt.v10i1.41139

9.5 Research Support to students

9.5.1 Ongoing Ph.D. students' research grants of CDBT students

S.N.	Research Theme	Fund support	Ph.D. Scholar	Supervisor
1.	HBV infection in Nepal	UGC	Dr. Smita Shrestha	Prof. Krishna Das Manandhar
2.	Bacteriophage	UGC	Mr. Guna Raj Dhungana	Prof. Rajani Malla
3.	Dengue severity in Nepal	UGC	Mr. Ramanuj Rauniyar	Prof. Krishna Das Manandhar
4.	Transdermal polymer for Rheumatoid Arthritis	UGC	Ms. Prasamsha Pant	Prof. Rajani Malla Prof. Rameshwar Adhikari (RECAST)
5.	Fermented Vegetables	UGC	Mr. Rajesh Shrestha	Prof. Ganga Kharel
6.	Bacteriophage	UGC	Mr. Dipendra Mandal	Prof. Rajani Malla
7	Febrile of Unknown Origin Viral infection	NIH-U01	Dr. Eans Tara Tuladhar	Prof. Krishna Das Manandhar

9.5.2 M.Sc. thesis research grant awardees from UGC in 2020

1. Human Herpes virus , Epstein Barr virus and Kaposi's Sarcoma — Bandana Thakur
2. Riboswitch mediated antimicrobial inhibition — Bisheshta Nepal
3. Enhanced phage host range by phage cocktails — Indu Gyanwali
4. Bacteriophage for treatment of Salmonella in broiler chicken — Yujeen Chapagain
5. Characterization of Myxobacteria — Surendra Kumar Subedi

9.5.3 List of students received educational scholarships of the Department

9th Batch 2074/2075

S. N	Name of Student	I st Year First Sem	I st Year	2nd Year	Amount	Remark

			Sec. Sem	Third Sem		
1	Puja Bhatt	10000+10000	--------	--------	20000	Dr. Rekha&Sreerama Scholarship
2	Asbin Bahadur Chand	-------	10000	--------	10000	Dr.L.Sreerama Scholarship
3	Kabita Kandel	--------	10000	--------	10000	Dr. G.K. Rekha Scholarship
4	Samiran Subedi	35000	35000	35000	105000	Dept. Scholarship
5	Bisheshata Nepal	17500	17500	17500	17500	Dept. Scholarship
6	Siddhartha Gautam	17500	--------	--------	17500	Dept. Scholarship
7	Puja Bhatt	--------	17500	--------	17500	Dept. Scholarship
8	Pravesh Poudel	--------	--------	17500	--------	Dept. Scholarship
Total		**90000**	**100000**		**190000**	

10th Batch 2075/2076

S. N	Name of Student	I st Year First Sem	I st Year Sec. Sem	Amount	Remark
4	Binod Khadka	35000	--------	35000	Dept. Scholarship
5	Suruchi Karna	17500	---------	17500	Dept. Scholarship
6	Sujata Pokharel	17500	---------	17500	Dept. Scholarship
Total		**90000**	**100000**	**190000**	

H. Awards/Awardees to the Department

10. National Award to the Department

10.1 The Best Performer Institute in the field of Biotechnology

Being the institute of Biotechnology, it is contributing for the nation's welfare in the field of biotechnology. Ministry of Education, Science and Technology (MoEST) awarded CDBT-TU as "The Best Performer Institute in the field of Biotechnology" on the occasion of 9th National Science Day. Prof. Dr. Krishna Das Manandhar receiving the certificate from the Minister of MoEST, Nepal Government on Nov. 11, 2021 (2078/7/25). The program was organized by the MoEST at Nepal Academy of Science and Technology (NAST). The Ministry declared the rationale for the selection of CDBT-TU as the best performer on the basis of following criteria.

"विज्ञान तथा प्रविधिको उन्नत विकासः प्रकोप र महामारीबाट सहज निकास " अन्तर्गत जैविक प्रविधि केन्द्रीय विभागले गरेका योगदानहरु ।

१. कारोनाको पहिलो कहरले मिति २०७६।१२।१३ गते देखि लागु हुने गरी देश लक-डाउन अवस्थामा जाने सूचना प्राप्त पश्चात देशमा नै केही संस्थाहरुमा मात्र Real Time PCRसहित दक्ष जनशक्तिहरु रहेको अवस्थामा विभागमा संचालनमा रहेको Real Time PCR र अन्य आफ्ना उपकरणहरु प्रयोग गरी रोगको निदानका लागि प्रयोगशाला स्थापना गर्न पहल गरी मिति २०७७।३।२३ गते किर्तिपुर नगरपालिकासंगको सहकार्यमा प्रा.डा. कृष्णदास मानन्धर प्रयोगशालाको निर्देशक रहने गरी नेपाल सरकारको सरकारी मान्यता प्राप्त "किर्तिपुर न.पा. त्रि.वि. बायोटेक कोरोना प्रयोगशाला" स्थापना गरी यस जैविक प्रविधि केन्द्रीय विभागका विद्यार्थीहरुबाट मात्र संचालन हुने गरी पहिलो र दोस्रो कहरमा सरकारी दस्तुरमा नै कोभिड-१९ को निदान कार्यमा संलग्न रही हाल सम्म करिव २२००० परिक्षण गरी पूर्णरुपमा योगदान पुऱ्याएको र सो हालसम्म पनि संचालनमा रहेको छ ।

२. पहिलो कहर सुरु हुँदा देशमा Real Time PCR चलाउने दक्ष जनशक्ति नभएर अस्पताल तथा संस्थाहरुमा भएका केहि Real Time PCR उपकरण पनि प्रयोग नभई कोभिड-१९ को निदान नभई रहेको अवस्थामा यस विभागबाट उतिर्ण भएका विद्यार्थीहरु गई त्रि.वि. टिचिङ्ग अस्पताल-महाराजगंज (श्रीजन श्रेष्ठ), कोरिया मैत्री अस्पताल-ठिमी (सविता प्रजापति), डढेल्धुरा अस्पताल (वन्दना ठाकुर), CMDN-थापाथली (रोजी राउत) आदी स्थानहरुमा रहेका Real Time PCR उपकरण संचालनमा ल्याई प्रयोगशालाका प्रविधिकहरुलाई समेत प्रशिक्षण दिई राष्ट्रलाई अति आवश्यक रहेको जनशक्ति परिचालन गरि प्रकोप र महामारीबाट सहज निकासमा सहयोग पुऱ्याएकोछ ।

३. विश्वमा कोरोना सुरु हुने वित्तिकै यस रोगका भाईरस SARS CoV-2 तथा भविष्यमा पनि महामारी फैलाउन सक्ने सुक्ष्म जीवाणुहरुको बंशाणुगत अध्ययन अनुसन्धान गर्न अमेरिकाको Washington University का प्रा.डा. डेविड वाङ्गको सहकार्यमा बहुराष्ट्रिय (अमेरिका, चीन, हङ्गकङ्ग, ईथियोपिया र नेपाल) परियोजना "Emerging Infections: Surveillance, Epidemiology and Pathogenesis" विभागका प्रा.डा. कृष्णदास मानन्धरको प्रमुख सुपेरिवेक्षणमा टेकु अस्पताल र राष्ट्रिय जनस्वास्थ्य प्रयोगशाला पनि संलग्न हुने गरी संचालनमा आई गत वर्ष ई.सं. २०२० मे महिना देखि ५ वर्ष सम्म संचालन हुनेछ । हालमात्र यस परियोजनाले नेपालमा फैलिएको भारियन्टहरुको प्रारम्भिक अनुसन्धानबाट नेपालमा अल्फा, डेल्टा र डेल्टा प्लस गरी तीनै थरिका भारियन्टहरु अध्यावधिक रहेको पत्ता लागाएकोछ (प्रकाशित हुन बाँकी) ।

४. जैविक प्रविधिको विकाशका लागि आवश्यक उपकरणहरु ज्यादै महङ्गो हुने र विश्वविद्यालयको बजेट त्यस्ता उपकरणहरुका लागि नहुनुका कारणले उच्चकोटीको यो प्रविधि विकाश विश्वविद्यालय स्तरमा हुन गाऱ्हो हुने कारण विद्यार्थीहरु यो विषय अध्ययन गर्न बाहिर विदेश नै जान रुचाउने अवस्थालाई यस जैविक प्रविधि केन्द्रीय विभागले विभिन्न दातृ संघ संस्थाहरु प्रमुख त विश्व विद्यालय अनुदान आयोग सहितको सहयोगमा करिव ६/७ करोड बराबरका महत्वपूर्ण उपकरणहरु संगालेर आधारभुत स्तरबाट उठेर प्रकोप तथा महामारीसंग सम्बन्धित अनुसन्धान कार्यहरु गर्न सुसज्जित प्रयोगशाला स्थापना गरी अनुसन्धानको समेत थालनी भएकोछ ।

५. यस विभागले जैविक प्रविधिसंग सम्बन्धित राष्ट्रिय तथा अन्तराष्ट्रिय उच्चकोटीका अनुसन्धान मुलक बैज्ञानिक प्रकाशनहरुमा थुप्रै वटा लेखहरु प्रकाशित भैसकेकोछ ।

६. वार्षिक २४ जना स्नातकोत्तर तहमा विद्यार्थीहरु भर्ना हुने गर्छन् र करिव ७० जना उक्त तहका र हाल ११ जनाले विद्यावारिधि गरि रहेको यस विभागमा जीवनपयोगी जैविक प्रविधिसंग सम्बन्धित अनुसन्धानहरु भईरहेकाछन् । जस्तै, छालामा हुने कालाज्वर रोग, डेङ्गु रोगको को बंशाणुगत निदान, एन्टिबायोटिले मार्न नसक्ने ब्याक्टेरियालाई पनि मार्न सक्ने ब्याक्टेरियोफाजको खोजी, उपयोगी सुक्ष्म जीवाणु सहितको प्राङ्गारिक मल, सुक्ष्म जीवाणुको प्रयोगले फोहरबाट जैविक ईन्धन आदी ईत्यादी ।

७. त्रिभुवन विश्वविद्यालयको विज्ञान तथा प्रविधि अध्ययन संस्थान अन्तर्गतको सबै भन्दा कान्छो जैविक प्रविधि केन्द्रीय विभाग २०६४ साल मंसिर महिनाको निर्णय सहित स्थापना भई २०६६ साल बैशाख २३ गते देखि स्नातकोत्तर तहको कक्षा संचालन भएको र २०६७ साल देखि विद्याविरिधि र २०७४ बैशाख ९ देखि Postdoc तहको जैविक प्रविधि सम्बन्धि अनुसन्धान तथा अध्यापन भई विगत १३ वर्ष देखि यस क्षेत्रमा योगदान गरी रहेको छ ।

Ministry of Education, Science and Technology (MoEST) awarded CDBT-TU as “The Best Performer Institute in the field of Biotechnology”. Prof. Dr. Krishna Das Manandhar receiving the certificate from the State Minister, Mrs. Bodhmaya Kumari Yadav of MoEST, Nepal Government on Nov. 11, 2021 (2078/7/25).

10.2 The best performances of biotech students

The students are awarded through various scholarships throughout their study. Three students obtaining highest marks in each semester are encouraged through departmental scholarship. Fulbright scholar to the department, Prof. Dr. L. Sreerama established three scholarships for poor and intelligent students of the department and three different scholarships have been awarded to students every year. Students are also awarded through various scholarships from TU CAS (Chinese Academy of Sciences), UGC (University Grants Commission)- Nepal, NAST (Nepal Academy of Science and Technology), NHRC (Nepal Health Research Council) and other international organizations to carry out their research leading to M.Sc. dissertation.

Dr. Rekha and LakshemaiyaSrirama Gold Medal 2018" awarded to Pranita Poudeyal and Prof. Dayananda Bajracharya Research Award 2076 B.S. awarded to Mr. Mahesh Lamsal.

Best original article in Biotechnology: Award of Nepal Biotechnology Association to Sabita Prajapti In December 2021

I. Academic Events/Programs

The department is establishing new linkages with other national and international universities, research laboratories and industries. Frequent visit of guest lectures and their valuable presentations in new area of biotechnology is helping to enhance quality of teachers as well as students. Faculties and students are encouraged to write and submit as many proposals as possible for possible grants/funding. The curricula of all semesters have been revised by a long interactive seminars and collection of opinions from experts. This kind of activity will be continued in future as well.

11. Seminar/Workshops/Conferences in the YEAR 2019-2021 April

Department is conducting winter school and summer school to train different interested individuals in molecular biology, cell culture and other field of biotechnology. In this program, department has collected some funds from the participants and funding agency to strengthen the research activity in the department.

11.1 National conference/Workshops

1. CDBT-TU 2nd Winter School-2020 A Workshop on "Experimental Biotechnology: A Teachers' Training" on January 27-31, 2020, Department has already conducted

   After the 1st winter school on Applied Molecular Biology (Hand on training) organized on January 7-10, 2018, there were inquiries to the Department for such kind of workshop. Department understand the lack of the practical knowledge in the university faculties who deal with theoretical classes in their respective institution. Most of them do not have PCR like instrumentation facility in their home institute and those who have also are not skilled to run. There were participation from different parts of the country and the Department is proud enough that it is supporting the capacity building of the faculties and helping to strengthen the university teaching-learning. The chairperson of University Grant Commission Prof. Dr. Bhim Subedi was the chief-guest in the closing ceremony who expressed great satisfaction on the achievements of the workshop after listening the feed-backs from the participants.

2. 1st National Eloquence Contest and Seminar on "Scope of Biotechnology in Nepal and its role in Nation Development" on September 16, 2019

   Nepalese Biotechnology Society (NBS), an organization of the bonafide students of CDBT-TU put hands together with the Department and organized the First National Eloquence Contest and Seminar on "Scope of Biotechnology in Nepal and its Role in nation development". Students from different biotechnology institutes participated and the top scored were awarded. It had a session of an Academia-Industry Network Development interactive program in which industries from poultry, pharmacy, organic fertilizer manufacturers and the research institutes including the National Innovation Center actively participated.

3. NGS Training (March 15-17, 2021)- The overwhelming instrument, Illuminia MiSeq Next Generation Sequencer, not only in the Department but also in the country was purchased and reached in the Department during the Covid-19 pandemic. It was a great pleasure for the institute and university that Department could detect the variant of SARS Cov-2 and uploaded to GSAID. Since the instrument was advanced, Department could manage an expert from Illumina-India whoc visited Nepal and trained the core team of the Department which included, the faculty, lab technician, PhD students and M.Sc. thesis students. There was backup support of the alimni; Mr. Rajindra Napit and Roji Raut for the work. The training was conducted in the Infectious and Viral Disease Research laboratory's NGS lab of the Department on March 15-17, 2021.

The organizing team of CDBT-TU with authorities, participants and the experts. Clockwise from top left. 2nd International Workshop on Flow Cytometry (March 2 – 6, 2019), Dignitaries on the opening ceremony of Eloquence (Sept. 16, 2019), 2nd Winter School for intra /inter university faculties (Jan. 27-31, 2020), First Illumina MiSeq NGS operation training (March 15-17, 2021).

11.2 International conference/Workshops

1. "International Workshop on Advancing Biological and Clinical Research with Flow cytometry-2019" on March 2-6, 2019.

Department has conducted the First International Flow Cytometry workshop in 2017 and is thankful to the International Flow Cytometry team who have been regularly supporting the functional aspects of the BD FACSCalbur instrument and organize the workshops. Dr. Willium Telford (the key person to donate the instrument) and Prof. Paul K Wallace who have provided reagents for the instruments are the members of this second workshop. The VC of Tribhuvan University, Prof. Dr. Tirtha Raj Khania inaugurated the workshop. This workshop was targeted to the researchers of the university as well as the clinical persons. Thirty-two participants from hospitals, pathology lab and universities were encouraging and has helped CDBT-TU to be recognized as a academic institution supporting the medical research.

2. Central Department of Biotechnology, TU International Virtual workshop on "Basic Course on Flow cytometry - 2021"on Feb 16-18, 2021 (Falgun 4-6, 2077)

3. Central Department of Biotechnology, TU International Virtual workshop on "Capacity Building on Flow cytometry - 2021"on May 4 - 7, 2021 (Baisakh 21-24, 2078)

Due to the Covid-19 pandemic continuation, Department could not organize any workshops in physical presence so with support of the International Flow Cytometry Team, Department has organized on-line workshop from Feb. 16-18, 2021. Huge numbers of the participation 150+ were there to attend the three/four-days workshop.

11.3 Talk programs organized in CDBT-TU

List of Talk Programs in 2019 & 2020

S.N.	Name	Institute	Year	Remarks
1	Dr. Anaya Raj Pokhrel	University of Minnesota, USA	2022	Talk on "EutM shell protein as building blocks for multifunctional biomaterials"
2	Christian Jonta'zar	University of Castilla–La Mancha (UCLM), Spain	2022	Department visit for future collaboration
3	Jose' de la Fuente	University of Castilla–La Mancha (UCLM), Spain	2022	Department visit for future collaboration
4	Dr. Sangeet Lamichhaney	Kent State University, USA	2019	Evolution
5	Prof. Dr. Remco Kort	VU (Vrije Universiteit Amsterdam), Netherland	2020	Fermentation
6	Dr. Hariom Singh	ICMR-NARI, India	2019	HIV virus
7	Max Paoli	TWAS Programme Co-ordinator	2019	
8	Prof. K.R.S. Sambasiva Rao	Mizoram, University, India	2020	Research with simple devices and patents
9	Motonari Uesugi	Kyoto University	2020	Support for ACBI
10	Prof. Dr. Shamsher Singh Kanwar	Himachal Pradesh University, Shimla-171 005 [INDIA]	2019	Talk on "Basic sciences - A step towards translational research"
11	R. Raghu	Schrodinger Inc, USA`	2019	Talk on "Success Stories on Computational Drug design in selective inhibitor design for potential cancer targets using Docking, Thermodynamics and Free Energy Calculation Methods"
12	Dr. Prabhat S. Kunwar	Biogen, USA	2019	Talk on 'Neural circuit control of fear and anxiety"
13	Dr. Pawan Parajuli	Australian National University, Australia	2020	Talk on "Study of bacteriophage encoded glucosyltransferase (gtr) genes in Shigella flexneri serotype 1c"
14	L.P. Bhanu	Jeevan Bigyan Kendra	2019	Motivational talk program for youth in the context of Science and Spirituality
15	Dr. Raunak Shrestha	University of British Columbia Canada.	2019	Talk on "Precision Oncology"
16	Rajendra Sinkhada(Maitraye Aman)		2019	Talk on Epigenetics, mindfulness and ancient civilization
17	Ven. Bhante Kaundanya	Buddha Bihar, Putalisadak	2020	Talk on Buddha ra Shanti Sikshya
18	Ven. Guruma Kushumi	Dharma Kirti Bihar, Basundhara	2021	Talk on Buddha Jayanti ra Lokottar Sikshya

11.4 Memorandum of Understanding with different institutes

List of MOU with different National and International Institutes

S.N	Institution/ Organization	Start Date	End Date
1.	Alpha Agro. Pvt. Ltd.	January 12, 2020 (Magh 6, 2076)	
2.	Medi Quest Laboratory Clinic P. Ltd.	June 1st , 2019 (Jestha 18, 2076)	June 1st, 2022
3.	Natural History Museum, Tribhuvan University, Swayambhu, Kathmandu	13th August, 2019	13th August, 2023 (4 years)

4.	State Key Laboratory of Genetic Resources and Evolution, Kunming Institute of Zoology, Chinese Academy of Sciences, Kunming, China	18 December, 2018	2022 (5 years)
5.	Sukraraj Tropical and Infectious Disease Hospital, Teku	April 17, 2019	3 years
6.	National Institute of Health Science, USA	Since 2017	continue
7.	La Jolla Institute of Immunology, USA	Since 2015	continue
8.	Washington University, USA	Since 2020	continue

Students are getting opportunities to conduct their final year thesis in those recognized institutes.

J. Scopes and involvement of the graduates from CDBT-TU

12. CDBT - Alumni

The pass-out students have formed Central Department of Biotechnology alumni (CDBT-Alumni) comprising seven member executive team as below.

1. Mahes Lamshal President
2. Apsara Parajuli Vice President
3. Roji Raut Secretary
4. Srijan Shrestha Treasurer
5. Pranita Sharma International Outreach
6. Mahadev Bista International Outreach

13. Students engaged in different fields (national/international).

Fields	Numbers of students
Ph. D. USA	22
Ph.D. other countries/ Nepal	16
Civil services/ Government institute	9
Research Lab	28
Teaching	10
Thesis remaining till 7th Batch	31
Miscellaneous	33
Total	149

14. Entrepreneurship initiated by Biotechnology graduates

Several students have owned their one Biotechnology Business Houses and benefitting themselves and providing job opportunities for others.

1. Arya Diagnostics (Bagbazar, Kathmandu): Molecular Disease Diagnosis -*Mr.Raju Lama*
2. Dirghayu Biotech (Godawari, Lalitpur): Molecular tools in new innovations *MiteshShrestha, RajendraNapit, Roshan Nepal, SujindraSubedi*
3. Praramva Biotech (Sitapaila, Kathmandu): Biofertilizer and Biopesticide Production-*BaidyanathJha*
4. Ficus Biotech (Dhulikhel, Kavre): Tissue culture propagation and distribution of Paulownia, Bamboo plants –*SantoshDahal*
5. RaraBiotech:Diagnostic kit development.-*SumeenaKarki, BimalaDhakal, GauriThapa*

K. Visitors to and from the Departments

15. Distinguished persons visited to CDBT-TU

World Bank representatives visiting CDBT-TU laboratory (Jan. 29, 2019), KOICA team visit to Dept. March 6, 2019. Mizoram VC Prof. KRS Sambhasiva Rao (June 9, 2020) & WHO representative visit to Department's NGS laboratory (Jan 27, 2022).[Clockwise from top left.]

L. Financial Report

Resource Generations by the Department

FY 075-076

S.N	Name	Program	Sources	Amount
1	Collaborative Research Grant-Prof. Krishna Das Manandhar	Collaborative Research Grant	UGC	400000
2	FLOW CYTOMETRY Workshop 2019	International Workshop	Participants and other financial supporter	411000.00
3	Research Grant Support Ramanuj	Research Grant	UGC	500000.00
4	CDBT Winter School-2018	Winter School-2018	Participants	175000.00
5	Collaborative Research Grant- Prof.Dr. Rajani	Collaborative Research Grant	UGC	720000.00

	Malla			
6	Flow cytometry workshop 2018	International Workshop	Participants and other financial supporter	150000.00
7	ICIMOD Project	Project	ICIMOD	260812.38
Total				**2616812.38**

FY 076-077

S.N	Name	Program	Sources	Amount
1	HERP Project	HERP Project	UGC	200000
2	QAA cycle Completion DLI-1	DLI-1	UGC	3840000
3	FLOW CYTOMETRY Workshop 2019	FLOW CYTOMETRY Workshop 2019	Participants and other financial supporter	60000
4	FLOW CYTOMETRY Workshop 2019	FLOW CYTOMETRY Workshop 2019	Participants and other financial supporter	175000
5	Research Grant Support - Prasamsha	Research Grant Support	UGC	500000
6	UGC Faculty Research Grant- Jarina	UGC Faculty Research Grant	UGC	80000
7	UGC Small RDI Grant- Pragati Pradhan	UGC Small RDI Grant	UGC	45000
8	UGC Small RDI Grant- Suresh Subedi	UGC Small RDI Grant	UGC	45000
9	UGC Faculty Research Grant- Jarina	UGC Faculty Research Grant	UGC	160000
10	1st National Eloquence Contest and Seminar	2nd National Eloquence & Seminar	Participants and other financial supporter	50000
11	Winter School 2020	Winter School 2021	Participants and other financial supporter	115000
Total				**5270000.00**

FY 077-078

S.N	Name	Program	Sources	Amount
1	HERP-DLI: 2	HERP-DLI: 2	UGC	715666.00
2	HERP-DLI: 1	HERP-DLI: 1	UGC	3000000.00
3	HERP-DLI: 2	HERP-DLI: 2	UGC	3530873.00
4	HERP-DLI: 2	HERP-DLI: 2	UGC	9641875.00
5	HERP-DLI: 8	HERP-DLI: 8	UGC	800000.00
6	HERP-DLI: 2	HERP-DLI: 2	UGC	880304.00
7	UGC for Winter School	UGC for Winter School	UGC	200000.00
8	NIH U021 USA Project Prof. Krishna Das Manandhar	International Project	PTE- The Washington University	3276574.50
Total				**22045292.50**

FY 078-079

2078 चैत मसान्त सम्म

S.N	Name	Program	Sources	Amount
1	Higher Education Reform Project, HERP-DLI: 1	HERP-DLI: 1	UGC	2000000.00
2	Laboratory grants -UGC	Laboratory grants -UGC	UGC	4200000.00
3	Higher Education Reform Project, HERP-DLI: 2	HERP-DLI: 2	UGC	1283369.64
4	Second Summer School	Second Summer School	Participants and other financial supporter	115000.00
5	Dipendra Kumar Mandal, PHD UGC Grant	Dipendra Kumar Mandal, PHD UGC Grant	UGC	500000.00
6	NIH U021 USA Project Prof. Krishna Das Manandhar	International Project	PTE- The Washington University	2931625.00
7	NIH U021 USA Project Prof. Krishna Das Manandhar	International Project	PTE- The Washington University	3292159.65
Total				**14322154.29**

Expenditure Analysis of the Last Four Years

Budget Code	Budget Head	FY 2075-076	FY 2076-077	FY 2077-078	FY 2078-079
		Expenditure	**Expenditure**	**Expenditure**	**Expenditure upto 2078 chaitra**
	Capital Expenditure	9269310.25	738852.00	29822559.00	2875962.00
	Operating Expenditure/Recurrent Expenses				
	Salary, Allowance, PF and Gratuity	13,888,938.70	14,407,590.30	14,298,465.60	11,378,236.00
	Other operating expenditure	4,654,359.00	2,855,050.00	2,960,385.00	1,589,966.00
Total		**18543297.70**	**17262640.30**	**17258850.60**	**12968202.00**
Grand Total		**27,812,607.95**	**18,001,492.30**	**47,081,409.60**	**15,844,164.00**

त्रिभुवन विश्वविद्यालयबाट विभागमा प्राप्त आम्दानी

FY 075-076

S.N	Particular	Amount
1	तेश्रो चौमासिक निकाशा बापत रकम दाखिला गरिएको ।	4259500.00
2	छुट क.सं. कोष र अवकाश कोष रकम प्राप्त भएको ।	35840.00

3	त्रि.वि. केन्द्रीय कार्यालय प्रथम चौमासिक बजेट निकासा	4483000.00
4	प्रा.तिलकराम श्रेष्ठको थप संचित विदा चौमासिक निकासा	459971.00
5	बैंक दाखिला गरि आम्दानी जनाएको	977496.00
6	विकास बजेट भवन निर्माणको रकम निकाशा	10000000.00
7	दोश्रो चौमासिक बजेट निकासा	4233000.00
8	प्रथम र दोश्रो चौमासिक विकास बजेट	266000.00
9	तेश्रो चौमासिक बजेट निकासा	2874200.00
10	बृद्धि भत्ता	279000.00
11	लेखा अ. सुमित्रा मानन्धरको तलव भत्ता	126100.00
	Total	27994107.00

FY 076-077

S.N	Particular	Amount
1	प्रथम चौमासिक बजेट निकासा बैंक दाखिला	4,158,000.00
2	दोश्रो चौमासिक निकाशा	3,908,000.00
3	विकास बजेट भवन निमार्ण प्रथम र दोश्रो विकास बजेट	9,000,000.00
4	तेश्रो चौमासिक बजेट निकासा बैंक दाखिला	5,716,400.00
5	विरेन्द्र प्रसाद गुप्ताको थप बजेट निकासा बैंक दाखिला	198,000.00
	Total	22,980,400.00

FY 077-078

S.N	Particular	Amount
1	प्रथम चौमासिक बजेट निकासा बैंक दाखिला	4,849,000.00
2	दोश्रो चौमासिक बजेट निकासा	4,599,000.00
3	तेश्रो चौमासिक बजेट निकासा	4,599,000.00
	Total	14,047,000.00

FY 078-079

	2078 चैत मसान्त सम्म	
S.N	Particular	Amount
1	प्रथम चौमासिक बजेट निकासा बैंक दाखिला	4,808,000.00
2	दोश्रो चौमासिक बजेट निकासा	4,458,000.00
	Total	9,266,000.00

महालेखापरीक्षकको कार्यालय
Office of the Auditor General
बबरमहल, काठमाण्डौं, नेपाल
Babar Mahal, Kathmandu, Nepal

शिक्षा, विज्ञान प्रविधि तथा विश्वविद्यालय ले.प. निर्देशनालय

पत्र संख्याः २०७७/७८
च.नं. ४९६

मितिः २०७८/३/२०

विषयः- लेखापरीक्षणको प्रारम्भिक प्रतिवेदन ।

कर्ते नं. - ३/०८८/०८९
मिति - २०८८।४।१९

श्री विभागीय प्रमुखज्यू
त्रि.वि. जैविक प्रविधि केन्द्रीय विभाग,
कीर्तिपुर।

लेखापरीक्षण ऐन, २०७५ अनुसार त्यस कार्यालयको आर्थिक वर्ष २०७६/७७ को विनियोजन/राजस्व/धरौटी/अन्य कारोबारको आर्थिक विवरण, आन्तरिक लेखापरीक्षण प्रतिवेदन, शीर्षकगत तथा कारोबारगत भुक्तानीको विश्लेक्षण समेतका आधारमा तयार गरिएको पाना ४ (चार) को प्रारम्भिक प्रतिवेदन यसैसाथ छ ।

कार्यालयबाट पेस भएको आर्थिक विवरणप्रतिको उत्तरदायित्व प्रचलित कानुन बमोजिम जिम्मेवार व्यक्तिको हो। लेखापरीक्षकको उत्तरदायित्व नेपाल सरकारी लेखापरीक्षणमान बमोजिम आर्थिक विवरण परीक्षण गरी प्रतिवेदन गर्नु हो। प्रतिवेदनमा उल्लिखित व्यहोराका सम्बन्धमा आर्थिक कार्यविधि तथा वित्तीय उत्तरदायित्व ऐन, २०७६ को दफा ३७(१) बमोजिम ३५ दिनभित्र फछ्र्यौंट गरी सम्परीक्षण गराउनु हुनेछ। उक्त समयभित्र फछ्र्यौंट गरी सम्परीक्षण नगराएमा ऐनको दफा ३७(४) बमोजिम कारबाहीका लागि लेखाउत्तरदायी अधिकृतलाई जानकारी गराइने व्यहोरा निर्देशानुसार अनुरोध गर्दछु ।

(श्रीराम तिमिल्सिना)
निर्देशक

बोधार्थ तथा कार्यार्थः
श्री त्रिभुवन विश्वविद्यालय,
लेखापरीक्षण महाशाखा, काठमाण्डौ – प्रतिवेदन संलग्न छ ।

M. Recalling the memories from the year 2019-2021

TALKS/VISITORS

Dr. Sangeet Lamichhane (March 01, 2020)

Baplu Rai Erlangen, Germany(29 Dec 2019).

Prof. P.N. Mishra, Eminent Prof., Zoology, TU (29 Nov 2019)

Prof. Brook, New Mexico University, USA(April 22, 2019).

Dr. HariOm Singh,ICMR-NARI, Pune, 14 Dec 2019

Asian Chemical Biology Team (Feb 10, 2020)

Chaudhary (17 Feb 2020).

Padova Uni, Italy with Prof. Profs. Christian & Jose from UCML Spain (Feb 10, 2022)