

**FORMAT FOR SUBMISSION OF PROGRESS REPORT
INSTITUTIONAL LEVEL BIOTECH HUBS
Consolidated Progress Report since inception of biotech hub-**

- Name & address of the institution: **Pachhunga University College, Aizawl, Mizoram**
- Name & designation of the Coordinator: **Dr. Vanramliana, Assistant Professor**
- Name & designation of the Co-Coordinator: **Dr. H. Lalthanzara, Assistant Professor**
- Telephone, Mobile, Fax and Email of the Coordinator & Co-Coordinator: 9436155916, vana.puc@gmail.com; 9436195549, hvara.puc@gmail.com
- Level of the Biotech Hub: **Advanced Institutional Level Biotech Hub**
- Date & Year of the sanction of biotech hub with DBT's Sanction No.: **BCIL/NER-BPMC/2011-1472, Dated 16th December 2011**
- A brief write up about your organization/institution along with the role played by the Institutional Level Biotech Hub for its development (not exceeding 20 lines):
- Total funding received and Utilized so far:

(Rs. In lakhs)

Year	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	Total
Total Amount Received	19	9.18	3.28	5.16	5.80	28.93	25.70		97.05
Amount Utilized	17.98728	7.73389	5.4642	5.158	5.448	25.753	23.9663		91.51067

Please mention total budget received from DBT under Non-Recurring Head = Rs. 40 lakhs

- Details of Infrastructure created:

(a) List of equipment procured: (Equipments procured under the biotech hub since its inception)

Sl. No.	Name of the equipment	Model No. & Brand Name	Cost in Indian Rupees	Date of Purchase	No. of researchers/ students utilized these Equipments
1	Gradient PCR	Eppendorf	460000	15/4/2012	18
2	Cooling Centrifuge	Eppendorf	470000	15/4/2012	60
3	Online UPS (6kva)	Epoch	23500	13/7/2012	60
4	Gel electrophoresis with power pack	Genei	29950	15/4/2012	60
5	UV Transilluminator	Genei	26400	15/4/2012	60
6	Microwave oven	Samsung	5290	12/7/2012	60
7	Deep Freezer	Haier	18500	14/3/2012	60
8	Micropipette	Eppendorf	73780	15/4/2012	60
9	Autoclave	NSW	65000	15/4/2012	80
10	PCR Mini Cooler	Tarsons	21209	15/4/2012	18
11	Cryo tube rack	Tarsons	20000	15/4/2012	18
12	Micropipette Stand	Tarsons	5000	15/4/2012	60
13	UPS Battery	Amaron	44144	18/7/2012	60
14	Micropipette	Genetix	10650	10/12/2013	60
15	Mini spin	Tarsons	5000	10/12/2013	60
16	Ups 20 kva 3p-1p; batt 120ah 12v	Uniline	430500	31/8/2014	125
17	Laptop	Asus	33000	8/9/2014	5
18	Digital camera	Canon	45000	24/11/2014	18
19	Air Conditioner	LG	40000	26/11/2014	60

20	UPS	Sukam	61025	26/11/2014	60
21	Dissecting microscope	Olympus	57790	16/12/2014	70
22	Gel electrophoresis kit	Genei	35000	16/12/2014	60
23	Refrigerator Large	Panasonic	39500	21-01-2018	60
24	Refrigerator Small x2	Panasonic	32800	22-01-2018	60
25	Biosafety Cabinet- BSL2	BioBASE BRH-59- 07	262500	03-03-2018	18
26	Light trap	Generic	5141	03-03-2018	10
27	Projector	Epson	37500	03-03-2018	112
28	Horizontal Electrophoresis	BRCP-31DN	71400	07-03-2018	60
29	Weighing Balance	BAS 203	31500	07-03-2018	60
30	B.O.D. Incubator	Bio era	106694	07-03-2018	50
31	Micro Pipette Set	Bio Era	80725	17-03-2018	60
32	Vortex Mixer	HS120214	21000	17-03-2018	60
33	Orbital Shaking Incubator	BR1-111	107100	17-03-2018	50
34	AC	Panasonic	40000	17-03-2018	18
35	Microscope Camera	1 SJ cam	11490	17-03-2018	18
36	Water bath(shaking)	Bio era	80000	17-03-2018	60
37	Tissue culture rack	Generic	30000	17-03-2018	18
38	Deep freezer	Haier	24500	17-03-2018	60
39	UPS battery	Sukam	18150	17-03-2018	60
40	Real Time PCR	BioRad	966000	28-01-2019	18
	TOTAL		3900738		

10. Detail of hands on training programmes/workshops organized since the inception of the biotech hub:

(a) Hands on trainings/workshops conducted:

Sl. No	Title	Duration and Dates	No. of Participants	Level of Participants
1	Hands on Training on DNA Barcoding	3 days (14-16 th March 2013)	22	Faculty and Research Scholars
2	A special Workshop for College Teachers "Techniques in Biotechnology & Bioinformatics" at Pachhunga University College	3 days – 21 st – 23 rd August 2013	36	College Faculty
3	Departmental Hands-on Training on Molecular Techniques at Dept of Zoology, Pachhunga University College	2 days – 22 nd -23 rd March 2014	16	Faculty and Scholars
4	DNA isolation and PCR amplification for Faculties of Zoology Department, PUC	15 days; 4th Aug- 22nd Aug 2014	2	Faculty
5	DNA isolation and PCR amplification for Faculties of Botany Department, PUC	15 days; 25 th Aug-12th Sep, 2014	2	Faculty
6	DNA isolation and PCR amplification for Faculties of Environmental Science Department, PUC and Research scholars of Environmental Science Department, Mizoram University	10 days; 15 th Sep-26th Sep, 2014	5	Faculty and Research Scholars
7	DNA Isolation and PCR amplification of COI from insects, amphibians and annelids for 6 th Semester students, Department of Zoology, Pachhunga University College.	6 days; 17 th -22 nd Oct 2014	11	B.Sc Students
8	Hands of training on Techniques in Modern Biology for BLISS Coordinators	7-9 th January 2015	2	Secondary School faculty
9	DNA Extraction and Amplification, (M Pharm Students)	3 days; 19 th &20 th March 2015	4	M.Pharm
10	Hands on training on Molecular techniques for research scholars of Life Sciences in Pachhunga University College	15 days; 13 th -28 th Aug 2015	4	PG, Research Scholars

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11	DNA extraction from bacteria and Hands on training on Agarose Gel Electrophoresis, (M Pharm students from RIPANS)	2 days; 15 th – 16 th Aug 2015	9	M Pharm
12	DNA extraction and PCR Amplification for UG Students	5 days; 7 th – 11 th December 2015	19	B. Sc
13	Hands on training on Agarose Gel Electrophoresis at Govt. Champhai College, Champhai, Mizoram	5 th Feb 2016	21	B Sc
14	Hands on training on techniques in molecular biology for Govt. G.M. HSS Champhai Teachers	3 days; 23 rd – 25 th May 2016	2	HSS
15	Hands on training on DNA Isolation for students of Zoology and Botany, Pachhunga University College	3 days; 18 th – 20 th January 2017	42	B.Sc
16	Training on mushroom spawn production <i>p. sajor caju</i> and <i>p florida</i>	1 month, January 2017	4	M. Sc
17	Training on mushroom cropping for women of local areas (in collaboration with Diploma in Mushroom Cultivation, Pachhunga University College)	2 days; 8 th and 9 th February 2017	10	Local Women
18	Gel electrophoresis for MPharm students of RIPANS, Aizawl.	1 day, 9 th June 2017	5	M Pharm
19	DNA Isolation and PCR amplification from bacteria for students project from RIPANS, Aizawl	3 weeks, 8 th May – 26 th May 2017	1	M Pharm
20	Hands on training on techniques in molecular biology for faculty of Horticulture, Mizoram University.	1 week, 19 th – 26 th July, 2017	1	Faculty
21	Hands on training on DNA Isolation and PCR Amplification from bacteria for M.Pharm student, RIPANS	5 days; 21 st -25 th August, 2017	1	PG
22	Hands on training on DNA Isolation and Bacterial Culture at BLISS, Govt. Zemabawk Higher Secondary School.	3 months, August – October 2017	57	HSS
23	Hands on training on DNA Isolation and Bacterial Culture at BLISS, St. Pauls Higher Secondary School.	1 month, November 2017	62	HSS
24	Hands on training: PCR and DNA Sequence editing for RIPANS faculty	19-23 Feb 2018	5	Faculty
25	Hands on training on DNA Isolation and PCR Amplification from animal tissue for Dept. of Zoology, PUC	5 days, 5 th to 9 th February 2018	34	UG
26	Hands on training on DNA Isolation and PCR Amplification from plant tissue for Dept. of Botany, PUC	5 days, 12 th to 16 th February 2018	37	UG
27	Hands on training on DNA Isolation and PCR Amplification from moth for research scholar, Dept. of Zoology, MZU	5 days, 5 th to 9 th March 2018	1	JRF
28	Hands on training on Mushroom Cultivation for Dept. of Botany, Mizoram University at Pachhunga University College	1 day, 1 st June 2018	5	PG
29	Skill Development Training on Mushroom Cultivation for Vanlalawmpuii, BSc Agri, Glocal University, U.P.	14 days, 21 st June – 5 th July 2018	1	UG
30	Skill Development Training/Internship on Mushroom Cultivation for Vanrohlupuii and C. Lalramngaihawma, BSc Agri, Glocal University, U.P.	1 month, 25 th July – 24 th August 2018	2	UG
31	DNA extraction and amplification from <i>Solanum</i> for Joseph Lalrinkima, Dept. of HAMP, MZU	1 week, 15 th – 19 th October 2018	1	PG

32	Technical training on microbial culture, genomic DNA extraction, PCR amplification and gel electrophoresis.	2 weeks, 8 th Oct – 19 th Oct 2018	4	UG Faculty
33	Hands on training on Bacterial Culture at BLISS Zemabawk Higher Secondary School	4 days, 13 th -16 th November 2018	44	HSS
34	Hands on training on Molecular techniques for B.Sc., Dept. of Zoology and Botany, PUC	3 days, 20 th -22 nd December 2018	16	UG

(b) Seminars/symposium/awareness/outreach programmes conducted since the inception of the biotech hub:

Sl No.	Topic	Duration and Dates	No. of participants	Level of participants
1	Biotech Hub Extension Programme @Govt. Zemabawk HSS, Aizawl, Mizoram	1 day – 6 th December 2013	34	HSS
2	Biotech Hub Extension Programme @Govt. Serchhip College, Serchhip, Mizoram	1 day - 28 th March 2014	60	BSc
3	Biotechnology extension programme- Biology for students at LTM High School, Ngopa; Mizoram	1 day; 13 th Jan 2015	39	High School
4	Advances in Biotechnology and Demonstration of equipments at Zemabawk Higher Secondary School, Aizawl; Mizoram	1 day; 13 th Jan 2015	43	HSS
5	Advances in Biotechnology and Demonstration of equipments at St. Joseph Higher Secondary School, Aizawl; Mizoram	1 day; 14 th Jan 2015	38	HSS
6	Biotechnology extension programme- Advances in Biotechnology at Kolasib College, Mizoram	2 days; 27 th & 28 th Mar 2015	25	BSc
7	Advances in Biotechnology, scopes and applications at Mount Carmel School, Aizawl, Mizoram	1 day; 12 th Sept 2015	72	HSS
8	Advances in Biotechnology, scopes and applications at Baptist Higher Secondary School, Serkawn, Lunglei Dist., Mizoram	1 day; 22 nd Jan 2016	68	HSS
9	Advances in Modern Biology at Govt. High School NE Khawdungsei; Champhai Dist., Mizoram	1 day, 15 th Jan 2016	60	HSS
10	State level seminar on Modern techniques in Biology at Govt. Champhai College, Champhai, Mizoram	1 day; 5 th Feb 2016	60	BSc
11	Advances in Modern Biology at Govt. GM Higher Secondary School, Champhai, Mizoram	1 day; 6 th Feb 2016	37	HSS
12	Demonstration of equipments and techniques in Molecular Biology at St. Paul's Higher Secondary School, Aizawl, Mizoram	2 days; 10 th – 11 th Mar 2016	123	HSS
13	Demonstration of equipments and techniques in Molecular and Microbiology at Govt. Zemabawk Higher Secondary School, Aizawl, Mizoram	1 day; 13 th March 2016	70	HSS
14	Awareness and demonstration of equipments and techniques in Molecular Biology at St. Joseph HSS, Aizawl, Mizoram	1 day; 15 th June 2016	50	HSS
15	Demonstration of equipments in Modern Biology at Emmanuel English Higher Secondary School, Aizawl, Mizoram	1 day; 10 th Feb 2017	22	HSS
16	Demonstration of equipments and techniques in Molecular and Microbiology at Govt. Zemabawk Higher Secondary School, Aizawl, Mizoram	2 days; 22 nd – 23 rd Feb 2017	62	HSS
17	Awareness and demonstration of equipments and techniques in Molecular Biology at Govt. Central Higher Secondary School, Aizawl, Mizoram	1 day; 24 th March 2017	6	HSS
18	Admission Helpline for graduating students of Biotechnology and Zoology, Pachhunga University College	1 day, 28 th March 2017	40	B.Sc
19	Awareness programme for wide use of the Foldscope as	1 day, 10 th April	3	Faculty

	a research and education tool for Higher Secondary Schools of Aizawl Mizoram at Dept of Zoology, PUC	2017		
20	Demonstration of laboratory equipments for Govt. Synod Higher Secondary School, Aizawl, Mizoram	1 day, 19 th May 2017	56	HSS
21	Training on Mushroom Culture for graduating students of Pachhunga University College (Finishing School)	2 days, 22 nd & 23 rd May 2017	38	B.Sc
22	Awareness and demonstration of equipments and techniques in Molecular Biology for Oikos Higher Secondary School, Aizawl, Mizoram	1 day, 20 th June 2017	42	HSS
23	Awareness and Biotechnology Extension Programme at Govt. Ngopa High School	1 day; 12 th Jan, 2018	37	HS
24	Awareness and Biotechnology Extension Programme at Govt. Phuaibuang High School	1 day; 12 th Jan, 2018	80	HS
25	Biotechnology Extension Programme at Gandhi Memorial Higher Secondary School, Champhai	1 day; 12 th Jan, 2018	72	HSS
26	Biotechnology Extension Programme at Sacred Heart Higher Secondary School, Lunglei	1 day; 12 th Jan, 2018	103	HSS
27	Biotechnology Extension Programme at Synod Higher Secondary School, Aizawl	1 day; 2 nd May, 2018	82	HSS
28	Biotechnology Extension Programme at Dawrpui School of Science and Technology, Aizawl	1 day; 3 rd May, 2018	84	HSS
29	Biotechnology Extension Programme at Govt. Chaltlang Higher Secondary School, Aizawl	1 day; 4 th May, 2018	57	HSS

(c) Invited lectures/ trainings offered at other/nearby institutions:

Sl. No.	Name of the resource person	Topic	Organized by	Duration & Date
INVITED LECTURES				
1	Benjamin Lalruattluanga	<i>Bacillus thuringiensis</i> (bt) Technology	IBTHub Pachhunga University College	1 day – 6 th December 2013
2	Lalringngheti	PCR and its Applications	IBTHub Pachhunga University College	1 day – 6 th December 2013
3	P.B. Lalthanpuii	PCR and its Applications	IBTHub Pachhunga University College	1 day - 28 th March 2014
4	Dr.K. Lalchhandama	Medicinal Plants	IBTHub Pachhunga University College	1 day, 23 rd Jan 2017
5	Dr.Lalramliana	Road to species discovery	IBTHub Pachhunga University College	1 day, 23 rd Jan 2017
6	Dr.Rita Zomuanpuii	Biosafety concerns and pathogen discovery	IBTHub Pachhunga University College	1 day, 23 rd Jan 2017
7	Dr.C. Malsawmtluangi	Helminth parasite of Fishes	IBTHub Pachhunga University College	1 day, 23 rd Jan 2017
8	K. Thanzami	Prospect of food processing	RIPANS	22 nd July 2017
9	Prof. Lalnuntluanga, Dept. of EVS, Mizoram University	Biodiversity and its conservation	BT Hub, Pachhunga University College	1 day; 1 st August 2017
10	Dr. HT Lalremsanga Dept of Zoology, Mizoram University	Herpetofauna with special reference to Mizoram	BT Hub, Pachhunga University College	1 day; 1 st August 2017
11	Prof. N. Senthil Kumar Dept. of Biotechnology, Mizoram University	Advances in Biotechnology	BT Hub, Pachhunga University College	1 day; 26 th Sept 2017
12	Dr. Lalramliana Dept. of Zoology, Pachhunga University College	On the road to Species discovery	BT Hub, Pachhunga University College and DBT-BLISS, GHSS Zemabawk	1 day; 3 rd Oct 2017
13	Dr. K. Lalchhandama	Medicinal Plants	BT Hub, Pachhunga	1 day; 3 rd Oct 2017

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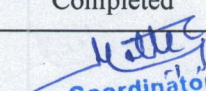
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	Dept. of Zoology, Pachhunga University College		University College and DBT-BLISS, GHSS Zemabawk	2017
14	Dr. Malsawmtluangi DBT-WOSA, Dept. of Zoology, Pachhunga University College	Helminth parasites and their Importance	BT Hub, Pachhunga University College and DBT-BLISS, GHSS Zemabawk	1 day; 3 rd Oct 2017
15	Dr. Samuel Lalronunga NPDP, Dept. of Zoology, Pachhunga University College	Herpetology and Conservation status in Mizoram	BT Hub, Pachhunga University College and DBT-BLISS, GHSS Zemabawk	1 day; 3 rd Oct 2017
16	Dr. H. Lalthanzara Dept. of Zoology, Pachhunga University College	Biodiversity status of Mizoram	BT Hub, Pachhunga University College and DBT-BLISS, GHSS Zemabawk	1 day; 3 rd Oct 2017
TRAININGS				
17	K. Vanlalmangaihi	Gel Electrophoresis	IBTHub Pachhunga University College	1 day - 28 th March 2014
18	Dr. Rita Zomuanpuii DBT-WOSA, Dept. of Zoology, Pachhunga University College	Biosafety	BT Hub, PUC and DBT-BLISS, GHSS Zemabawk	1 day; 3 rd Oct 2017
19	Lalfakzuala, Entomologist, IDSP, GOM	Status of vector borne disease with special reference to dengue and scrub typhus	BT Hub, Pachhunga University College	23 rd April 2018
20	Dr. Pachuau Lalmalsawma, State nodal officer, IDSP, GOM	Epidemiology of scrub typhus and dengue in Mizoram	BT Hub, Pachhunga University College	23 rd April 2018

11. Whether any R&D activities undertaken using biotech hub facilities, if yes, please provide details (title of the project, status etc.):

Sl. No.	Title of the research	Persons involved	Status (Ongoing/completed)
1	DNA barcoding of fishes, amphibians, lizards and snakes of Mizoram. (College sponsored Minor Project)	Samuel Lalronunga & Vanramliana	Completed
2	Diversity of the mitochondrial cytochrome oxidase C subunit I (COI) gene of the genus Schistura (Teleostei: Nemacheilidae) from Mizoram, NE India. (Internship for MSc. Biotechnology)	Cindy Lalremtluangi St. Xavier's College, Mumbai	Completed
3	Isolation and DNA characterization of endosymbiotic bacteria from Soyabean fermented food (Bekang)	Lalmuanpuii	Ongoing (2017)
4	Morphological and molecular characterization of ginger soft rot pathogenic fungi in Mizoram	Dr. G. Rosangkima Research Associate IBT hub	Ongoing (November 2017)
5	Morphological and Molecular Characterization of Brinjal Cultivars (Solanum species) using RAPD Primers.	Dr. Chhungpuii Khawlhring	Ongoing (January 2018)
6	Barcoding of Hawkmoths (Sphingidae/Lepidoptera) in Aizawl City Area	Lainghahpuii JRF	Ongoing (March 2018)
SANCTIONED PROJECTS			
7	Characterization and DNA Barcoding of fishes from Mizoram: National Associate ship	Dr. Lalramliana (DBT) (52 lakhs)	Completed
8	Morphological and molecular characterizations of helminth parasite of fresh water fishes	Dr. C. Malsawmtluangi (DST Women Scientist)	Completed


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9	Evaluation of etiologic factors and vitamin D receptor (VDR) start-codon FokI polymorphism associated with high prevalence of urolithiasis in the selected urban areas of Mizoram and Manipur	Dr. K Birla Singh (DBT) (44 lakhs)	Completed
10	Analysis of two genes associated with Anti-malarial drug resistance and also target genes for developing vaccines in Mizoram, NE-India	Dr. Rita Zomuanpuii (DST women Scientist)	Completed
11	Molecular characterization of fishes of the family Sisoridae (Actinopterygii: Siluriformes) from three drainages (Barak-Meghana, Karnaphuli and Kaladan) in Mizoram. (Post-Doctoral)	Dr. Samuel Lalronunga (SERB)	Ongoing
12	Morphological and molecular characterization of entomopathogenic nematodes in Mizoram, NE India	Dr. Lalramliana DST (SERB) (36 lakhs)	Completed
13	Diversity analysis and DNA Barcoding of earthworms of NE India	Dr. H. Lalthanzara (DBT) (61.58 lakhs)	Ongoing
14	Molecular and Biochemical characterization of symbiotic bacteria associated with entomopathogenic nematodes (Steinernematidae and Heterorhabditae)	Dr. Lalramliana DST-Mizoram (2.2 lakhs)	Ongoing
TRAINEESHIP			
15	Phylogenetic Analysis on Culex sp. in Mizoram	Benjamin Lalruattluanga(Sponsored by State Biotech Hub)	Completed
16	A study on Molecular Phylogeny of fish Species in Mizoram	PB Lalthanpuii(Sponsored by State Biotech Hub)	Completed
17	A study of Molecular Phylogeny of Aedes mosquito species in Mizoram	K Vanlalmangaihi (Sponsored by State Biotech Hub)	Completed
18	Molecular characterization of insect nematode	H.C. Lalramnghaki	Completed
19	Isolation and DNA characterization of endosymbiotic bacteria from entomopathogenic nematodes	Lalramluahpuii & Anne Lalrawngbawli (Sponsored by State Biotech Hub)	Completed
PH.D PROGRAMME			
20	Study of Bionomics of Malaria Vectors in Jhum Cultivated Huts In Aizawl District of Mizoram	Dr. Vanramliana	Completed
21	Study of ichthyofaunal diversity and distribution of selected rivers of Mizoram draining into barak river, India	Dr.Samuel Lalronunga	Completed
22	Molecular identification of wild silk moth	Esther Lalhmingliani, MZU	Completed
23	Genetic divergence and phylogenetic relationship of honey bee population in Mizoram	Liansangmawii, MZU	Completed
24	Morphological and Molecular Characterization of Culex mosquitoes of Aizawl, Mizoram	Lalringngheti	Ongoing
25	Molecular characterization of entomopathogenic nematodes and their bioefficacy against major insect pest in Mizoram	H.C. Lalramnghaki	Ongoing
26	Ecological studies on grey peacock pheasant Polyplectron bicalcaratum (Linn., 1758) in the tropical forest of Mizoram India	Lalawmawia Sailo	Ongoing
27	Chemical characterization and study of the anthelmintic activity of Acmella oleracea	P.B. Lalthanpuii	Ongoing
28	Comparative study on soil macrofauna under shifting cultivation and forest ecosystem in Mizoram, India	Betsy Zodinpuii	Completed

12. Whether any paper published in national/international peer reviewed journals, if yes, please cite bibliographic references (mention only papers emerged out of biotech hub support with acknowledgement of biotech hub/DBT):

- i. K. Vanlalhmangaihi, Lalramliana, Vanramliana. Mosquito borne dengue: potential disruption to wildlife and the importance of molecular identification of the vector species. Proceedings of "Issues of wildlife conservation in India with special references to Mizoram" Mizoram, India ISBN: 978-81-924321-7-5 227-232
- ii. P.B. Lalthanpuii, Lalramliana, Vanramliana. DNA Barcoding for Wildlife Conservation: A preliminary investigation on cryptic fish species of Mizoram. Proceedings of "Issues of wildlife conservation in India with special references to Mizoram" Mizoram, India ISBN: 978-81-924321-7-5 216-221
- iii. Lal Ringngheti, Lalramliana and Vanramliana. Barcoding Culex mosquitoes: a potential vector of Japanese Encephalitis in Mizoram. Proceedings of workshop on current trends of Biodiversity research in Mizoram.
- iv. C. Malsawmtluangi*, Lalramliana and Vanramliana. A preliminary study on the helminth parasite of freshwater fishes in Mizoram, northeast India. Proceedings of workshop on current trends of Biodiversity research in Mizoram
- v. Rita Zomuanpuii, Christopher L. Hmar, Vanramliana and N. Senthil kumar. A report on Japanese encephalitis in Mizoram: clinical investigation and diagnosis., Science Vision, 15(4)- 196-200, October-December, 2015, ISSN (print) 0975-6175 ISSN (online) 2229-6026.
- vi. H.C. Lalramnghaki, Vanlalhlmpuia, Vanramliana and Lalramliana. Effect of temperature on the infectivity of entomopathogenic nematodes (Steinernematidae and Heterorhadtidae) isolated from Mizoram, northeastern India. Science Vision 16 (1) January-March, ISSN (print) 0975-6175, ISSN (online) 2229-6026.
- vii. Lalramnghaki, H. C. et al. "Characterization of a new isolate of entomopathogenic nematode, Steinernema sangi (Rhabditida, Steinernematidae), and its symbiotic bacteria Xenorhabdus vietnamensis (γ -Proteobacteria) from Mizoram, northeastern India." 2017 Journal of Parasitic Diseases: 1-9
- viii. Malaria: Challenges on drug resistant genes and vaccine development. Proceedings of Mizoram Science Congress, 2016 page 121-126.
- ix. Lalronunga, S. and Lalrinchhana, C. (2017) Morphological and molecular characterization of *Theloderma moloch* (Anura: Rhacophoridae) from Indo-Burma biodiversity hotspot of northeast India. Science Vision, 17 (3): 148-159. (ISSN:2229-6026)
- x. Lalronunga, S., Vanramliana, Sailo, L. and Lalrinchhana, C. (2017) *Nasutixalus jerdonii* (Jerdon's bubble-nest frog): First record from Mizoram. Herpetological Review, 48 (3): 585. (ISSN: 0018-084X)
- xi. Lalronunga, S., Vanramliana and Lalrinchhana, C. (2017) *Fejervarya asmata* (Bangladeshi cricket frog): First record from India. Herpetological Review, 48 (3): 584. (ISSN: 0018-084X).
- xii. Vanlalhlmpuia, Lalramliana*, Hrang Chal Lalramnghaki & Vanramliana. Morphological and molecular characterization of entomopathogenic nematode, *Heterorhabditis baujardi* (Rhabditida, Heterorhabditidae) from Mizoram, northeastern India. 2018, Journal of Parasitic Diseases, Springer, ISSN: 0971-7196 (print version)
- xiii. Pathogenicity of two species of locally isolated entomopathogenic nematodes (Steinernematidae) from Mizoram, India against cloudless sulphur butterfly (*Phoebis sennae*) under laboratory conditions. Mizoram Science Congress 2018.
- xiv. Lal Ringngheti, Van Ramliana and Lalnunluanga. DNA Barcoding of Japanese encephalitis vector *Culex pseudovishnui* and *Culex tritaeniorhynchus* of Aizawl, Mizoram. 2018, 12th Annual Convention of ABAP & International Conference on Biodiversity, Environment and Human Health: Innovations and Emerging Trends (BEHET)
- xv. Hrang Chal Lalramnghaki, Hmartlawnte Lalremsanga, Vanramliana & Lalramliana. Evaluation of four entomopathogenic nematodes (Steinernematidae and Heterorhabditidae) from Mizoram, India

- against *Pycnarmon cribrata*. 2018, 12th Annual Convention of ABAP & International Conference on Biodiversity, Environment and Human Health: Innovations and Emerging Trends (BEHIET)
- xvi. G. Rosangkima, Vanramliana, H. Lalthanzara, Lalringngheti, H. C. Lalramnghaki. Isolation and Molecular Characterization of ginger soft rot pathogenic fungi in Aizawl District of Mizoram, India. (2018) Science Vision, 18(4) : 111-119

13. Manpower Recruitment Details in respect to DBT sanctioned position (since inception):

Sl. No	Name	Designation	Specialization	Period of engagement
1	Lalringngheti	SRF	Biotechnology	2012 till date
2	Vanlalmalsawma	Lab Attendant		2012 till date
3	G. Rosangkima	R.A.	Cell Biology & Immunology	2017 till date
4	H.C. Lalramnghaki	JRF	Endocrinology & Reproductive Biology	2017 till date

14. How many students were enrolled for Ph.D. and how many awarded degree so far and their placement status:

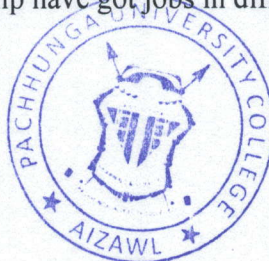
No. of Ph.D. enrolled	No. of Ph.D. awarded	Placement Status
10	3	One as Asst. Professor in Govt. Serchhip College One as DST Post-Doctoral Fellow in PUC One as Guest Faculty in Zoology Dept., PUC

15. Number of students trained by biotech hub since its inception:

Sl No	Programme/Level	Number
1	Ph.D Scholars	25
2	PG	44
3	UG	184
4	HSS/HS	1677
5	College Faculty	66
6	HSS Lecturers	55
7	Seminar (UG)	60
8	Admission Helpline (UG)	40
	TOTAL	2151

16. Status of the trained students (whether placed somewhere or not)

- *90% of trained students pursue higher studies.
- *10 trained students through traineeship have got jobs in different fields.
- *1 cleared CSIR NET-JRF,
- *2 cleared CSIR NET,
- *2 cleared SET and
- *10 pursued Ph.D.



Kattel
Coordinator
Internal Quality Assurance Cell
Pachhunga University College
(A constituent college of Mizoram University)

17. Whether any entrepreneurship activities initiated in your area :

IBT Hub Pachhunga University College have also conducted entrepreneurship training in Mushroom cultivation for many students and local farmers. The IBT Hub also supplied the required mushroom seeds for farmers.

[Signature]
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Pachhunga University College
Aizawl : Mizoram

18. Measurable achievements of the biotech hub since its inception:

- Modernization of laboratory for life science branch.
- All faculties in Life Science were trained under IBT Hub.
- Teachers were trained to enable them to attain project sanctioned through Molecular techniques. Two projects, DBT Twinning and DST projects have been sanctioned due to creation of Molecular Biology Laboratory in the college.
- Two faculties have been selected for DBT-National and International Associate ship.
- Student's practical's can be conducted at the laboratory especially for Botany, Zoology and Biotechnology.
- Research scholars and Post PG Students were trained in the hub for their present and future research respectively.
- Provides employability skills to trained students.
- The College receives NAAC A+ in 2016. The hub has a positive impact on NAAC assessment. The work carried out at the centre was positively mentioned at the NAAC peer team report.
- Provides increased student's exposure to enable them to attain good result. Life Science Department has the best result amongst all the other colleges under Mizoram University.
- Aids in granting of UGC-College with Potential for excellence.
- 11 Higher Secondary Schools received DBT-BLISS project under the consultation of IBT Hub, Pachhunga University College.
- The hub performance was rated high by DBT and promoted to "Advanced level Biotech hub in 2017".
- Conducts 29 outreach programmes for Urban and rural HSS and High School.
- Conducts 19 hands on training for college, university and HSS faculties for duration of 3 days to 1 month.
- Provides consultation, organize programmes with DBT-BLISS HSS and DBT Foldscope programme.
- Hosted 2 DST women Scientists and one Post-doctoral fellows.
- Conducts training for PG students- Studentship training sponsored by State Biotechnology hub.
- Diagnose 1st ever case of JE Virus in the state of Mizoram.
- Conducts workshop/hands on programme with 3 rural Colleges.
- We Could fulfill the recommendation of 7th Coordinators meeting by organizing more invited lecture (11 persons).
- We could provide support to DBT BLISS schools by organizing hands on training at their school with resource persons and some equipment and consumables from the IBT hub.
- We could organize outreach programmes and in-house training to students within the college.
- We could provide support to all life science branches (Botany, Biotechnology and Zoology) for their practical and project.
- We could provide faculty training and research collaborations with PG department.
- We could conduct workshop for secondary teachers to apply BLISS and foldscope projects. Out of 11 sanctioned from Mizoram 10 schools participate in the workshop. 1 project sanctioned under DBT foldscope programme.
- Completion of separate floor for Advanced Level Biotech hub.
- We could submit 265 sequences of nucleotides at NCBI-Gen Bank databank.
- We could organize Online lecture on Chemical Ecology with National Centre for chemical biology.

19. Impact made by Institutional Level Biotech Hub at your organisation:

A. Impact on students' intake (No. of students seeking admission in stream):

Level of Education	In the year before establishment of Hub		Average in last three years		% deviation (+ or -)	
	Male	Female	Male	Female	Male	Female
+2 Level						
Graduate level	87	177	300	392	+	+
PG level	NA	NA	20 (2018)	24 (2018)	+	+

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Coordinator
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B. Impact on students' results in science stream (% students passed in Final Board/University Examination):

Level of Education	In the year before establishment of Hub		Average in last three years		% deviation (+ or -)	
	Male	Female	Male	Female	Male	Female
+2 Level						
Graduate level	82.5	84.5	87.15	91.13	+	+
PG level	NA	NA	9	9	+	+


C. Outstanding results in last three years, if any in Biology stream only:

Level of Education	2015-16	2016-17	2017-18	2018-19
+2 Level				
Graduate level	21 students got rank out of possible 30 under Mizoram University Examination	18 students got rank out of possible 30 under Mizoram University Examination. 1 student from zoology secure GOLD MEDAL , top scorer in all Science stream.	20 students got rank out of possible 30 under Mizoram University Examination. 1 student from Botany secure GOLD MEDAL , top scorer in all Science stream.	20 students got rank out of possible 30 under Mizoram University Examination 2018
Post graduate level	NA	NA	NA	Initiation of PG

D. Impact on postgraduate research (since establishment of the Hub):

Degree Level	No. of students doing research directly in the Hub		No. of students using one or more equipments available in the Hub	
	In-house	External	In-house	External
Master's	6	6	6	3
Ph.D.	2		5	3





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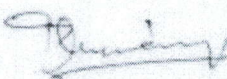
20. Future action plan of the biotech hub.

- To conduct an innovative outreach/hands on training programmes in schools and colleges within the state to promote biotechnology, research and development among the students in particular.
- To conduct workshop with rural colleges within Mizoram.
- To collaborate with neighboring Institutes for workshop and research and development.
- To train post-graduate students for their future research.
- To train Ph.D scholars for modern biology.
- To enhance the current syllabus for students efficiency.
- To provide training to College and HSS faculties.
- To continue support to DBT-BLISS Schools.
- To continue support to students with biotechnology practicals.
- To support M.Sc life Science.
- To continue current research and collaboration, initiate new research on tissue propagation of orchids and research collaboration on Vector borne disease.
- To organize invited lecture and special talks, discussion and workshops.


D. VANRAMLIANA

(Name & signature of Coordinator)

Co-ordinator
IBT hub
Pachhunga University College



(Name & signature of the Head of the Institution/Organization with seal)

Principal
Pachhunga University College
Aizawl : Mizoram




Principal
Pachhunga University College
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