

**Facility available and Workshop / Training programs organized through DBT-Advanced State Biotech Hub , Mizoram University**

1. Name & address of the institution: **Mizoram University**  
(A Central University - Accredited with "A Grade" by NAAC)  
Aizawl – 796 004, Mizoram
2. Name & Designation of the Coordinator: **Prof. N. Senthil Kumar**  
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4. Level of the Biotech Hub: **Advanced Level State Biotech Hub**
5. Year of the sanction of biotech hub: 2011-12
6. Infrastructure created:  
(a) List of equipment procured :

Sl. No.	Name of the equipment	Model number and brand name	Date of Purchase	No. of Persons utilized equipments
1	Gel Documentation System (1D & 2D Gel Imaging & analysis system for chemiluminescence & Fluorescence Visualization)	G.box Synoptics Ltd.	28-03-2011	1560
2	UV-Visible Spectrophotometer (190 –1100 nm, measuring < 4 µL samples accurately and reproducibly)	Cary 60 UV Agilent Technology	29-03-2011	1522
3	Bead Beater (Extract DNA, RNA, proteins, and metabolites)	Precellys 24 Bertin	28-03-2011	251
4	Refrigerated Centrifuge 5810 R (-9 °C to 40 °C, Max speed 13,800 rpm)	5810R Eppendorf	28-03-2011	1502
5	Ice Flaking machine	SPR80 Sigma	28-03-2011	556
6	NBS Galaxy CO <sub>2</sub> Incubator (comprehensive and rapid analysis of real time, Optical CO <sub>2</sub> /O <sub>2</sub> Control, Humidity control)	170R New Brunswick	26-03-2011	422

7	NBS Bench Top refrigerated Incubator (Wide speed range with incubation, humidity monitoring, remote alarm, refrigeration, photosynthetic lighting, UV germicidal lighting and in-flask gassing, enables growth of virtually any cell type)	INOVA 42 New Brunswick	26-03-2011	1200
8	Spectramax R M2e Microplate Reader (Cuvette detection and Multi detection microplate reader for fluorescence, UV/Vis, Luminescence )	Molecular Device	26-03-2011	1132
9	Optica XDS-3 Inverted PC Microscope (Plan-achromatic infinity corrected optics, bright 8W LED illuminator, phase contrast set, trinocular head for photo/video applications)	XDS-3 Optica	26-03-2011	231
10	Oxygen measuring System (Convenient, system for the advanced study of photosynthesis & respiration measurements in liquid-phase samples under illumination)	Cholorol2 Hansatech Instrument	26-03-2011	335
11	Heating / Water Bath	CW-30G Jeio-tech	26-03-2011	1221
12	PCR System (Extremely fast heating and cooling rates, Ultimate reduction of evaporation & Gradient blocks with SteadySlope® technology)	Vapo-Protect ProS Eppendorf	26-03-2011	2532
13	Electroporator (Optimized buffer system, Soft Pulse technology & Patented controlled pulse discharge)	Eppendorf	26-03-2011	220
14	Refrigerated Micro Centrifuge	5415R Eppendorf	26-03-2011	961
15	Computer HP pro 3330 Desktop	Pro-3330 HP	26-03-2011	972
16	Laminar Flow ( Horizontal 2 and Vertical)	Indian Instruments	06-12-2012	852
17	DNA Electrophoresis system (3Nos)	Tarsons	26-03-2012	1522
18	Hot air Oven	OMS-1518D Yoma	26-03-2012	661
19	PH Meter	ECPHS510425 Eutech	26-03-2012	1113
20	Proline Variable Vol. 100-1000µl	Proline SCVV Biohit	26-03-2012	1923

21	Proline Variable Vol. 10-100µl	Proline SCVV Biohit	26-03-2012	1632
22	Proline Variable Vol. 20-200µl	Proline SCVV Biohit	26-03-2012	1459
23	Proline Variable Vol. 2-20µl	Proline SCVV Biohit	26-03-2012	1642
24	Proline Variable Vol. 0.5-10µl	Proline SCVV Biohit	26-03-2012	1632
25	Proline Multi Channel Vol. 0.5-10µl	Proline SCVV Biohit	26-03-2012	1389
26	Proline Multi Channel Vol. 5-50µl	Proline SCVV Biohit	26-03-2012	950
27	Refrigerator	Samsung(Double door)	27-08-2012	2500
29	6KVA online UPS (One Unit)	New Circuit breaker	11-06-2012	Continuous
30	Analytical Balance (One Unit)	MS205DU Toledo	28-03-2012	1455
31	Mini Vertical Electrophoresis & Transbolt Western blotting System & Power Supply (2 Nos)	135-8003 Bio-rad	28-03-2012	2001
	952			
	2612			
32	Ultra Low Freezer (-20° C)	BFS-345-S Vestfrost	28-03-2012	Continuous
33	Autoclave (Vertical) (1 Nos)	Indian Instruments	26-03-2012	1774
34	Spinix TM MC-01 (2 Nos)	3020 Spinix™	26-03-2012	1526
	Rockymax TM	4080 Rocky™	26-03-2012	1187
	Spare Dimple mat		26-03-2012	
	Rotospin TM Rotary Mixer		26-03-2012	1534
	Bar for 50 x 1.5 ml tube		26-03-2012	
	Bar for 20 x 15 ml tube		26-03-2012	
	Magnetic Stirrer Hot plate 10 x10 cm		26-03-2012	2210
35	UV Transilluminator	MERCK Genei™	08-11-2012	3085
36	Gravi Trap kit	Wipro	11-06-2012	100
37	Refrigerated circulating water bath	Jeio tech RW 1025G	06-12-2013	561
38	Jeio tech Water Bath (korea make)	Model: BW-10g	26-03-2011	954
39	Hot Plate	Jeio tech Code No. 6040	26-03-2011	664
40	Deep Freezer (300 Ltrs)	Blue star (CHF 300 b)	07-02-2014	Continuous
41	Autoclave, 18" x 24", Vertical, 4 K.W.	Yoma, ATCV 1824	07-02-2014	
42	Vacuum Filtration Unit,	Millipore	07-02-2014	352
43	pH Meter	Eutech (ECPH51042S)	07-02-2014	1012
44	6 Micropipettes	Sartorius-Biohit	07-02-2014	5210
45	Weighing Balance	Sartorius, : BSA223S	07-02-2014	1264
46	Nano drop Spectrophotometer	Qubit - Life Technologies	05-11-2014	1200
47	PCR System	Proflex- Life	05-11-2014	1912

	<i>(Proflex 3X32 well triple block)</i>	Technologies		
48	Stereozoom	Medline Twin-Z	10-02-2014	560
49	CentriVap DNA Vacuum Concentrator <i>(Efficiently processing DNA/RNA samples)</i>	Thermo Scientific-SavantISS110	13-12-2013	450
50	Deep Freezer <i>(Microprocessor control with Max cooling upto -86° C)</i>	Forma Deep freeze -85°C	13-12-2013	Continuous
51	Refrigerated Microcentrifuge	Thermo Scientific-Heraeus Fresco 21	13-12-2013	1213
52	Microtome <i>(Section thickness 0.5 to 60 µm)</i>	Leica-RM2125RST	20-01-2014	853
53	Water filtration system with extra filter <i>(Extra Cartridge, Deionized and DNase/ RNase free water)</i>	MERCK millipore	05-12-2013	Continuous
54	Biolog <i>(Rapid identification of aerobic bacteria)</i>	Microlog-M	22-01-2014	520
55	N <sub>2</sub> Carrier (2 Pcs) (10L)	Surgical Pvt. Ltd.	06-12-2013	115
		Taylor Wharton, Id10	06-12-2013	
56	GPS System	Garmin-Montana 650	28-03-2104	786
57	Tissue Homogenizer	Himedia	28-03-2104	1520
58	Anaerobic system	Himedia	28-03-2104	53
59	Degenerating Gel Electrophoresis (TGGE,CSGE & SSCP)	BioRad D-Code system	13-12-2013	591
60	Protean II xi cell 16 x 20 cm.	165-1813	13-12-2013	492
61	Mini trans blot Tetra cell	165-8003	13-12-2013	200
62	Mini trans blot cell with tank		13-12-2013	123
63	Power pack	164-5050	13-12-2013	1849
64	Micro oven	Samsung	24-01-2014	4500
65	Refrigerator	Samsung 350 Litres.	24-01-2014	Continuous
66	Computer	HP Pavillion laptop	11-12-2013	Continuous
67	Rotavapor System with vacuum pump. <i>(Digital display, Tem 20-180°C &amp; Volume 50-4000 ml)</i>	Buchi R-210	06-06-2014	668
68	UV-Vis Digital Spectrophotometer	Systronic model-117	10-05-2014	531
69	TC 20 Automated cell counter	Bio-rad 14S-0102	10-05-2014	85
70	Spinwin (MC00) - 2 No.'s	Tarsons	30-01-2014	225
71	Spinwin (MC-01)	Tarsons	30-01-2014	1215
72	Mini submarine electrophoresis - 2 No.'s	Tarsons	30-01-2014	2510
	Casting tray, comb set			

73	Refrigerator 253 litres – 2 No.'s	Samsung	21-01-2014	Continuous
74	UPS Batteries – 16 No.'s	Circuit breaker	20-01-2014	Continuous
75	Microprocessor Controlled Vertical Autoclave (Temp.range -25 to 150°C, Microprocessor PID control/automatic tunning/calibration & Customizable cycle programmes)	Tuttanuer	10-05-2014	1321
76	Hot Air Oven	NSW	10-05-2014	546
77	Motorless magnetic stirrer	Tarsons	06-06-2014	215
78	pH meter with electrodes	Eutech	06-06-2014	568
79	Refrigerator 415 litres	Samsung	06-06-2014	Continuous
80	Class II, Type A2 biological safety cabinets 1300 Series A2	Thermo Scientific	06-06-2014	312
81	Chiller/ Refrigerated circulating water bath	Jeio tech	06-06-2014	251
82	Nexus GX2 PCR (Dual block)	Eppendorf	06-06-2014	1102
83	Micropipette Set (Range – 0.5 -10, 10 -100, 100 - 1000, 0.1-2.5 µL)	Eppendorf	06-06-2014	Continuous
84	Accessories, Maintenance, Spare parts		06-06-2014	-
85	Clearing and Forwarding charges from Kolkata Airport		27-03-2014	-
86	Lab table (4 Nos.) and 29 Nos. Chairs	MN Enterprises	11-04-2014	Continuous
87	HP Laser printer	HP-1020	07-10-2013	Continuous
88	Tables (Small & Big)	MN Enterprises	25-06-2014	Continuous
89	Glass door Storewel	MN Enterprises	22-10-2013	Continuous
90	Pigeon hole rack		22-10-2013	Continuous
91	Personal locker		22-10-2013	Continuous
92	Air Conditioner		07-10-2013	Continuous
93	Steel Book Case (4 Doors)		MN Enterprises	22-10-2013
94	Steel Almirah	22-10-2013		Continuous
95	Vacuum cleaner	Panasonic MC-CG304	22-10-2013	Continuous
96	UPS Batteries – 6 No.'s	Circuit breaker	15-03-2016	Continuous
97	E-Gel Imager System with UV light Base : A UV Light Base & a suitable Laptop to operate E-Gel System Capture gel image in real time with the integrated scientific grade camera and necessary software.	Applied Biosystems Cat. No. 4466611	18.12.2017	Continuous
98	Centrifuge (NEYA-16R)	Remi	18.12.2017	Continuous
99	Waterbath (RSB12-SS304)	Remi	18.12.2017	Continuous
100	ONLINE UPS (6 KVA)	Circuit breaker Model : ZPS-5	18.12.2017	Continuous

101	<p>Workstation - 02 No.'s (Dell Workstation 5810, Intel Xeon Processor E5 1660 V4 8C, 3.2Ghz 3.8Ghz turbo 2400Mhz, 20Mb, 140W 32GB DDR4 2TB HDD 24" Monitor Windows 10 Pro 3 years warranty *Nvidia 4GB graphics included)</p> <p>Laptop - 05 No.'s (Core i7 8th gen 8GB RAM, 2 TB HDD, 15.6", Dt: 07/03/18 Proforma Invoice/Quotation 4GB Graphics, Win 10+Off 3 year warranty)</p> <p>Desktop - 02 No.'s (Desktop Dell, Core i3 7th gen 8GB Ram, 1 TB HDD, 18.5" Monitor DVD writer, Keyboard, mouse 3 years warranty)</p>	DELL	20-03-2018	Continuous
102	Spares/ Accessories/ AMC for equipments	Eppendorf/ Millipore	23-03-2018	Continuous
103	8-Channel Micropipette Plus (3 Nos.) Volume ranges: 0.5 – 10ul; 5 – 50ul; 50 – 300ul	DLAB	10-03-2018	Continuous
104	QX200 Droplet Digital PCR System (Catalog # 1864001, 1814000, 1851197, 1863004, 1864006, 1864007, 12001925, 1864033, 864052, 181404)	Bio-Rad	10-03-2018	Continuous

7. Detail of hands on training programmes/workshops organized during the period of report:

(a) Hands on trainings Workshops conducted (2013-18):

Sl. No.	Title of seminar/course	Sponsoring Agency	Duration with Dates	No. of internal and external participants	Proceedings published Yes/No
1.	Workshop on Advance Molecular Biology Techniques	DBT - State Biotech Hub	19-20 Nov 2013	17	Yes
2.	Workshop on Advanced Molecular Biology Techniques (for M.Sc students)	DBT - State Biotech Hub	7-11 October 2014	20	Yes

3.	Techniques in Molecular Biology and Bioinformatics.	DBT - State Biotech Hub	17 - 23 January 2015	26	No
4.	Basic Techniques in Biotechnology (for B. Sc students).	DBT - State Biotech Hub	13 - 15 March 2015	25	No
5.	DBT sponsored one day awareness programme on the "Recent developments and basic tools in Biotechnology" (For Batch 1, Oikos School, Aizawl)	DBT - State Biotech Hub	26 Sept 2015	28	No
6.	DBT sponsored one day awareness programme on the "Recent developments and basic tools in Biotechnology" (For Providence School, Aizawl)	DBT - State Biotech Hub	02 Oct 2015	24	No
7.	Workshop on Basic Techniques in Animal Cell Culture	DBT - State Biotech Hub	14 - 18 Oct 2015	20	No
8.	Workshop on Basic Techniques in Animal Cell Culture	DBT - State Biotech Hub	21 - 23 Oct 2015	10	No
9.	DBT sponsored one day awareness programme on the "Recent developments and basic tools in Biotechnology" (For Dawrpui School of Science and Technology, Aizawl)	DBT - State Biotech Hub	24 Oct 2015	31	No
10.	Basic techniques in Molecular Biology and Bioinformatics	DBT - State Biotech Hub	29 Oct – 1 Nov 2015	13	No
11.	DBT sponsored one day awareness programme on the "Recent developments and basic tools in Biotechnology" (For St. Pauls School, Batch 1, Aizawl)	DBT - State Biotech Hub	31 Oct 2015	23	No
12.	DBT sponsored one day awareness programme on the "Recent developments and basic tools in Biotechnology" (For St. Pauls School, Batch 2, Aizawl)	DBT - State Biotech Hub	07 Nov 2015	23	No

13.	National Workshop on Microbial Genomics and Informatics	DBT - State Biotech Hub	02 – 09 Dec 2015	9	No
14.	Techniques in Molecular Biology and Bioinformatics	DBT – State Biotech Hub	26 - 31 Jan 2016	10	No
15.	Workshop on techniques in molecular biology and recombinant DNA technology	DBT- State Biotech Hub	16-18 Feb 2016	21	No
16.	Workshop on exploring the Cancer Genome	DBT – State Biotech Hub	22 - 27 Feb 2016	11	No
17.	Basic techniques in Molecular Biology	DBT – State Biotech Hub	20 – 24 March 2016	22	No
18.	Basic techniques in Molecular Biology	DBT – State Biotech Hub	4 – 8 April 2016	30	No
19.	Basic techniques in Molecular Biology	DBT – State Biotech Hub	13 – 15 April 2016	25	No
20.	Basic Techniques in Molecular Biology	DBT – State Biotech Hub	5- 9 May 2016	27	No
21.	International Level Workshop on Snakebite Management	DBT – State Biotech Hub	27 June – 03 July 2016	16	No
22.	Awareness Program On “Recent Developments and Basic Tools in Biotechnology” St. Pauls Hr. Sec. School (XII Sc.)	DBT - State Biotech Hub	24 Sept 2016	28	No
23.	Awareness Program On “Recent Developments and Basic Tools in Biotechnology” St. Pauls Hr. Sec. School (XII Sc.)	DBT - State Biotech Hub	16 Oct 2016	24	No
24.	Awareness Program On “Recent Developments and Basic Tools in Biotechnology” Providence Hr. Sec. School	DBT - State Biotech Hub	22 Oct 2016	21	No
25.	Awareness Program On “Recent Developments and Basic Tools in	DBT - State Biotech	29 Oct 2016	19	No



	Biotechnology” Don Bosco Hr. Sec. School	Hub			
26.	Awareness Program On “Recent Developments and Basic Tools in Biotechnology” Dawrpui School of Science and Technology	DBT - State Biotech Hub	12 Nov 2016	25	No
27.	Basic training program of tools and techniques on plant biotechnology.	DBT – State Biotech Hub	17- 22 Nov 2016	20	No
28.	International workshop on Cancer epidemiology	DBT – State Biotech Hub	29 Nov – 02 Dec 2016	25	No
29.	Workshop on DNA Barcoding and Phylogenetics.	DBT – State Biotech Hub	20 - 25 March 2017	22	No
30.	Basic Molecular Biology Techniques.	DBT – State Biotech Hub	20 March – 20 April 2017	2	No
31.	Techniques in Animal and Microbial Cell Culture	DBT – State Biotech Hub	16 – 18 May 2017	28	No
32.	Nucleic acid isolation, PCR, DNA Sequencing and Bioinformatics Analysis	DBT – State Biotech Hub	1 June – 31 July 2017	3	No
33.	One day science communication workshop	DBT - State Biotech Hub	6 June 2017	88	No
34.	Animal Cell Culture and MTT Assay	DBT – State Biotech Hub	9 - 15 June 2017	4	No
35.	International workshop on Molecular phylogeny and next generation sequencing and Molecular Entomology (GIAN)	DBT – State Biotech Hub	19 – 28 June 2017	30	No
36.	Basic tools on recombinant DNA technology. Pachhunga University College	DBT – State Biotech Hub	10-11 Aug 2017	20	No
37.	Basics of Molecular techniques and Lab equipments. Govt. K.M. Higher Secondary School	DBT – State Biotech Hub	14 Aug 2017	23	No

38.	DNA Isolation, PCR amplification, sequencing and phylogenetic analysis	DBT – State Biotech Hub	5 - 15 Oct 2017	2	No
39.	Workshop on “Advanced Techniques in Molecular Biology”	DBT – State Biotech Hub	20 – 24 Oct 2017	20	No
40.	Hands-on training on “Recent Developments and Basic Tools in Biotechnology”. Home Mission School	DBT - State Biotech Hub	21 Oct 2017	15	No
41.	Workshop on “Basic Techniques in Molecular Biology and Bioinformatics”	DBT – State Biotech Hub	08-11 Nov 2017	25	No
42.	Third NER Research Training Workshop On Understanding Human Disease and Improving Human Health Using Genomics-Driven Approaches (NIBMG)	DBT – State Biotech Hub	20 - 26 Nov 2017	35	No
43.	Training on “Sanger Sequencing and Fragment Analysis”	DBT – State Biotech Hub	26 Feb – 01 March 2018	10	No

(b) Seminars/awareness programmes conducted (2013-18):

Sl. No.	Title of seminar/course	Sponsoring Agency	Duration with Dates	No. of internal and external participants	Proceedings published Yes/No
1.	National Conference on Cancer Genomics	DBT - State Biotech Hub	22-23 July 2013	85	Yes
2.	<u>On the mechanism of cancer development</u> (Dr. Jeremy L. Pautu, Mizoram State Cancer Institute, Zemabawk, Aizawl -796017, Mizoram, India)	DBT - State Biotech Hub	23 Sept 2013	34	No
3.	Cloning and expression of foreign genes in E. Coli, Saccharomyces Cerevisiae (Prof. Ranjana Srivastava, Ph.D., CDRI, Lucknow)	DBT - State Biotech Hub	15 April 2014	46	No
4.	Discovery of a new drug and development of an animal model for in vivo screening (Prof. Ranjana Srivastava, Ph.D., CDRI,	DBT - State Biotech Hub	16 April 2014	46	No

	Lucknow)				
5.	Vaccines and Immunology (Prof. Brahm Srivastava, CDRI, Lucknow)	DBT - State Biotech Hub	17April 2014	38	No
6.	Applications of Sol-Gel techniques in Bio applications (Dr. V. Madhurima, CUTN)	DBT - State Biotech Hub	9May 2014	31	No
7.	Embryo transfer and Animal Reproduction (Dr. D. Kathiresan, M.V.Sc. Ph.D, Central Agriculture University, Aizawl)	DBT - State Biotech Hub	23 May 2014	35	Yes
8.	National Conference on Advances in Cancer Geomics	DBT-State Biotech Hub	30-31 May 2014	25	No
9.	Interactive Session with M.Sc. Students and Research Scholar (Prof. T.P. Singh, Distinguished Biotechnology Research Professor, AIIMS)	DBT - State Biotech Hub	18 Sept 2014	29	No
10.	Interactive Session with M.Sc. Students and Research Scholar (Prof. H.P. Puttaraju, Professor of Life Sciences and Coordinator Biological Sciences, Bangalore University)	DBT - State Biotech Hub	18 Sept 2014	29	No
11.	Application of mass spectrometry in chemical profiling of medicinal plants (Dr. Brijesh Kumar, Incharge – Sophisticated Analytical Instrument facility (SAIF), CDRI, Lucknow, U.P)	DBT - State Biotech Hub	4 Dec 2014	48	No
12.	Facilities available at Sophisticated Analytical Instrument facility (SAIF), CDRI, Lucknow,U.P (Dr. Brijesh Kumar, Incharge – Sophisticated Analytical Instrument facility (SAIF), CDRI, Lucknow, U.P)	DBT - State Biotech Hub	4 Dec 2014	48	No
13.	Lecture on “Cancer Mutations Study” (Dr. Swarkar Sharma, Associate Professor, Department of Biotechnology, Shri Mata	DBT - State Biotech Hub	17 April 2015	33	No

	Vaishno Devi University)				
14.	Interactive Session with M.Sc. Students and Research Scholar (Prof. D.N. Tiwari, Emirates Professor, Department of Botony, BHU, Varnasi)	DBT - State Biotech Hub	14 May 2015	35	No
15.	Insights into tissue engineering (Prof. Utpal Bora, Dept. of Biosciences and Bioengineering, IIT, Guwahati)	DBT - State Biotech Hub	18 May 2015	50	No
16.	Interaction between the cytoskeletal protein Gelsolin and antioxidant, Cu/ZnSOD: Partners in Crime – Cancer Focus (Dr. Lalchandami Tochhawng, Dept. of Biotechnology, Don Bosco University, Ghuwahati, Assam)	DBT - State Biotech Hub	31 Aug 2015	25	No
17.	Dr. Krishna Kumar Ojha, Centre for Bioinformatics, Central Univ. South Bihar - Lecture on Molecular Dynamics and Simulation: perspectives and challenges.	DBT - State Biotech Hub	12 Dec 2016	25	No
18.	Dr. Brijesh Kumar Professor (AcSIR) & Senior Principal Scientist Locknow – Lecture on Advanced Spectroscopic Techniques used for Phytochemical Screening of Medicinal Plants	DBT - State Biotech Hub	10 Feb 2017	26	No

(c) No. of students doing project works using biotech hub facility:

PG: 136

M.Phil: 12

Ph.D.: 16

(d) Courses/Study programmes supported (by biotech hub infrastructure & facilities)

Sl. No.	Level	Name of the Course/ Study programme	Nature of support
1	PG/ Ph.D	Botany	Training, Equipments & Consumables, Project Work
2	PG/ M.Phil / Ph.D	Zoology, Biotechnology	Training, Manpower, Equipments & Consumables, Project Work
3	Ph.D	Chemistry, Env. Science	Training, Equipments & Consumables
4	PG/ Ph.D	Forestry, HAMP	Equipments & Consumables, Project Work
5	PG	M. Pharm	Training and Project Work

6	UG	Biotechnology	Training & Equipments
7	UG	Biochemistry	Training

8. R&D activities undertaken using biotech hub facilities:

(a) Type of work carried out:

Sl. No	Title of the research	Persons involved	Status
1.	Mitochondrial (D-loop and Cytochrome Oxidase I) and Nuclear (Tp53, GST and CDH1) gene polymorphisms and mutation studies associated with Gastric and Breast cancer in Mizo population, Northeast India,	Souvik Ghatak, N. Senthil Kumar , R. Muthukumaran, Dr. Jeremy L Pautu, Dr. John Zohmingthanga	Ongoing, (Seven papers published)
2.	Genotyping of <i>Helicobacter pylori</i> among Mizo population and relation with gastric cancer	Subhajit Mukherjee, N. Senthil Kumar, Dr. Jeremy L Pautu and Dr. Lalrintluanga Jahau	Ongoing
3.	Characterization of soil microbial communities in Mizoram through culture independent methods	Surajit De Mandal, N. Senthil Kumar	Ongoing (Six papers published)
4.	Studies on genetic variations and antioxidant potential of wild-seeded banana found in North-East India and <i>in vitro</i> propagation of the elites.	Thangjam Premabati and Th. Robert Singh	Ongoing
5.	Molecular phylogeny and DNA barcoding of snakes from Mizoram, Northeast India.	H.T. Lalremsanga, Souvik Ghatak, S. Sarath Babu, Andrew Vanlallawma, N. Senthil Kumar	Ongoing
6.	Genetic and Molecular Characterization of ISWI chromatin remodeling complexes in <i>Candida albicans</i>	Lalremruata Hahnar and H. Lalhruaitluanga	Ongoing
7.	Gut microbiome in Gastric Cancer patients in Mizo population, North East India	K. Syed Ibrahim, N. Senthil Kumar	Ongoing
8.	Mutation study of BRCA1 gene associated with Breast cancer in Mizo population, Northeast India.	Doris Zodinpuui, R. Muthukumaran, Souvik Ghatak, Ashok Varma, N. Senthil Kumar	Ongoing
9.	DNA fingerprinting of endophytic actinomycetes & screening for their antimicrobial activities.	Ajit Kumar Passari, B.P Singh	Ongoing (Two paper published)
10.	Screening & molecular characterization of endophytic fungi for secondary Metabolites	Vineet Kumar Mishra, B.P Singh	Ongoing (Two paper published)
11.	Oxidative stress in cyanobacteria, <i>Nostoc punctiforme</i> .	Loknath Samanta, J. Bhattacharya	Ongoing
12.	Study of gene mutations related to Diabetes among Mizo population	Freda Lalrohlu, N. Senthil Kumar	Ongoing (One paper published)
13.	Isolation and Molecular characterization of phosphate solubilizing bacteria of Aizawl region	Vincent vineeth Leo, B.P Singh	Ongoing (One paper published)

14.	Antimicrobial, anticancer and pharmacological activity of some traditional medicinal plants from Mizoram	Garima Singh, B.P.Singh, S. Sarath Babu, Ajith Kumar Passari, N. Senthil Kumar	Completed (One paper published)
15.	Antioxidant activity & Phylogenetic relationship of various <i>Phyllanthus</i> Species in Mizoram.	Malsawmdawngliana, Surajit de Mandal, N. Senthil Kumar	Ongoing
16.	Genomics-driven Dissection of Susceptibility and Drug Resistance to Pulmonary Tuberculosis, with a Geographical Focus on NER	Mary Vanlalhruii Tonsing, Christine Vanlalbiakdiki Sailo, N. Senthil Kumar	Ongoing
17.	Observation cross-sectional retrospective cum prospective study on epidemiological, clinicopathological and molecular factors associated with colorectal cancers in North Eastern India	Litika Vermani, N. Senthil Kumar	Ongoing
18.	Analyzing bacterial community and its functional attributes in the contaminated sites of Mizoram	Surajit De Mandal, Vabeiryureilai Mathipi, N. Senthil Kumar	Ongoing
19.	DNA bar-coding of Earthworm	Vabeiryureilai Mathipi, Surajit De Mandal, N. Senthil Kumar, Lalthanzara, Ruth Lalfelpuii	Ongoing
20	Study of microbial communities in fermented Soyabin (Bekang).	Vabeiryureilai Mathipi, Surajit De Mandal, G. Rosangkim, N. Senthil Kumar	Ongoing
21	Molecular characterization of Mushrooms in Mizoram	Zohmangaiha, John Zothanzama, N. Senthil Kumar.	Ongoing
22	Isolation and molecular characterization of <i>Listeria</i> sp.	Deepika Malakar, N. Senthil Kumar	Ongoing
23	Anticancer potential of medicinal plants from Mizoram	R. Sakthivel	Ongoing
24	Biomarker Research in Pediatric Leukemia	Andrew Vanlallawma, N. Senthil Kumar, Dr. Jeremy L Pautu, Dr. John Zohmingthanga	Ongoing

(b) Collaboration with other departments/institutions:

Sl. No.	Dept./Institution collaborated	Nature of collaboration	Duration
1.	NIBMG, Kalyani, West Bengal, Mizoram State Cancer Institute, Mizoram and ACTREC, Mumbai	Research on Cancer Genomics	3 years
2.	Pachhunga University College, Aizawl	DNA Barcoding of earthworm species	3 years
3.	SMVDU, Jammu	Mutational analysis of genes linked with Diabetes	2 years
4.	VIT, Vellore, Tamilnadu	Detection of <i>MecA</i> gene is MRSA	2 years

9. Major achievements of the Biotech Hub during the year:

- Trainings and workshops conducted for University, College and School students on Metagenomics and Cancer Genomics.
- Diverse research areas have been initiated and carried out in collaboration with other departments and institutes.
- Significant publications in International journals.
- Large number of students and scholars utilizing the facility, which helps them to complete their course.
- Biotechnological or Molecular Biology experiments and tools are being performed by other departments like Forestry, Chemistry, Zoology, Botany, Horticulture.
- Consultancy and mentoring services are being provided to the institutional biotech hubs and senior secondary schools under BLiSS programme of the state.
- Support for students for their research work.

10. Service provided:

(a) No. of students/workers utilizing the facilities:

Twenty three **II year M. Sc. Biotechnology students** completed their project work using the Advanced State Biotech Hub facilities. Twenty two Research Scholars / **PhD students and Project Fellows** of the School of Life Science departments are using the lab. Facilities for their project / research work.

- Mr. Zohmangaiha, Department of EVS, Ph.D. Scholar, Mizoram University, topic “DNA barcoding of Mushroom Sp.”
- Ms. Phoebe Lalremruati, from Dept of Zoology Mizoram University, Ph.D. Scholar. Topic “Molecular Characterization of Primates in Mizoram”.
- Ms. Tasi Chera Marak from Dept. of HAMP, Mizoram University, completed her dissertation work on “Phylogenetic Analysis of Different Curcumin From North East India”.
- Mr. David Lalvohbika Kaipeng, Dept. of Microbiology Tripura University, Ph.D Scholar for “DNA sequencing and Analysis”.
- Mr. Michael Lalchhuanawma, Dept. of Zoology, Mizoram University, working as a project fellow in “DNA barcoding of snakes in Mizoram”.
- Mr. Karuppasamy Chellapandi, Dept. of Microbiology, Assam University, Ph.D. Scholar, topic- “DNA sequencing and Analysis”.
- Dr. Folguni Laskar, IBH, Karimganj College. Research Associate, Training on “Molecular Techniques in Community Level Study of Soil Microorganism”.
- Mr. Krishna Murthy, Dept. of Zoology, Mizoram University, completed his M.Phil successfully on Tobacco induced changes in salivary enzymes and associated DNA damage“.
- Mr. Sambanduram Samarjit Singh, Dept. of Biotechnology, Mizoram University, successfully completed his M.Phil. on “Characterization of Potential Probiotic

Bacterial strains isolated from traditionally fermented fish and their effect on cancer cell lines“

- Ms. Indira Sonar, Dept. of Biotechnology, Mizoram University successfully completed her M.Phil on “Study of ATM (ataxia-telangiectasia mutated gene profile in Breast Cancer patients among Mizo Population“
- Mr. S. Sarath Babu, Dept of Biotechnology, Mizoram University completed his Ph.D. successfully on the topic: “Characterization and cytotoxic activity of Pierisin from white cabbage butterfly (*Pierisin Candidia L.*)“
- Mrs. Garima Singh, Dept. of Biotechnology, Mizoram University completed her Ph.D successfully on the topic: “Evaluation of Bioactive Potential and Phylogenetic Analysis of selected species of family Asteraceae”
- Dr. Ruth Lalfelpuii, Dept. of Zoology, PUC, utilizing the facility for “DNA barcoding of Earthworm species”.
- Mrs. Joanne Zote, Dept. of Biotechnology, Mizoram University completed her M.Phil. on “Bacterial population associated with mud crab and their antimicrobial potential”.
- Mr. Loknath, Dept. of Biotechnology, Mizoram University is working on Redox Biology in Blue Green algae

**(b) Services provided to other Biotech Hubs/ Sr. secondary schools/ Agencies/ Departments:**

- Mentoring and advisory services are being provided to the **Institutional Biotech Hub** (Pachhunga University College, Aizawl – Visited 2 times for delivering lecture and interactions with teachers and students) and under the **BLISS programme** Secondary School (St. Paul’s Higher Secondary School, Aizawl - Visited 2 times for delivering lecture and interactions with teachers and students).
- Consultancy services are being provided to the **Chief Wildlife Warden**, Mizoram for identification of Wild Buffaloes using Gene Sequencing and Bioinformatics tools.
- Consultancy is being provided to local farmers about Mushroom Production.

11. Future activities and proposed action plan:

- Strengthening of research activities through the use of Biotechnology and Bioinformatics tools.
- To continue spreading awareness, knowledge sensitization by imparting hands-on trainings/ workshops in the areas of Biotechnology and Bioinformatics to the students from various Schools, Colleges, Universities.
- To organize national and international conferences, seminars and lecture series of eminent scientists to provide scientific platform to the students and teachers to have interface with recent trends Bioinformatics and Biotechnology.
- Fostering partnership, collaborative research, industry institute partnership and entrepreneurship development to achieve better research outputs leading to applied and product based science.

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