



**Volume I, August 2018**

**A newsletter of the Advanced Level Institutional Biotech Hub,  
Modern College, Imphal, Manipur**



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**Message**

Revolutions occur when different disciplines, fields, and ideas seamlessly merge into one unified stream. Biotechnology is a confluence of biology with engineering and other life, physical and social sciences especially microbiology, chemistry, material science, IT, computer science, economics, and folk medicine etc. This interdisciplinary subject can transform traditional biotech into modern biotech with potential to generate a cornucopia of products and processes useful to humankind.

Besides information technology (IT) and nanotechnology (NT), biotechnology (BT) holds tremendous potential to transform the NE in general and Manipur in particular from grant-in-aid states chronically dependent on the Centre's largesse into economically self-reliant region and states. NE India is one of 34 biodiversity hotspots in the world and is home to a rich diversity of floral and faunal biodiversity including several endemic medicinal plants and rare animal species. Moreover, there is a hidden wealth of microbial biodiversity which still remains largely unexplored. With intensive scientific research, these biodiversity resources may be sagaciously exploited with biotechnology tools to provide new antibiotics for drug-resistant pathogens, stress-tolerant crops with abiotic and biotic stress tolerance, probiotics for human health, biofuels as alternatives to toxic fossil fuels, and biofertilizers and biostimulants for 21st century agriculture.

I am happy to learn that Advanced Level Institutional Biotech Hub (AdL IBT Hub), Modern College, Imphal is going to publish the first issue of an online eBulletin. I am sure that the magazine would spare no efforts in assiduously collecting, compiling, and editing a useful journal to disseminate the latest advances in biotechnology among the students and teachers of Modern College and other colleges in Manipur and even the North East India. The bulletin would, one can hope, give a much needed fillip to biotech education and research in the colleges in Manipur in particular and NE in general. It would provide a platform for translating the rich bioresources of Manipur into beneficial biotech products while ensuring long-term conservation and sustainable development of the unique biodiversity of Manipur.

I congratulate the Coordinator, AdL IBT Hub, Modern College, and Principal, Modern college for their commendable initiative and wish the launching and sustained publication of the eJournal a grand success.

Canchipur  
September 3, 2018

Prof. Debananda S. Ningthoujam



### Principal's message

I am very happy to know that the Advanced Level Institutional Biotech Hub, Modern College Imphal is publishing the first volume of a newsletter "**Kanglei Sidahidak**", sponsored by the Department of Biotechnology, Government of India. The hub has been running since 2011-12 and was recently upgraded to Advanced Level because of the dedicated and endless effort of the competent, learned faculties and young scientists, under the overall supervision of the Co-ordinator, O. Premila Chanu. The hub carried out a number of outreach and training programs in Imphal and rural areas, in addition to strengthening the available equipment and other physical and scientific infrastructure. The Hub successfully organized a national seminar on "Challenges and perspectives of climate change and its impact on local bioresources (Flora and Fauna)" during 30-31<sup>st</sup> October 2015. In addition to publications in reputed journals and presentations in national and international conferences, the Hub is involved in disseminating scientific knowledge through radio talks. It is noteworthy to say that in spite of the many difficulties arising out of frequent flooding of the College campus, the entire Modern College community is proud of the hard work and achievements of the Hub during the last few years.

Dr. K. Biren Singh **Principal**  
Principal, **Modern College, Imphal**  
Modern College, Imphal



### From the Editor's desk

I am happy to present the first volume of the newsletter "**Kanglei Sidahidak**" published by the Advanced Level Biotech Hub, Modern College, Imphal sponsored by DBT, Govt. of India. This volume consists of the activities done by the Hub from July 2017 to June 2018. I am thankful to the Principal of our college, faculties of Zoology and Botany Departments and research team of Biotech Hub for their dedicated effort. We will be grateful for any suggestions for the improvement of the newsletter in subsequent volumes.

Dr. O. Premila Chanu  
Co-ordinator, Advanced Level  
Institutional Biotech Hub,  
Modern College, Imphal  
**Dr. O. Premila Chanu**  
Coordinator  
The Institutional Biotech Hub  
Modern College, Imphal

## **ABOUT THE COLLEGE**

Modern College, established on the 8th August 1963 and spreading over 15 acres of grassy green land is situated in the Imphal East District Head quarter of Manipur state. The College with a scenic beauty of hills in the background is located close to the District Police Head quarter, Deputy Commissioner Complex and Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Imphal. The college created history being the first college in Manipur to have been assessed and accredited by National Assessment and Accreditation Council (NAAC). The College was awarded B-Grade vide letter No.NAAC/A & A/outcome-194/2005, dated February 28, 2005. The College has also been re-accredited (second phase) by the NAAC in October, 2013 and awarded "B" grade.

## **ABOUT THE INSTITUTIONAL BIOTECH HUB**

The Institutional Biotech Hub at Modern College, Imphal was established on November 30, 2011 and upgraded to an Advanced Level Institutional Biotech Hub on December 1, 2017. Till now, this hub has published 15 research papers in international journals out of which 9 papers were published by utilizing the Hub facilities. With the objective to save our environment, we have started an annual activity from this year with the motto "Save our Environment" which involves planting tree saplings in our local area and spreading awareness for conservation of the environment.

## **IN THIS ISSUE**

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## ONGOING RESEARCH ACTIVITIES

- a. Investigation on the nephroprotective effect of *Oreopanax xalapensis* (local name: Chom)

Kidney disease is a global disease affecting both the developed and developing countries. In Manipur, the frequency of renal failure related ailments is increasing day by day. Every ethnic community in Manipur has well-established knowledge, skills, beliefs and practices relating to promotion of positive health and avoidance of sickness even before the hospital oriented system of medicine. WHO encourages the use of plant based medicines and recommends the scientific evaluation of similar plant extracts for discovery of potentially new drug molecules and bioactive principles. It is reported from some villages in Manipur (Nambol and Toubul) that there are evidences of recovering of patients with renal failure and advised for kidney transplantation by treating with the green leaves extract of one medicinal plant, Chom. In the present study, we are investigating the nephroprotective effects of *O. xalapensis* using phytochemical assays and cell line studies.

- b. Screening of phytochemicals and its hepatoprotective properties from selected plant species used in traditional herbal medicines

Liver plays a central role in detoxifying and transforming chemicals in the human body. Liver damage may lead to cirrhosis and ultimately to liver failure or primary liver cancer, which are irreversible conditions. As per the WHO estimates, about three quarters of the world's population currently use herbs and other traditional medicines to cure various diseases, including liver disorders. The medicinal plants are useful for healing as well as for curing of many human diseases because of the phytochemical constituents. Phytochemicals naturally occurred in the plants as secondary metabolites which possess strong antioxidant property, leading to anti-hepatotoxic activity. Studies on folk medicinal plants are of great advantage for producing herbal drug. *Melothria perpusilla* (Lam thabi), *Mimosa pudica* (Lam ekaithabi) and *Phlogacanthus jenkinsii* (Nongmakha asinba) were commonly used in the traditional healing system for treatment of liver ailments. Our investigation is to extract the phytochemicals from the above plants and analyse them for their medicinal properties.

- c. Potential antidiabetic activity from traditional medicinal plants (*Clerodendrum indicum*, *Curcuma amada* Roxb., *Scleria terrestris* and *Phyllanthus urinaria* Linn. )

According to the International Diabetes Federation, elevated blood glucose levels are the third uppermost risk factor for premature mortality. Some medicinal plants have been

reported to be useful in managing diabetes worldwide and are used as antidiabetic remedies. Antihyperglycemic effects of these plants are attributed to their ability to restore the function of pancreatic tissues by causing an increase in insulin output or inhibit the intestinal absorption of glucose or to the facilitation of metabolite in insulin dependent processes. It was also reported that new bioactive drugs isolated from plants showed antidiabetic activity with higher efficacy than oral hypoglycemic agents used in clinical therapy. Our objective is to investigate the antidiabetic potential of the selected plants by analyzing its phytochemical constituents.

d. Zebra fish as an experimental model for testing the efficacy of herbal drugs

Zebra fish is a major model organism for human biomedical research because its cellular processes are conserved throughout evolution including corresponding disease genes.

Reasons for choosing zebra fish as an animal model-

- ✓ Genetic similarity to human
- ✓ Easier to introduce genetic changes
- ✓ Lots of offspring
- ✓ Impact of any genetic mutation or drug treatment is easy to observe
- ✓ Easier to house and care

Because of the experimental accessibility and large numbers of offspring stemming from a single cross, zebra fish (*Danio rerio*), a freshwater tropical fish, provide an experimental capability to analyze mechanisms underlying disease states. Zebra fish are similar to humans in cellular composition, function, signaling, and response to injury as well as the cellular processes that mediate diseases. We are going to use fish as an experimental model for testing phytochemicals from locally available indigenous plants such as Chom, Lam thangjou, Charoiutong etc.

## ACTIVITIES OF THE BIOTECH HUB

### Training Programmes

S/No	Topic	Duration and Date	No. of participants	Level of participants
1	“The use of Binocular Microscope in the study of structure of cross section of stem of any plant in the School campus” organized by BLiss, C. C. Hr. Sec. School in collaboration with IBTHub, Modern College, sponsored by DBT, New Delhi.	4 Days , 16-19 August, 2017	40	IX <sup>th</sup> standard students of C. C. Hr. Sec. School, Imphal.
		4 days, 21-24 August, 2017	40	X <sup>th</sup> standard students of C. C. Hr. Sec. School, Imphal.
2	Workshop on “The use of Binocular Microscope in the preparation of squash for root tips of onion for study of Mitosis organized by BLiss, Ananda Singh Hr. Sec. School in collaboration with IBTHub, Modern College, Imphal, sponsored by DBT, New Delhi.	One day, 8 <sup>th</sup> September, 2017	40	IX <sup>th</sup> standard students of Ananda Singh Hr. Sec. School, Imphal
		One day, 9 <sup>th</sup> September, 2017	40	X <sup>th</sup> standard students of Ananda Singh Hr. Sec. School, Imphal
3	“The use of Spectrophotometer in chlorophyll extraction of medicinal plants” organized by BLiss, C. C. Hr. Sec School in collaboration with IBTHub, Modern College, Imphal sponsored by DBT, New Delhi.	4 Days , 11-14 September, 2017	40	XII <sup>th</sup> standard students of C. C. Hr. Sec. School, Imphal.
		4 Days , 16-19 September, 2017	40	XI <sup>th</sup> standard students of C. C. Hr. Sec. School, Imphal.
4	“The use of Spectrophotometer in chlorophyll extraction of medicinal plants” organized by BLiss, Ananda	4 Days , 22-25 September 2017	40	XII <sup>th</sup> standard students of Ananda Singh Hr.

	Singh Hr. Sec School in collaboration with IBTHub, Modern College, Imphal.	4 Days , 4-7 October 2017	40	Sec. School, Imphal. XI <sup>th</sup> standard students of Ananda Singh Hr. Sec. School, Imphal.
5	“Estimation of chlorophyll content in leaves of medicinal plants in the college campus” organized by IBTHub, Kakching Khunou in collaboration with IBTHub, Modern College, Imphal, sponsored by DBT, New Delhi	4 Days , 9-12 October 2017	40	V <sup>th</sup> Sem. Students of Kakching Khunou College, Umathel.
		4 days, 13-16 October 2017	40	V <sup>th</sup> Sem. Students of Kakching Khunou College, Umathel.
		4 days 23-26 October 2017	40	V <sup>th</sup> Sem. Students of Kakching Khunou College, Umathel.
6	“Mushroom cultivation” organized by IBTHub, Modern College, Imphal in collaboration with IBTHub, Kakching Khunou College, Umathel and Rama Foundation, RIMS Road, sponsored by DBT, New Delhi.	One day, 27 <sup>th</sup> March 2018	20	House Wives of Chingamakha Liwa Road, Imphal
		One day, 29 <sup>th</sup> March 2018	40	II <sup>nd</sup> , IV <sup>th</sup> and VI <sup>th</sup> Sem. B. Sc. Students of Modern College, Imphal
7	Biotechnology in Manipur” mentioning scope of Biotechnology to utilize the bioresources and also as a career option to minimize the problem of insurgency in Manipur	Recorded and forecasted on 24 <sup>th</sup> and 25 <sup>th</sup> Sept. 2013 at All India Radio, Imphal		Starting from 2013 it is forecasted at least four episodes every year and still continues

### Awareness Programmes

Sl No	Topic	Duration and Date	No. of participants
1	Science Day celebration on “Global Warming, Dooms Day Seed Vault and Strategies to fight at the Individual level on the motto-Think globally, Act locally” organized by IBT Hub, Modern College, Imphal, sponsored by DBT, New Delhi.	One day, 28 <sup>th</sup> Feb. 2018	42
2	One day awareness programme on current global topics organized by IBTHub, Modern College, Imphal in collaboration with Advanced Level IBTHub, G. P. Women’s College, Imphal, sponsored by DBT, New Delhi.	One day, 28 <sup>th</sup> March 2018	20

### Outreach Programmes

Sl No	Topic	Name of the institution where conducted	Duration and Date	Level of participants
1	Prospects and strategies of Biotechnology in the North East and Biotechnology as a career option after 10+2”	C. C. Hr. Sec. School, Imphal	One day, 2 <sup>nd</sup> August 2017	IX, X, XI and XII standard students (45 students)
		Ananda Singh Hr. Sec. School, Imphal	One day, 5 <sup>th</sup> Sep. 2017	IX, X, XI and XII standard students (40 students)
2	“Global Warming, Dooms Day Seed Vault and Strategies to fight at the Individual level on the motto-Think globally, Act locally”	Kakching Khunou College, Umathel	One day, 3 <sup>rd</sup> Oct. 2017	1 <sup>st</sup> , 3 <sup>rd</sup> and 5 <sup>th</sup> Sem. Students (25 students)

### Invited lectures at other institutions:

Sl. No.	Name of the resource person	Topic	Organised by	Duration & Date
1	Dr. O. Premila Chanu	Global Warming, Dooms Day Seed Vault and Strategies to fight at the	BLiss, C. C. Hr. Sec. School	One day, 10 <sup>th</sup> August 2017 (75 students)

		Individual level on the BLiss, Ananda One day, 4 <sup>th</sup> Sept. motto-Think globally, Act Singh Hr. Sec. 2017 locally School, Imphal (45 students)
2	Dr. O. Premila Chanu	Significance of secondary IBTHub, One day, 21 <sup>st</sup> Dec. metabolites in medicinal Kakching 2017 (30 students) plants Khunou College, Umathel

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## PUBLICATIONS

1. Sundari Devi, N., Kh. Singhajit Singh and Chanu O. P. 2017. Traditional vegetables with medicinal value from Loktak lake shore and threats to the community around. *International Journal of Current Research*, 9, (05), 50974-50978.
2. Chanu O. P., Maibam H. D. and Singh P. K. 2018. A review on the treatment of kidney failure (renal failure) with traditional herbal medicine as a new perspective. *International Journal of Scientific Research and Reviews*, 7(1), 535–54.
3. Devi Sundari N., Singh Kh. Singhajit and Oinam Premila Chanu. 2018. Water sensitive plant (*Neptunia Oleracea Lour.*): an income bio-resource as a significant cash crop in Manipur. *International Journal of Scientific Research and Reviews*, 7(1), 530–534.

## PAPERS PRESENTED

1. O. Premila Chanu. A review on the treatment of kidney failure (renal failure) with traditional herbal medicine as a new perspective. The International Conference on “Sustainable Development and North East India in the Globalized Era” held at Imphal during December 29-30, 2017
2. O. Premila Chanu. Conservation of local precious flora and fauna should be started from our homestead land. BIODIVERSE 2018 during January 27-29, 2018.
3. O. Premila Chanu. Existence of life on earth is threatened: Causes and strategies to fight International Conference on transforming leadership for global, social and environmental justice: issues and challenges held at Imphal during April 6-8, 2018.

## PHOTO GALLERY

### Observation of Science Day

28<sup>th</sup> February 2018



28<sup>th</sup> February 2018



### Mushroom cultivation training

27<sup>th</sup> March 2018



29<sup>th</sup> March 2018



### Outreach Program

28<sup>th</sup> March 2018



28<sup>th</sup> March 2018



### Videoconference program on Chemical Ecology

27<sup>th</sup> April 2018



27<sup>th</sup> April 2018

