

#### Editorial Board:

- *Dr. Nripen Goswami, Principal & Chairman, J.N.C, Boko*
- *Dr. Tapan Dutta, Co-ordinator, Biotech Hub, J.N.C, Boko*
- *Dr. Susanta Kumar Bhuyan, Co-coordinator, Biotech Hub, J.N.C, Boko*
- *Jayashree Goswami, JRF, Biotech Hub, J.N.C, Boko*

#### *From The Coordinator/Editor's Desk:*

Welcome to the First Issue of the "Biotech Live" – an annual newsletter of Institutional Biotech Hub of Jawaharlal Nehru College, Boko, Kamrup, Assam, published to showcase its facilities, annual activities, achievements & future plan of action. The Institutional Biotech Hub was established in the year 2011 under the financial assistance from Dept. of Biotechnology, Govt. of India, through NE Region Biotechnology Programme Management Cell (NER-BPMC) (New Delhi). Since its inception the Hub has been conducting Hands-On-Training, Workshops, Summer training, Outreach programme, Popular talk, Educational visits to enhance the skill of the students/teachers to handle advanced equipments as well as to create a scientific atmosphere in the rural and tribal area. It has also been supporting different students' projects and research activities of college as well as nearby Institutions.

In this issue of the newsletter we are trying to include all types of programmes including Hands-On-Training, Workshops, Lab Visit, Field visit, Outreach Programme, Popular Talk, Research activities etc conducted by the Hub since its inception and different instruments and other facilities available for students as well as faculty members.

I hope "Biotech Live" will be able to play a catalytic role to attract brilliant students towards Basic Science on a whole & Biotechnology in particular and be able to bring about a scientific movement in this rural and backward tribal area.

Regards,

**Dr. Tapan Dutta**

Associate Professor in Botany &  
Coordinator, Biotech Hub

## *Overview of the host college and the Biotech Hub:*

Jawaharlal Nehru College, Boko, is one of the pioneering rural institutions in the South Kamrup of Assam. It was established in the year 1964 with the aim of educating the deprived and poorest section of the society. **The Institutional Biotech Hub hosted by the college was sanctioned in the year 2010 by the department of Biotechnology, ministry of Science and Technology, Govt. of India which was implemented by North Eastern Region Biotechnology Programme Management Cell (NER-BPMC), New Delhi. It was formally inaugurated on 2<sup>nd</sup> May, 2011.** On the same day a “Biotech-Hub management committee” was constituted which included the Principal of the Institution, the coordinator and co-coordinator of the IBT hub and Heads of all the Science Departments of J.N. College, Boko. Meeting of the Management committee is held periodically since then for planning and monitoring of its activities to ensure smooth running of the Hub. Since then the Institutional Biotech Hub has been actively taking part in upgrading the level of scientific knowledge among the students, faculty members of the host institutions as well as nearby institutions.

## *Workshops/Training Programmes:*

Biotech Hub of J.N. College, Boko, is organising several workshops and/or Training Programmes on important scientific topics for the benefit of undergraduate students and faculty members/research scholars. During the years, from 1<sup>st</sup> April, 2011 to 31<sup>st</sup> March, 2015, the Institutional Biotech Hub organised **four training programmes, nine workshops, six outreach programmes and four educational trips.**

## *Hands-On-Trainings conducted:*

Four Hands-On-Training programmes have been conducted by the Biotech Hub for students, teachers and research scholars during the years 2011-2015.

A 3-day long Hands-On-Training programme was conducted for college teachers and research scholars from **30<sup>th</sup> June to 2<sup>nd</sup> July, 2011, on the topic “Short term training on Biological Instrumentation”.** The training was held to develop understanding the principles of operation of widely used biological instruments and practical sessions for acquiring skill for utilization of these instruments for carrying out biological research. A total of 19 trainees, who were Faculty members of neighbouring colleges from life science as well as physics, chemistry, maths departments and research scholars of life science disciplines from Gauhati University participated and successfully completed the training programme. Experts from Gauhati University and C.V. Sc, Guwahati imparted training through lecture and practical demonstration on uses & operation of instruments e.g. Electrophoresis, spectroscopy, soxhlet extraction, microscopy & micrometry. Prof Dr. A.K Handique from Dept. of Biotechnology,

Dr. Prabin Baruah from Dept. of Chemistry, GU, Prof Dr. Prabodh Borah, dept. microbiology, C. V. Sc, AAU Khanapara were the invited resource persons.

Another 3-day long training programme was conducted for High school teachers of the nearby schools from 27<sup>th</sup> to 29<sup>th</sup> September, 2011, on the topic “Capacity Building of Science Teachers’ at secondary level”. The workshop aimed at empowering the science teachers from neighbouring secondary schools through dissemination of knowledge on topics included in general science, especially biology and chemistry in Secondary school syllabus, and practical demonstrations, which will help in capacity building of the participating teachers for effective teaching of science. A total of seventeen Science teachers from neighbouring secondary schools and students from the host college participated in the workshop. Dr. Jogen Ch. Kalita, department of Zoology, GU was present as a key resource person on the first day of the workshop who presented topics on physiology of respiration, reproduction and nervous system aided by few demonstrations. On the second day of the workshop, Dr. Bhaben Tanti, resource person from the Dept. of Botany, GU, presented topics on Biological information, basics of cytology and genetics. Dr. Susanta Bhuyan, Mr. Habibur Rahman, Asstt. professors from J. N. College Boko also presented different topics on zoology & botany. On the third day various topics on chemistry was presented by Mr. Nuruddin Ahmed and Dr. A. K.

#### ✦ Research activities undertaken by the Biotech Hub:

- Study on certain aspects of reproduction in Muga silkworm.
- Screening of Phyto chemicals from Ethno medicinal plants.
- Study of nutritional values of lesser known vegetables

#### ✦ Papers published by the support of Biotech Hub:

- *Non conventional food plants used by different Ethnic groups of Assam: A case study in RabhaHasong Autonomous Council Area.* Dutta T and Rabha P.K.(2012): J. of Adv. PlantSciences.6(1 & 2):86 – 90.
- *Prospects and Challenges of Indoor Rearing of Muga Silk worm *Antheraea assamensis*: An overview.* Biswas D, Dutta T, Sahu S.K. and Kalita J.C (2013): In the Proceeding of the state level conference on Traditional Knowledge System for biodiversity Conservation in North Eastern Region of India., 2013, 92-110. (ISBN 978-81-925433-1-4.)
- *Ethnomedicine: Believe and conservation. A case study among Rabha Tribe of Assam.* Dutta T and Rabha P.K. Journal of Advanced Plant Sciences. (Accepted)
- *Mating behaviour of muga silk moth *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae) with a note on its mating strategy in different seasons.* Biswas B, Sahu, A.K., Kalita J.C. and Barpujari P: Indian Journal of Sericulture (Accepted).

#### ✦ Papers published by the support of Biotech Hub:

- Dutta T and Biswas D (2012): Diversity of soil fungi in natural vs. degraded Sal (*Shorea robusta*) ecosystem in Boko area” to be presented at the 57<sup>th</sup> Technical Session of Assam Science Society on 16<sup>th</sup> March 2012.
- Biswas, D., Sahu, A.K., Dutta, T., Kalita, J.C., Barpujari, P. and Rajkhowa, R. C. (2013). Courtship and mating behavior of muga silkworm *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae). Paper presented in the National Seminar on Frontiers of Science and Technology held at Gauhati University, Guwahati on 8th to 9<sup>th</sup> March, 2013.
- Biswas, D., Sahu, A.K., Dutta, T., Bhuyan, S.K. (2013). Morphological account of ovarian development in muga silkworm *Antheraea assamensis* Helfer (Lepidoptera: Saturniidae). Paper presented in the National Seminar

#### **✦ Instruments available in the Biotech Hub:**

- Vertical SLABGEL Electrophoresis apparatus, Model: GEL-02-02
- All glass Double Distillation Unit(Quartz Heater) Cat:3362-4.01, cap -4 ltr
- Analytical Electronic Balance(Min display 0.1mg)
- Vertical Laminar Air Flow Cabinet(work space 3'x2'x2') Model no: LV-22
- B.O.D Incubator, Model: LTI-4 (455x410x610 mm)
- Oven – Hot Air, Stain less steel chamber. Model:EL-02
- Autoclave Portable, Model: PASW-20
- Centrifuge Machine with digital display
- Tri-nocular Microscope with Digital Photo-micrographic attachment
- Magnetic Stirrer, Model: MS-2(SAD)
- Muffle Furnaces, Delux
- Microprocessor controlled Visible Spectrophotometer, Type-166
- Kjeldahl Distillation and Digestation combined Unit(Unit of 6 tests) Model: 151-C MKOW
- Digital P<sup>H</sup> Meter , Model: MK VI
- Hot Plate Round : Model: HPRS- 8
- Heating Mental (450 watt) Cap: 2 ltr
- Sterioscopic Binocular Microscope, Model: MS-TIL with light system
- Projection microscope
- Soxhlet Extraction Unit
- Soil Testing kit
- Fixed Volume Pipettes Two bottom operation Chemical resistant, 100,200, 1000 μL(Three nos,)
- Thermostate Controlled Water-bath
- Micro-centrifuge
- Submarine gel electrophoresis
- UV trans-illuminator
- All clear vaccumdessicator 8//
- Spinix vortex shaker
- Pipette accupipete, 0.2-20; 20-200 μL
- Microtome (Spencer type)
- Binocular Microscope
- OPTIMA Mixture Grinder MG2053E
- 10X50W Binoculars
- Mini Submarine Electrophoresis 7X7 cm
- Imaging System (Tri-nocular Microscope with digital camera)
- Visualizer/ Scanner(High resolution)
- Colorimeter

Goswami from Dept. Of Chemistry and Mr. Abani Das of Dept. of Geography spoke and demonstrated on GPS and its application from the host college.

A three-day long Hands-On-Training programme on **“Advanced Laboratory Equipments”** was arranged by the Institutional Biotech Hub **from 19<sup>th</sup> to 21<sup>st</sup> March, 2013**, for the undergraduate level students of the college to give them a firsthand knowledge on the correct methods of handling and operating various essential and sophisticated laboratory equipments.

A training programme was organised for the faculty members of the host college **from 15<sup>th</sup> to 17<sup>th</sup>, December, 2014, on the topic “Digital Teaching Methodology”** to popularise and train the faculties on the advanced method of teaching.

#### ***Workshops conducted:***

**On 18<sup>th</sup> March, 2013**, a workshop was organised by the Institutional Biotech Hub of the college, in collaboration with **“GULDASTA”**, Boko, **on the topic “Natural dyeing of Eri silk”** to educate the students and faculty members of the college on methods to dye eri silk using colours extracted from naturally available products. A total of about 103 undergraduate students attended the workshop.

A two-day workshop on **“Science through Experiential Learning for the students of Class X (Ten)”** was organised **from 20<sup>th</sup> – 21<sup>st</sup> March, 2014** in collaboration with

State Biotech Hub, Khanapara and EDUGENIE, Guwahati, a total of 75 students participated and benefited from this workshop.

**On 25<sup>th</sup> March, 2014**, a seminar was organised for UG level students and faculty members on the topic **“Declining culture population in Indian sub-continent”**, organised in collaboration with Dept. of Zoology, J.N. College, Boko.

Another one day seminar was organised by the Hub on **26<sup>th</sup> March, 2014**, on the topic **“Introduction to sets, relations and functions”**. The seminar was attended by UG level students and faculty members of the college.

A one day seminar was organised by the Hub in collaboration with Chemistry Dept. of the college on **28<sup>th</sup> March, 2014**, on the topic **“Symmetry and Point Group: Group theory and its Application”**, which was attended by about 40 UG level students and faculty members.

On the same day, i.e. **28<sup>th</sup> March, 2014**, another seminar was conducted in collaboration with Dept. of Physics, on the topic **“Structure of Matter-A New Approach”**, which was attended by 55 students and faculty members.

Another two day workshop on **“Tools and techniques on Biosciences”** was organised from **9<sup>th</sup> to 10<sup>th</sup> April, 2014**, for undergraduate students where about 45 students took part and learnt about various tools and techniques used in bioscience laboratories.

Starting from **25<sup>th</sup> to 26<sup>th</sup> March, 2015**, a two-day workshop, on the topic **“Science through Experiential Learning, Phase II”**, was organised by the Biotech Hub, in collaboration with EDUGENIE, at the college campus for the undergraduate students where about 50 students participated.

**On 28<sup>th</sup> March, 2015**, Biotech Hub along-with Department of Botany, J.N. College, Boko, organised a day long workshop on the topic **“Standard Operating Procedure (SOP) of laboratory techniques”** for the undergraduate Major students, where resource person invited from TERI, Guwahati, taught the students about the proper procedures for operating various basic and necessary laboratory techniques.

### ***Outreach programmes conducted:***

For spreading awareness about science and newly evolving job oriented scientific courses, especially Biotechnology, among students at secondary level and other rural people the Institutional Biotech Hub also organized six outreach programmes during the years 2011-2015.

**On 29<sup>th</sup> October, 2011**, a day-long outreach programme was organised by the Institutional Biotech Hub of the college at **Singra High School, Singra, Kamrup, Assam**, on the topic **“Popularization of Science/ Bio-science & Biotechnology (Phase I)”** for secondary level students. Dr. S.K. Bhuyan, Deptt. of Zoology, J.N. College, Boko discussed basics of cell biology and genetics in a popular way to attract the young minds and to make them appreciate it. Dipanjali Biswas, JRF of the Biotech-Hub discussed the lines of future

study and career prospects in bioscience and biotechnology. Demonstrations on different types of cells, chromosomes were done. The Coordinator of the Biotech-Hub, Dr. Tapan Dutta, appealed the teachers to motivate the students towards science. A competition on identification of locally available plants and birds was held among the secondary school students and the students who secured 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> position were rewarded to increase interest and awareness on biodiversity.

**On 5<sup>th</sup> April, 2013**, an outreach programme was organised by the Institutional Biotech Hub of the college at **Jatiya Bidyalaya, Ranjuli, Goalpara, for “Popularizing Science/ Bio-science & Biotechnology (Phase II)”** at secondary level.

Another outreach programme was organized at **Don Bosco High School, Boko, on 8<sup>th</sup> April, 2013**, for the same purpose of creating awareness about Science/ Bio-science & Biotechnology at secondary level.

The third phase of the outreach programme on the topic **“Popularization of Science/ Bio-science & Biotechnology (Phase III)”** for the secondary level students of **Boko High School, Boko**, was organised by the Biotech Hub on **18<sup>th</sup> March, 2014**.

Another outreach programme was organised on the topic **“World of Microbes” on 14<sup>th</sup> September, 2014, at Girls’ High School, Boko**, to aware them about different beneficial and pathogenic microbes found all around us.

An outreach programme was arranged by the Institutional Biotech Hub of the college at **Singra High School, Singra, on 30<sup>th</sup> March, 2015**, with the same motive of **“Popularizing Science/ Bio-science & Biotechnology (Phase IV)”** at secondary level.

### ***Educational Trip Conducted:***

The Institutional Biotech Hub of J.N. College, Boko, also arranges visit to other institutions to make the undergraduate student of the college acquainted with other advanced and sophisticated equipments. From 1<sup>st</sup> April, 2011 to 31<sup>st</sup> March, 2015, four institutional visits were arranged.

An exposure visit was arranged to **IASST, Guwahati, on 10<sup>th</sup> Jan, 2012**, for the undergraduate major students and faculty members to get them acquainted with advanced laboratory equipments available there.

Trip to **State Biotech Hub, Khanapara, Guwahati**, was arranged on **30<sup>th</sup> April, 2013**, for the undergraduate students. It was an educational trip with the motive of providing knowledge and first-hand information regarding the sophisticated laboratory equipments.

A one day educational trip was organized on **2<sup>nd</sup> May, 2013, to The Centre for Plasma Physics, Sonapur**, for the undergraduate students of the host institution.

Another trip to **the Tezpur University** was organized on **24<sup>th</sup> December, 2014**, where the undergraduate students of the college were provided with the opportunity to visit the Department of MBBT of the popular central university of the state.

## ***DBT Workshops Attended, funded by the Hub***

On 17<sup>th</sup> December, 2015 a two day workshop was organised by DBT at Guwahati on “Foldscope Microscope”, which was attended by three faculties from Dept. of Botany and Dept. of Physics with the help of the funding from Biotech Hub.

A three day workshop was organised at IISR, Pune, from 10<sup>th</sup> to 12<sup>th</sup> March, 2016, on the topic “Research Based Pedagogical Tools”. The workshop was attended by two faculty members from Botany and Mathematics Department which was sponsored by the Biotech Hub.

## ***Collaboration with other departments/institutions:***

Sl. No.	Dept./Institution collaborated	Nature of collaboration	Duration
1.	Department of Zoology, Gauhati University	Research advisory	5 years
2.	Biotech Hub, Pandu College	Technical support	For last two years
3.	Biotech Hub, B.P. Chaliha College, Nagarbera	Technical support and student exchange programme	For last three years

## ***Future activities and proposed action plan:***

- ❖ To initiate Under graduate research (Student project)
- ❖ To organize invited lectures by professors from universities/ advanced institutions.
- ❖ To organize more workshops and trainings on various important biotechnological processes.
- ❖ To develop a suitable and easy to learn practical manual to cover the biotechnology/ bioinformatics portion of the degree syllabus.
- ❖ To cover more secondary schools through outreach programmes.
- ❖ To organize exposure tour to advanced laboratories.
- ❖ To continue the ongoing research works and to publish the findings.

# *Few Snapshots*

## **Hands-On-Training Conducted**

### ❖ *“Biological Instrumentation”*



### ❖ *“Capacity Building of Science Teachers’ at secondary Level”*



### ❖ *“Advanced Laboratory Equipments”*





# Workshops Conducted

## ❖ “Science through Experiential Learning”



## ❖ “Natural dyeing of Eri silk”



## ❖ “Science through Experimental training, Phase II”



## ❖ “Standard Operating Procedure (SOP) of laboratory techniques”

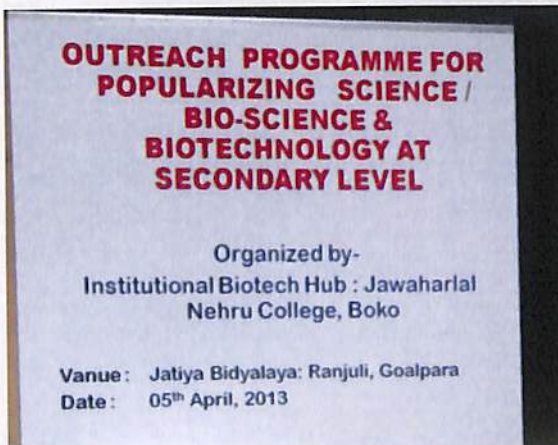


# Outreach Programmes Conducted

## ❖ At Singra High School, Singra



## ❖ At Jatiya Bidyalaya, Ranjuli, Goalpara



## ❖ At Don Bosco High School, Boko



## ***Educational Trips Conducted***

### ***❖ Trip to State Biotech Hub:***



### ***❖ Trip to Tezpur University:***



## ***DBT Workshops Attended, funded by the Hub***

### ***❖ Workshop on “Foldscope microscope”, at Guwahati***

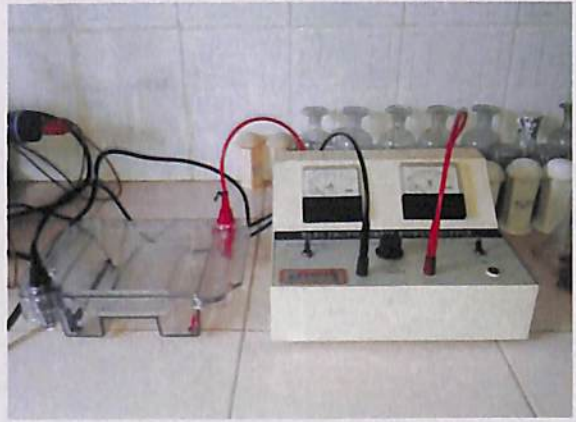
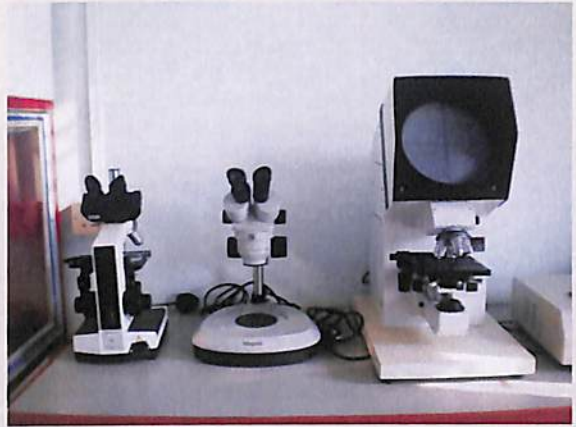


❖ *Workshop on “Research Based Padagogical Tools”, at IISR, Pune*



## ***Quick tour of the IBT Hub***





## *From The Principal's Desk*

*The biotech hub of our college, since its establishment in 2010, has been playing an important role in rendering science education to the backward tribal students by creating a well-equipped infrastructure for science stream thereby creating a scientific atmosphere in the institution and propagating interest for research among the faculty members and other researchers. It helps the students in terms of laboratory facilities, hands on training and exposure visit. It helps the faculty by providing facilities to conduct student projects and individual research work as well as skill development through providing in house short term training and provide financial assistance to attend in other institutes. It helps the nearby institutes through outreach programmes and providing technical as well as advisory support.*

*I on behalf of the college fraternity offer sincere gratitude to DBT government of India for undertaking such a fruitful project to facilitate skill development, teaching, research and create awareness in the field of Bioscience in general and Biotechnology in particular.*



(Dr. Nripen Goswami)  
Principal