BRIEF HISTORY OF DEPARTMENT

Date of Establishment: 3rd June, 2006

History

Biotechnology is an interdisciplinary course with application of biology in technology. In order to advert the need of having a professional course the Congregation of Christian Brothers in India had started the course in Biotechnology in St. Edmund’s College, Shillong. Initially the conceptual idea for erecting a professional subject like Biotechnology was first conceived by Bro. L.D. Lobo, ex-principal St. Edmund’s College Shillong and Prof. J. Sen, Department of Zoology St. Edmund’s College Shillong in the year 2005. Owing to their continuous effort and pertaining through the vernacular norms of the university the department existed into limelight in 2006. Bro. Miranda principal during that time took over all the duties and eventually started the department and inaugurated on 3rd June, 2006 which was inaugurated by Prof. Pramod Tandon, ex vice chancellor NEHU, Shillong. Prof. J.Sen was appointed the first Head of Department from 2006 onwards along with the appointment of another faculty Dr. Samrat Adhikari.

For their valuable contribution in the setting up of the Biotechnology Department in St. Edmund’s College, Shillong the College would like to thank the following dignitaries:

- Bro. E.V Miranda, c.f.c, Former Principal, St Edmund’s College, Shillong.
- Prof. Pramod Tandon, Former Vice Chancellor, NEHU, Shillong.
- Mr. J. Sen, Head (Former), St Edmund’s College Shillong.
- Prof. Anupam Chatterjee, Head, Deptt. Of Biotechnology & Bioinformatics, NEHU, Shillong.
- Dr. Santa Ram Joshi, Associate Professor, Deptt. Of Biotechnology & Bioinformatics, NEHU, Shillong.
- Ms. Martha Marwein, Director, College Development Council (CDC).
- Ms. Piyali Bhattacharjee, Assistant Professor, Deptt. Of Biochemistry, St. Edmund’s College Shillong

Presently the department is headed by Dr Samrat Adhikari under the auspicious chairmanship of our Principal Dr Sylvanus Lamare with four other staffs and two research students. The department has been pursuing very well and has been nominated by Department of Biotechnology, Govt. of India under its STAR college programme. Besides these the department has also Bioinformatics Infrastructure and Institutional Biotech Hub Facility (Funded by DBT, Govt. of India). The objective and mission of this department is to impart high quality education to
undergraduate students in the field of biotechnology so that they can prepare themselves to contribute as professionals to the fast growing industries such as fermentation technology, bioinformatics, genetic engineering, vaccine development, transgenic technology, diagnostic and therapeutic products, etc., in the country and beyond.
HEADS OF DEPARTMENT

Prof J. SEN
Former Head

**Educational Qualification**  
MSC (Zoology), NEHU

**Date of Joining**  
01-05-1971

**Date of Joining Headship**  
01.06.2006

**Date of Leaving**  
01-06-2010

SAMRAT ADHIKARI  
Present Head

**Educational Qualification**  
PhD [NEHU]
MSc [Bangalore University]
BITP [Mumbai]
NET

**Date of Joining**  
01.05.2006

**Date of Headship**  
01-06-2010

**Date of Leaving**  
Till Continuing
# FACULTY PROFILE

## BAIAKMENLANG MANNERS

**Educational Qualification**
- MSc [ALU, Coimbatore]

**Date of Joining**
- 01.05.2007

## GOPESH PAUL

**Educational Qualification**
- MSc [NEHU]
- PhD [NEHU]

**Date of Joining**
- 01.05.2010

## KOBEN NONGKYNRIH

**Educational Qualification**
- MSc [NEHU]
- NET

**Date of Joining**
- 01.05.2011

## SHEKINAH CHALLAM

**Educational Qualification**
- MSc [NEHU]NET, BET

**Date of Joining**
- 01.08.2013

## RESEARCH STUDENTS

### NANGKYNTIEWBOR JUNGAI

**Educational Qualification**
- MSc [NEHU]NET, BET

**Date of Joining**
- 01.08.2012

### BIKASH THAKURIA

**Educational Qualification**
- MSc [Bangalore University]

**Date of Joining**
- 01.05.2013

## LAB ATTENDANT

### ERWIN KHSHIAR

**Educational Qualification**
- 12th Pass

**Date of Joining**
- 01.06.2008
Programmes Organized By the Department

[2010-2015]

Workshops – National Level
## WORKSHOP ORGANIZED

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td>A workshop on “Bioinformatics – a computational approach to biological information”.</td>
</tr>
<tr>
<td><strong>Dates</strong></td>
<td>27th – 29th, July, 2010</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>3 Days</td>
</tr>
<tr>
<td><strong>Funding Agency</strong></td>
<td>Department of Biotechnology, Govt. of India</td>
</tr>
<tr>
<td><strong>Organizing Secretary</strong></td>
<td>Dr. Samrat Adhikari</td>
</tr>
<tr>
<td><strong>No of Participants</strong></td>
<td>22</td>
</tr>
</tbody>
</table>
| **Level of Participants** | Research Scholars from Tezpur University, Assam & NEHU, Shillong  
College Teachers from St Anthony's College, Shillong, UCC college, Umiam, SankerDev College, St. Edmund's College etc.  
School Teachers from various schools in Shillong |
| **Total No of Participants** | 18 |
| **Resource Persons** | Prof. B. K Konwar, Vice Chancellor, Nagaland University  
Prof. Sudip Kundu, University of Calcutta, West Bengal.  
Prof. A. K Singh, Deptt of Biochemistry, NEHU, Shillong  
Prof. Guru Subramaniam, Deptt of Biotechnology, Mizoram University. |
| **Nature of workshop** | National Level with hands on training in wet lab and also dry lab techniques. |

### 2012

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td>National Level workshop on “Basic Biotechnology techniques”</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>5 days</td>
</tr>
<tr>
<td><strong>Funding Agency</strong></td>
<td>Department of Biotechnology, Govt. of India</td>
</tr>
<tr>
<td><strong>Organizing Secretary</strong></td>
<td>Dr. Samrat Adhikari</td>
</tr>
<tr>
<td><strong>No of Participants</strong></td>
<td>22</td>
</tr>
</tbody>
</table>
| **Level of Participants** | Scientists from Sikkim State Council of Science and Technology, Govt. of Sikkim, Gangtok  
Research Scholars from North Bengal University, Siliguri, West Bengal  
Research Scholars from Gauhati University, Assam |
Department of Biotechnology

College teachers and Scientists from adjoining colleges and research institute in Shillong.

<table>
<thead>
<tr>
<th>Total No of Participants</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Persons</td>
<td>All faculty of Biotechnology Department.</td>
</tr>
<tr>
<td>Nature of workshop</td>
<td>Complete Hands on Training.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title</th>
<th>Bioinformatics for students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>4&lt;sup&gt;th&lt;/sup&gt; - 5&lt;sup&gt;th&lt;/sup&gt; October, 2012</td>
</tr>
<tr>
<td>Duration</td>
<td>2 days</td>
</tr>
<tr>
<td>Funding Agency</td>
<td>Department of Biotechnology, Govt. of India</td>
</tr>
<tr>
<td>Organizing Secretary</td>
<td>Dr Samrat Adhikari</td>
</tr>
<tr>
<td>No of Participants</td>
<td>30</td>
</tr>
<tr>
<td>Level of Participants</td>
<td>Students of Biotechnology honours were given training on basic bioinformatics tools.</td>
</tr>
<tr>
<td>Resource Persons</td>
<td>All faculty of Biotechnology Department</td>
</tr>
<tr>
<td>Nature of workshop</td>
<td>Hands on session on Bioinformatics tools</td>
</tr>
</tbody>
</table>

2014

<table>
<thead>
<tr>
<th>Title</th>
<th>National Level workshop on “Hand on Training on Basic Techniques in Genomics &amp; Proteomics”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>17&lt;sup&gt;th&lt;/sup&gt; – 21&lt;sup&gt;st&lt;/sup&gt; November, 2014</td>
</tr>
<tr>
<td>Duration</td>
<td>5 Days</td>
</tr>
<tr>
<td>Funding Agency</td>
<td>Department of Biotechnology, Govt. of India</td>
</tr>
<tr>
<td>Organizing Secretary</td>
<td>Dr Samrat Adhikari</td>
</tr>
<tr>
<td>No of Participants</td>
<td>22</td>
</tr>
<tr>
<td>Level of Participants</td>
<td>Research Scholars from GTB Hospital, University of Delhi, New Delhi</td>
</tr>
<tr>
<td></td>
<td>Faculty from other Colleges of Shillong</td>
</tr>
<tr>
<td></td>
<td>Research Scholars from Rajiv Gandhi University, Itanagar, AP</td>
</tr>
<tr>
<td></td>
<td>Research Scholars from Silchar, Assam</td>
</tr>
<tr>
<td>Resource Persons</td>
<td>Prof M. A Lashkar, Department of Biotechnology, St. Anthony’s College, Shillong</td>
</tr>
<tr>
<td></td>
<td>Dr Partha Sarathi Das, Bioinformatics centre, Vidyasagar University, West Bengal</td>
</tr>
<tr>
<td></td>
<td>Dr Vipin Tyagi, Department of Physiology, UCMS, New Delhi</td>
</tr>
<tr>
<td></td>
<td>Dr Pravin Deyshmukh, Department of Physiology, UCMS, New Delhi</td>
</tr>
<tr>
<td></td>
<td>Dr Piyali Bhattacharjee, Department of Biochemistry, St. Edmund’s College</td>
</tr>
<tr>
<td>Nature of workshop</td>
<td>Complete Hands on Training.</td>
</tr>
</tbody>
</table>

Department Profile 2010-2015
Programmes Organized By the Department

[2010-2015]

Faculty Improvement Programme
Faculty Improvement Programme

Year: 2014

Organizing Secretary: Dr Samrat Adhikari, Member Secretary, STAR SCHEME, St. Edmund's College

Title: Faculty Improvement Programme

Duration: 1 Day

Dates: 17th October, 2014

Mode of Presentation: Power point and one to one interaction

Theme of Programme: Effective project Proposal writing

Resource Person: Prof BasuDev Banerjee
Department of Biochemistry
University College of Medical Sciences & GTB Hospital
New Delhi
Teaching Faculty

Level of Participants: Teaching Faculty

Details of Participants:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Institute</th>
<th>Department</th>
<th>No of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NEIGRIHMS, Shillong</td>
<td>Pathology</td>
<td>02</td>
</tr>
<tr>
<td>2</td>
<td>NEIGRIHMS, Shillong</td>
<td>Oncology</td>
<td>02</td>
</tr>
<tr>
<td>3</td>
<td>NEIGRIHMS, Shillong</td>
<td>Surgery</td>
<td>02</td>
</tr>
<tr>
<td>4</td>
<td>NEIGRIHMS, Shillong</td>
<td>Microbiology</td>
<td>02</td>
</tr>
<tr>
<td>5</td>
<td>St. Edmund's College</td>
<td>Physics</td>
<td>02</td>
</tr>
<tr>
<td>6</td>
<td>St. Edmund's College</td>
<td>Biochemistry</td>
<td>03</td>
</tr>
<tr>
<td>7</td>
<td>St. Edmund's College</td>
<td>Electronics</td>
<td>02</td>
</tr>
<tr>
<td>8</td>
<td>St. Edmund's College</td>
<td>Environmental Science</td>
<td>02</td>
</tr>
<tr>
<td>9</td>
<td>St. Edmund's College</td>
<td>Chemistry</td>
<td>01</td>
</tr>
<tr>
<td>10</td>
<td>St. Edmund's College</td>
<td>Mathematics</td>
<td>02</td>
</tr>
<tr>
<td>11</td>
<td>St. Edmund's College</td>
<td>Biotechnology</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>22</td>
</tr>
</tbody>
</table>

Feedback:
Excellent: 03  Good: 12  Average: 07  Satisfactory: NIL
Programmes Organized By the Department

[2010-2015]
NATIONAL SEMINARS ORGANIZED

Activity: Inter College Research Seminar

Year: 2010

Organizing Department: Biotechnology

Topic: “Minor Research in Biological Sciences”

Duration: 1 day

Dates: 2nd December, 2010

Objective of the Programme: This programme is designed for providing a basic platform for the Students of biological science at undergraduate level to present both oral & poster presentation of the research work that they have pursued during the STAR College practical's

Name of the Judges: Research students from NEHU, Shillong

No of participants: 30 (Presenters) * 90 Participants

Students from reputed colleges of Shillong

Details of Participants

<table>
<thead>
<tr>
<th>College</th>
<th>Stream</th>
<th>Participants [Oral &amp; Posters]</th>
<th>Participants [attending]</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Edmund's College, Shillong</td>
<td>Biotechnology</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>St. Anthony's College, Shillong</td>
<td>Biotechnology</td>
<td>08</td>
<td>10</td>
</tr>
<tr>
<td>RCHE, Shillong</td>
<td>Biotechnology</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>St. Mary' College, Shillong</td>
<td>Botany, Zoology</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Lady's Keane College, Shillong</td>
<td>Biochemistry</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Shillong College, Shillong</td>
<td>Microbiology</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>30</strong></td>
<td><strong>90</strong></td>
<td></td>
</tr>
</tbody>
</table>

Feedback: Excellent: 35  Good: 45  Average: 10  Satisfactory: NIL
Department of Biotechnology

**Activity**  
Inter College Research Seminar  

**Year**  
2011

**Organizing Department**  
Biotechnology

**Topic**  
“Minor Research in Biological Sciences”

**Duration:**
1 day

**Dates:**
2nd December, 2011

**Objective of the Programme**
This programme is designed for providing a basic platform for the Students of biological science at undergraduate level to present both oral & poster presentation of the research work that they have pursued during the STAR College practical’s

**Name of the Judges**
Faculty from nearby colleges

**No of participants**
35 (Presenters) * 96 Participants

Students from reputed colleges of Shillong

**Details of Participants**

<table>
<thead>
<tr>
<th>College</th>
<th>Stream</th>
<th>Participants [Oral &amp; Posters]</th>
<th>Participants [attending]</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Edmund’s College, Shillong</td>
<td>Biotechnology</td>
<td>12</td>
<td>10</td>
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<tr>
<td>St. Anthony’s College, Shillong</td>
<td>Biotechnology</td>
<td>08</td>
<td>10</td>
</tr>
<tr>
<td>RCHE, Shillong</td>
<td>Biotechnology</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>St. Mary’ College, Shillong</td>
<td>Botany, Zoology</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Lady’s Keane College, Shillong</td>
<td>Biochemistry</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Shillong College, Shillong</td>
<td>Microbiology</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>33</strong></td>
<td><strong>96</strong></td>
</tr>
</tbody>
</table>

**Feedback**
Excellent: 40   Good: 45   Average: 16   Satisfactory: NIL
Programmes Organized By the Department [2010-2015]

Guest Lectures
GUEST LECTURES

2010

Topic: "HUMAN GENOME PROJECT"
Duration & Dates: 1 Day, 4th September, 2010
Resource Persons: Prof Anupam Chatterjee, Molecular Genetics Lab, Deptt. of Biotechnology & Bioinformatics, NEHU, Shillong
Level of participants: 45 (Degree)
Participants Details:

<table>
<thead>
<tr>
<th>Department</th>
<th>Year</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td>III</td>
<td>05</td>
</tr>
<tr>
<td>Zoology</td>
<td>III</td>
<td>07</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>III</td>
<td>10</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>III</td>
<td>23</td>
</tr>
<tr>
<td>TOTAL</td>
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</tbody>
</table>

Topic: Plant Biotechnology and its applications
Duration & Dates: 1 Day, 25th October, 2010
Resource Persons: Prof Suman Kumaria, Plant Biotechnology Division, NEHU, Shillong
Level of participants: UG students from constituent departments
Participants Details:

<table>
<thead>
<tr>
<th>Department</th>
<th>Year</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
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<td>Biotechnology</td>
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<tr>
<td>TOTAL</td>
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</tr>
</tbody>
</table>

2011

Topic: "Emerging role of Food Biotechnology"
Duration & Dates: 1 Day, 28th May, 2011
Resource Persons: Dr Saikat Dutta Mazumdar, CEO, NutriPlus Knowledge Centre, ICRISAT.
Level of participants: UG students from constituent departments
Participants Details:

<table>
<thead>
<tr>
<th>Department</th>
<th>Year</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
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<tr>
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<td>Biochemistry</td>
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</table>
**Department of Biotechnology**

<table>
<thead>
<tr>
<th>Department</th>
<th>Year</th>
<th>No. of Students</th>
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</thead>
<tbody>
<tr>
<td>Biotechnology</td>
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<td>15</td>
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<tr>
<td>Chemistry</td>
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<tr>
<td><strong>TOTAL</strong></td>
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</tbody>
</table>

**Topic:** A lecture on Fundamentals of Bioinformatics  
**Duration & Dates:** 1 Day, 7th June, 2011  
**Resource Persons:** Ms. P. Priyadarshini, Research Fellow, Auckland University, New Zealand.  
**Level of participants:** UG students from constituent departments

**Participants Details:**

<table>
<thead>
<tr>
<th>Department</th>
<th>Year</th>
<th>No. of Students</th>
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<tr>
<td><strong>TOTAL</strong></td>
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</tr>
</tbody>
</table>

**2011**  
**Topic:** “Marine Biotechnology in India: Perspectives and prospects”  
**Duration & Dates:** 1 Day, 7th August, 2011  
**Resource Persons:** Mr. Borve D. A. Kharsyntiew, Scholar, SRM University, Chennai, India  
**Level of participants:** UG students from constituent departments

**Participants Details:**

<table>
<thead>
<tr>
<th>Department</th>
<th>Year</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td><strong>TOTAL</strong></td>
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<td><strong>34</strong></td>
</tr>
</tbody>
</table>
2013

Topic: Plant Biotechnology in India
Duration & Dates: 1 Day, 6th September, 2013
Resource Persons: Prof. S. R Rao, Department of Biotechnology & Bioinformatics, NEHU, Shillong
Level of participants: UG students from constituent departments
Participants Details:

<table>
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<th>Department</th>
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<td>Total</td>
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2014

Topic: Plant Biotechnology – Tools & Techniques
Duration & Dates: 1 Day, 25th July 2014
Resource Persons: Prof. Pratap Jyoti Handique, Dept. of Biotechnology, Guwahati University, Guwahati.
Level of participants: UG students from constituent departments
Participants Details:

<table>
<thead>
<tr>
<th>Department</th>
<th>Year</th>
<th>No. of Students</th>
</tr>
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<tr>
<td>Zoology</td>
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</tbody>
</table>

2014

Topic: Genetic engineering- tools & techniques
Duration & Dates: 1 Day, 18th October, 2014
Resource Persons: Dr Tusha Sharma, Department of Biochemistry, University College of Medical Sciences & GTB Hospital, New Delhi
Level of participants: UG students from constituent departments
Participants Details:

<table>
<thead>
<tr>
<th>Department</th>
<th>Year</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
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<td>Zoology</td>
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<td>12</td>
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<td>III</td>
<td>18</td>
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<tr>
<td>Teachers</td>
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### 2014

#### Topic:
**Accessing Scholarly Web Resources**

#### Duration & Dates:
1 Day, 24th October, 2014

#### Resource Persons:
Dr. Lalmacchhuana, Documentation Officer, NEHU Central Library, Shillong.

#### Level of participants:
UG students from constituent departments

#### Participants Details:

<table>
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TOTAL 1079

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### 2015

#### Topic:
**Accessing Scholarly Web Resources**

#### Duration & Dates:
1 Day, 23rd May, 2015

#### Resource Persons:
Dr. Lalmacchhuana, Documentation Officer, NEHU Central Library, Shillong.

#### Level of participants:
UG students from constituent departments

#### Participants Details:

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#### Topic:
**Use of Graphics display tool in Bioinformatics**

#### Duration & Dates:
1 Day, 19th August, 2015

#### Resource Persons:
Mr Bikash Thakuria  
Research Associate  
Bioinformatics Centre, St. Edmund’s College, Shillong

#### Level of participants:
UG students from constituent departments
### Participants Details:

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Programmes Organized By the Department

[2010-2015]

Popular Lectures
POPULAR LECTURE

2014

Topic:
A Wandering Scientist / Do Science and See the World

Duration & Dates:
1 Day, 12th August, 2014

Resource Persons:
Prof S. V Eswaran
Emeritus Scientist, CSIR, New Delhi
Distinguished Faculty, St. Stephen's College, New Delhi

Level of participants:
UG students from constituent departments

Participants Details:

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Title
Excitement in Science- It Pays Too

Duration
1 Day

Dates
11th August, 2014

Mode of Presentation
Power point and one to one interaction

Resource Person
Prof S. V Eswaran
Emeritus Scientist, CSIR, New Delhi
Distinguished Faculty, St. Stephen's College, New Delhi

Level of Participants
Higher Secondary School Students.
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**Feedback**

Excellent: 225  
Good: 73  
Average:  
Satisfactory: NIL
Programmes Organized By the Department

[2010-2015]

Interactive Sessions
Interactive Sessions

Year: 2010
Duration: 3 hrs
Dates: 11<sup>th</sup> March, 2010

Theme of Programme: Faculty interaction
Invited Person: Prof Micheal Kuesgen
Dean, Faculty of Pharmacy
Phillip University, Marburg, Germany

Level of Participants: Teaching Faculty

Details of Participants

<table>
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<th>No of Participants</th>
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Feedback:
Excellent: 03
Good: 12
Average: 07
Satisfactory: NIL

Year: 2013
Duration: 3 hrs
Dates: 18<sup>th</sup> March, 2013

Theme of Programme: Faculty interaction
Invited Person: Prof S. Sikhamany
Former Vice Chancellor
Academic Staff College, Hyderabad

Level of Participants: Teaching Faculty

Details of Participants

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Department of Biotechnology

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<tr>
<td>Invited Person</td>
<td>Prof. S. V. Eswaran, Emeritus Scientist, CSIR, New Delhi</td>
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Distinguished Faculty, St. Stephen's College, New Delhi

#### Level of Participants
Teaching Faculty

#### Details of Participants

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Feedback
Excellent: 02  Good: 18  Average: 02  Satisfactory: NIL

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<td>Dr. T. Madhan Mohan, Advisor</td>
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Department of Biotechnology
Govt. of India, New Delhi
### Level of Participants

#### Details of Participants

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**Total** 20

#### Feedback

- Excellent: 15
- Good: 05
- Average: 0
- Satisfactory: NIL

#### Duration

3 hrs

#### Dates

28th October, 2014

#### Theme of Programme

Student Interaction

#### Invited Person

Prof. Ashish Mukherjee

#### Department

Department of Molecular Biology & Biotechnology

Tezpur University, Tezpur, Assam

---

### Level of Participants

#### Details of Participants

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**Total** 68

#### Feedback

- Excellent: 19
- Good: 31
- Average: 16
- Satisfactory: 02
Programmes Organized By the Department

[2010-2015]

Awareness Programmes
### AWARENESS PROGRAMME

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<td>Dates</td>
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<td>24th May, 2014</td>
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<td>Resource Person</td>
<td>Dr Samrat Adhikari, Department of Biotechnology, St. Edmund’s Shillong, Dr D. Syiemiong, Department of Botany, St. Edmund’s Shillong, Prof S. Choudhury, Department of Chemistry, St. Edmund’s Shillong</td>
<td>Dr Gopesh Paul, Department of Biotechnology, St. Edmund’s Shillong, Dr S. Goswami, Department of Botany, St. Edmund’s Shillong, Prof Sumit Deb, Department of Chemistry, St. Edmund’s Shillong</td>
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<tr>
<td>School</td>
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<td>Duration</td>
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<td>Class XII</td>
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<tr>
<td>Dates</td>
<td>28\textsuperscript{th} June, 2014</td>
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</table>
| Resource Person | Dr Gopesh Paul, Department of Biotechnology, St. Edmund's Shillong  
Dr S. Goswami, Department of Botany, St. Edmund's Shillong  
Prof Sumit Deb, Department of Chemistry, St. Edmund's Shillong |
| School | GorkhaPathala Higher Secondary School, Shillong |
| Area | Town |
| Duration | 1 Day |
| Level of Participants | Class XII |
| Mode of Presentation | Presentations & Demonstration |
| No. of Participants | 32 |
| Feedback | Excellent: 09  Good: 11  Average: 12  Satisfactory: NIL |

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| Resource Person | Prof S. Challam, Department of Biotechnology, St. Edmund's Shillong  
Prof D. Syiemiong, Department of Botany, St. Edmund's Shillong  
Dr D. Rangad, Department of Zoology, St. Edmund's Shillong |
| School | Sacred Heart Boys H.S School, Shillong |
| Area | Town |
| Duration | 1 Day |
| Level of Participants | Class XII |
| Mode of Presentation | Presentations & Demonstration |
| No. of Participants | 35 |
| Feedback | Excellent: 10  Good: 12  Average: 08  Satisfactory: NIL |
| Title | Capacity building, awareness, sensitization on Biotechnology for Higher Secondary School students |
| Dates | 30th August, 2014 |
| Resource Person | Mr Nangkyntiew Jungai, Department of Biotechnology, St. Edmund’s Shillong  
Dr S. Goswami, Department of Botany, St. Edmund’s Shillong  
Dr Ayon Bhattacharjee, National Institute of Technology, Shillong |
| School | Army Public School, Shillong |
| Area | Town |
| Duration | 1 Day |
| Level of Participants | Class XII |
| Mode of Presentation | Presentations & Demonstration |
| No. of Participants | 29 |

**Feedback**

- Excellent: 12
- Good: 11
- Average: 06
- Satisfactory: NIL

| Title | Capacity building, awareness, sensitization on Biotechnology for Higher Secondary School students |
| Dates | 27th September, 2014 |
| Resource Person | Prof K. Nongkynrih, Department of Biotechnology, St. Edmund’s Shillong  
Dr R. Das, Department of Physics, St. Edmund’s Shillong  
Prof S. Choudhury, Department of Biochemistry, St. Edmund’s Shillong |
| School | Laban Bengali H.S School, Shillong |
| Area | Town |
| Duration | 1 Day |
| Level of Participants | Class XII |
| Mode of Presentation | Presentations & Demonstration |
| No. of Participants | 36 |

**Feedback**

- Excellent: 12
- Good: 20
- Average: 04
- Satisfactory: NIL

| Title | Capacity building, awareness, sensitization on Biotechnology for Higher Secondary School students |
| Dates | 25th October, 2014 |
| Resource Person | Prof. B. Manners, Department of Biotechnology, St. Edmund's Shillong  
Dr. P. Bhattacharjee, Department of Biochemistry, St. Edmund's Shillong  
Dr. Viki Manners, Department of Botany, Shillong |
| School | Seven set H.S Schools, Shillong |
| Area | Town |
Department of Biotechnology

Title
Capacity building, awareness, sensitization on Biotechnology for Higher Secondary School students

Dates
27th September, 2014

Resource Person
Prof K. Nongkynrih, Department of Biotechnology, St. Edmund’s Shillong
Dr. R. Das, Department of Physics, St. Edmund’s Shillong
Prof S. Choudhury, Department of Biochemistry, St. Edmund’s Shillong

School
Laban Bengali H.S School, Shillong

Area
Town

Duration
1 Day

Level of Participants
Class XII

Mode of Presentation
Presentations & Demonstration

No. of Participants
41

Feedback
Excellent: 19 Good: 21 Average: 01 Satisfactory: NIL

---

2015

Objective
Capacity building, awareness, sensitization on Biotechnology for Higher Secondary School students

Dates
18th August, 2015

Resource Person
Prof K. Nongkynrih, Department of Biotechnology, St. Edmund’s Shillong
Prof S. Choudhury, Department of Chemistry, St. Edmund’s Shillong

School
Army Public School, Shillong

Area
Town

Duration
1 Day

Level of Participants
Class XII

Feedback
Excellent: 12 Good: 20 Average: 04 Satisfactory: NIL
### Mode of Presentation
- Presentations & Demonstration

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</tr>
</tbody>
</table>

### Feedback
- Excellent: 12
- Good: 20
- Average: 4
- Satisfactory: NIL

<table>
<thead>
<tr>
<th>Title</th>
<th>Capacity building, awareness, sensitization on Biotechnology for Higher Secondary School students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>19th September, 2015</td>
</tr>
<tr>
<td>Resource Person</td>
<td>Prof S Challam, Department of Biotechnology, St. Edmund’s Shillong</td>
</tr>
<tr>
<td></td>
<td>DR S. Goswami, Department of Botany, St. Edmund’s Shillong</td>
</tr>
<tr>
<td>School</td>
<td>St. Margaret School, Shillong</td>
</tr>
<tr>
<td>Area</td>
<td>Town</td>
</tr>
<tr>
<td>Duration</td>
<td>1 Day</td>
</tr>
<tr>
<td>Level of Participants</td>
<td>Class XII</td>
</tr>
<tr>
<td>Mode of Presentation</td>
<td>Presentations &amp; Demonstration</td>
</tr>
<tr>
<td>No. of Participants</td>
<td>32</td>
</tr>
</tbody>
</table>

| Feedback | Excellent: 12 | Good: 20 | Average: 4 | Satisfactory: NIL |
Programmes Organized By the Department

[2010-2015]

Resources Developed
RESOURCES DEVELOPED

Module Developed: Virtual Laboratory
Developed by: MrBikashThakuria
Research Associate, Bioinformatics Centre, St. Edmund's College, Shillong

Collaborator: Mr Nangkyntiew Jungai
Senior Research Fellow, Institutional Biotech Hub, St. Edmund's College, Shillong

Mode of operation: Both online & offline
Methodology: Free wares & online databases
Techniques Developed: Estimation of Protein by Lowry's Method

Module Developed: Laboratory Manuals
Details: Laboratory manual for undergraduate students of Biotechnology
Availability: Print only (Free for students)
Developed by: Mr Nangkyntiew Jungai
Senior Research Fellow, Institutional Biotech Hub, St. Edmund's College, Shillong

Collaborator: MrBikashThakuria
Research Associate, Bioinformatics Centre, St. Edmund's College, Shillong

Module Developed: SOP’s
Developed by: Faculty of Biotechnology Department
Collaborator: Bioinformatics Centre & Biotech Hub, St. Edmund's College, Shillong

Details: Fluorescence Microscope, Electrophoresis apparatus, Gel Documentation system, Microbiology Culture facility, Plant tissue culture facility,
Cyanobacterial repository facility, Lyophilizer, Balance, Millipore distillation unit, Bacteriological Incubator BOD incubator, Spectrophotometer Calorimeter, Handling of Ethidium Bromide, Handling of microbiology waste Ultrasonicator, General Microscope, Ice machine, -20°C refrigerator.

<table>
<thead>
<tr>
<th>Module Developed</th>
<th>E-Books Repository Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Details</td>
<td>Contains a collection of 314 e-books in biosciences for students</td>
</tr>
<tr>
<td>Availability</td>
<td>Free and only in Bioinformatics centre</td>
</tr>
<tr>
<td>Developed by</td>
<td>MrBikashThakuria</td>
</tr>
<tr>
<td></td>
<td>Research Associate, Bioinformatics Centre, St. Edmund's College Shillong</td>
</tr>
<tr>
<td>Collaborator</td>
<td>NIL</td>
</tr>
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</table>
Programmes Organized By the Department

[2010-2015]

Educational Trips Conducted
## EDUCATIONAL TOUR CONDUCTED BY THE DEPARTMENT

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Year</th>
<th>Place of Visits</th>
<th>Instituted visited</th>
<th>Industries visits</th>
<th>Other attractions</th>
<th>Fund Source</th>
<th>No of students</th>
<th>No of Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2010</td>
<td>Hyderabad, Andra Pradesh</td>
<td>ICRISAT, Tarnaka Osmania University, Secunderabad IICT, Uppal Road Central University of Hyderabad</td>
<td>NIL</td>
<td>Ramoji Film City\ Lumbini Gardens</td>
<td>STAR</td>
<td>35</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>2011</td>
<td>Kolkata, West Bengal</td>
<td>IICB, Jadavpur NIRJAF, Tollygunge Bose Institute</td>
<td>NIL</td>
<td>Science City Nicco Park Local tour</td>
<td>STAR</td>
<td>38</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>2012</td>
<td>Jorhat, Assam</td>
<td>NEIST, Tarajan AAU Campus Sericulture Institute TOCKLAI, Cinnamara</td>
<td>NIL</td>
<td>Local site tour</td>
<td>STAR</td>
<td>34</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>2013</td>
<td>Hyderabad, Andra Pradesh</td>
<td>Central University of Hyderabad National Institute of Nutrition IICT, Hyderabad SanthaBiotechnic Ltd Reddy’s Laboratory GVK Bioscines</td>
<td>NIL</td>
<td>Ramoji Film City Snow World Lumbini Gardens Zoological Park Local Tour</td>
<td>College</td>
<td>45</td>
<td>6</td>
</tr>
<tr>
<td>Year</td>
<td>Year</td>
<td>Location</td>
<td>Institutions</td>
<td>Activities</td>
<td>STAR</td>
<td>Score</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>2014</td>
<td>Kolkata, West Bengal</td>
<td>IICB, Jadavpur IACS, Jadavpur Jadavpur University</td>
<td>Dey's Medical Wax Museum Eco Park Zooligical Garden Science City</td>
<td>54</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2015</td>
<td>Bangalore, Karnataka</td>
<td>IISC, Bangalore IBAB, Bangalore AMC College, Bangalore ACRI, Bangalore</td>
<td>Biocon India Ltd Wonderla, Bangalore Mysore Palace, Mysore Brindavan Gardens, Mysore Botanical Garden</td>
<td>60</td>
<td>4</td>
<td></td>
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</tbody>
</table>
Academic Activities

[2010-2015]

Students Intake
STUDENTS INTAKE

2010

No of Sanctioned seats 30
No. of Applications 350
No of students admitted 56
No. of Students appeared in Examination 20

2011

No of Sanctioned seats 40
No. of Applications 421
No of students admitted 46
No. of Students appeared in Examination 22

2012

No of Sanctioned seats 40
No. of Applications 552
No of students admitted 62
No. of Students appeared in Examination 15

2013

No of Sanctioned seats 40
No. of Applications 556
No of students admitted 54
No. of Students appeared in Examination 23

2014

No of Sanctioned seats 40
No. of Applications 689
No of students admitted 60
No. of Students appeared in Examination 13

2015

No of Sanctioned seats 50
No. of Applications 774
No of students admitted 55
No. of Students appeared in Examination 29
Academic Activities

[2010-2015]

Results
RESULTS

2010

No. of Students appeared in Examination 20
   No. of First Class 20
   No of Second class NIL
   Pass Percentage 100 %
   Positions 02

Name of Students     Rank
   PaiaShadap         7th
   UpasanaChetry      8th

2011

No. of Students appeared in Examination 22
   No. of First Class 21
   No of Second class 01
   Pass Percentage 100 %
   Positions 02

Name of Students     Rank
   Poonam Sharma     6th
   BanrapMawklieng   8th

2012

No. of Students appeared in Examination 15
   No. of First Class 14
   No of Second class 01
   Pass Percentage 100 %
   Positions 03

Name of Students     Rank
   Alicia BamonSyiem 1st
   John Paul Swer    3rd
   Samantha B Nongbri 4th
### 2013

| No. of Students appeared in Examination | 23  |
| No. of First Class                     | 22  |
| No of Second class                     | 01  |
| Pass Percentage                        | 100 %|
| Positions                              | 05  |
| **Name of Students**                  |     |
| Gou Khan Maun                          | 1st |
| Melarihun Lyngkhoi                    | 3rd |
| Yogesh Negi                           | 4th |
| Bijen Singh                           | 7th |
| Plentiful Pyngrope                     | 9th |

### 2014

| No. of Students appeared in Examination | 13  |
| No. of First Class                     | 11  |
| No of Second class                     | 02  |
| Pass Percentage                        | 100 %|
| Positions                              | 03  |
| **Name of Students**                  |     |
| Jasmine Sailo                         | 5th |
| Chayanika Baruah                      | 7th |
| Mary Vanlalhruai                      | 9th |

### 2015

| No. of Students appeared in Examination | 25  |
| No. of First Class                     | 25  |
| No of Second class                     | NIL |
| Pass Percentage                        | 100 %|
| Positions                              | 03  |
| **Name of Students**                  |     |
| Deepshika Nath                         | 3rd |
| Amrita Choudhury                      | 8th |
| Vanita Lyngdoh                        | 10th |
Academic Activities

[2010-2015]

Individual Faculty Profile

Dr Samrat Adhikari
SAMRAT ADHIKARI
PhD [ NEHU]
MSc [ Bangalore University]
BITP [ Mumbai]
NET

Assistant Professor & Head

Environmental Biotechnology & Bioinformatics

01.05.2006

10yrs.

15yrs.

samratadhikari@rediffmail.com
stedmundc.btisnet@nic.in
secbt.hub@dbt.nic.in

Head, Department of Biotechnology, St. Edmund’s College, Shillong
Member, School board of Life Science, NEHU, Shillong
Member, BOS on Biotechnology, NEHU, Shillong
Examiner, UG Examination, NEHU, Shillong
Scrutinizer, UG Examination, NEHU, Shillong
Paper Setter, UG Examination, NEHU, Shillong
Moderator, UG Examination, NEHU, Shillong

Selection Committee Member, St. Edmund’s College, Shillong
Selection Committee Member, St. Edmund’s College, Shillong
Project assessment Committee, St. Edmund’s College, Shillong
Reviewer, Wyno Academic Journal of Biological sciences
Editorial Committee, Academic Publishers, USA.
Member, BOS on Bioinformatics, Mangalore University, Karnataka
Member Biotechnology Club, New Delhi

Bioinformatics Infrastructure Facility [Project Investigator]
Sponsored by Department of Biotechnology, Govt. of India, New Delhi
Total Cost: 75 Lakhs
Status: ongoing

Institutional Biotech Hub Facility [Project Investigator]
Sponsored by Department of Biotechnology, Govt. of India, New Delhi
Total Cost: 42 Lakhs
Status: ongoing
2013 till Present

**STAR COLLEGE SCHEME [Member Secretary]**
Sponsored by Department of Biotechnology, Govt. of India, New Delhi
Total Cost: 88 Lakhs
Status: ongoing

2011-2012

**Bioremediation of Thallium Polluted areas [Project Investigator]**
Sponsored by UGC, Govt. of India, New Delhi
Total Cost: 2 Lakhs.
Status: Completed

HANDS ON TRAINING/WORSHOP ORGANIZED

2010  
3 Days National Workshop on “Bioinformatics – a computational approach to biological information” on 27th – 29th July, 2010. As ORGANIZING SECRETARY

2012  
5-day National Workshop on “Hands on training in Basic Biotechnological Techniques” on 21st to the 25th August, 2012. As ORGANIZING SECRETARY

2014  
5 day Workshop on “Training on basic Techniques in Genomics and Bioinformatics” on 17th to the 21st November, 2014. As ORGANIZING SECRETARY

Organized Science Mela for 3 days 21st November – 23rd November, 2014, as coordinator

2015  
Coordinator , 30 Years of DBT Celebration, for 3 days

AWARENESS PROGRAMME ORGANIZED

2013  
1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 29th April, 2013

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 27th September, 2013

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 21st November, 2013

2014  
1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 24th May, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 28th June, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 26th July, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for
Higher Secondary Science students of Shillong 30th August, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 27th September, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 25th October, 2014

2015

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 28th April, 2015.

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 23rd August, 2015

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 19th September, 2015

FACULTY IMPROVEMENT PROGRAMME ORGANIZED

2014

One day Seminar cum Workshop FIP Programme on “Effective Project Writing” 17th October, 2014. Resource Person: Prof D. D Banerjee, UCMS, GTB Hospital, New Delhi.

POPULAR / GUEST LECTURES ORGANIZED

2014

A Wandering Scientist / Do Science and See the World

1 Day, 12th August, 2014

Prof S. V Eswaran

Emeritus Scientist, CSIR, New Delhi

Distinguished Faculty, St. Stephen’s College, New Delhi

Excitement in Science – It Pays Too

11th August, 2014

Prof S. V Eswaran

Emeritus Scientist, CSIR, New Delhi

Distinguished Faculty, St. Stephen’s College, New Delhi

Genetic Engineering- tools & techniques

1 Day, 18th October, 2014

Dr Tusha Sharma, Department of Biochemistry,
Department of Biotechnology

University College of Medical Sciences & GTB Hospital, New Delhi

“Marine Biotechnology in India: Perspectives and prospects”

2011
1 Day, 7th August, 2011
Mr. Borve D. A Kharsyntiew,
Scholar, SRM University, Chennai, India

“Emerging role of Food Biotechnology”

2011
1 Day, 28th May, 2011
Dr. Saikat Dutta Mazumdar,
CEO, NutriPlus Knowledge Centre, ICRISAT

A lecture on Fundamentals of Bioinformatics

2011
1 Day, 7th June
Ms. P. Priyadarshini, Research Fellow, Auckland University, New Zealand.

2014

“HUMAN GENOME PROJECT”

1 Day, 4th September, 2009
Prof. Anupam Chatterjee,
Molecular Genetics Lab, Deptt. of Biotechnology & Bioinformatics
NEHU, Shillong

MEETINGS ORGANIZED

2014
STAR COLLEGE Advisory meeting – 4th April, 2014 with Dr. Sandhya Shenoy, Joint Director,
Department of Biotechnology, Govt. of India, New Delhi as Expert

STAR COLLEGE Mentoring meeting with Prof. Ashish Mukherjee, Dean, Tezpur University and Dr. Ramendhu Battacharjee, Pro Vice Chancellor, Assam University as Expert on 3rd November, 2014

2015
STAR COLLEGE Advisory meeting – 5th June, 2015 with Dr. Sandhya Shenoy, Joint Director,
Department of Biotechnology, Govt. of India, New Delhi as Expert

Coordinated the STAR COLLEGE ADVISORY MEETING of Department of Biotechnology, Govt. of India for 8 colleges of the North East India.

M Tech THESIS GUIDANCE.

2014
Ms. Abhilasa Mehra, Banasthali University, Rajasthan; Duration 6 months
Ms. Sangrika Mishra, Banasthali University, Rajasthan; Duration 6 months

2013
Mr. Jahnu Saikia, Lovely Professional University, Punjab; Duration 3 Months

**RESEARCH TRAINEE**

2010-2015
Mr. Phiralang Diengdoh, Kuvempu University, Karnataka Duration: 7 months

Ms. Dolly Sewa, NEHU, Shillong; Duration: 6 months
Ms. Selina Nongkhiew, Bangalore University, Duration: 6 months
Mr. Harold Pyngrope, NEHU, Shillong; Duration: 6 months
Ms. Bansuklang Kharmujai, NEHU, Shillong, Duration: 6 Months
Mr. Samudra Sutradhar, NEHU, Shillong Duration: 6 Months
Ms. Mandakini Ksoo, NEHU, Shillong Duration: 6 Months
Mr. Bangeilang Diengnam, JNU, New Delhi Duration 3 Months
Ms. Melarihun Lyngdoh, NEHU, Shillong, Duration 4 months
Ms. Sooni Kerki Challam, NEHU, Shillong, Duration 4 months

**RESEARCH STUDENTS**

SRF
Mr. Nangkyntiew Jungai, MSc NEHU, Shillong

RA
Mr. Bikash Thakuria, MSc Bangalore University

RA
Ms. Philem Priya Darshini, MSc NEHU, Shillong [Presently in New Zealand]

SRF
Mr. Harold B Pyngrope, MSc, NEHU, Shillong [Presently in Singapore]

**RESEARCH PUBLICATIONS [As Corresponding Author]**

2012
Priyadarshini Devi Philem & Samrat Adhikari (2012); Homology modeling, docking studies and functional analysis of various azoreductase accessory interacting proteins of Nostoc sp. PCC7120; Bioinformation; Vol 8(7): 296-300 [**IF=1.5**]

Philem Priyadarshini Devi and Samrat Adhikari (2012); Homology modeling and functional sites prediction of azoreductase enzyme from the cyanobacterium Nostoc sp. PCC7120. Interdisciplinary Sciences computational biology 4:310–318. [**IF=0.66**]

2015

aspera plant and its docking study with p53 protein. International Journal of Extensive Research. 5: 72-78. [IF=2.86]


Bikash Thakuria, Chandra J Singha, Premchand Maisnam and Samrat Adhikari (2015); Functional and catalytic active sites prediction and docking analysis of azoreductase enzyme in Pseudomonas putida with a variety of commercially available azodyes; African Journal of Biotechnology; vol. 14(26), pp. 2162-2169. [IF=0.57]

Jungai, N and Adhikari, S. Genetic Diversity of Free Living Filamentous Cyanobacteria Isolated from a Variety of Coal Mining Areas of Jaintia Hills District, Meghalaya, India. International Journal of Research Studies in Biosciences; Volume 3, Issue 12, December 2015, pp 26-34. ISSN 2349-0365(online); [IF: 2.905]


**ORAL /POSTER PRESENTATION**


Paper Presented on Homology Modelling and Ramachandran Plot on azoreductase enzyme. Presented at the National Conference on Contemporary Bioinformatics Researches in India on 10th November, Organized by Assam University, Silchar, Assam

INVITED LECTURE DELIVERED

2013 Lecture delivered on Recombinant DNA Technology at the National Workshop on Biotechnology Tools & Techniques organized by the Institutional Biotech Hub, GC College, Silchar on 29th – 30th January, 2013

2014 Human Genome Project – its origins; 13th August, 2014, Organized by Department of Biochemistry, St. Edmund’s College, Shillong

PROFESSIONAL TRAINING ATTENDED

2014 Workshop on Evaluation and Paper Setting at UG level, Organized by NEHU exam Centre on 4th – 5th December, 2014

2012 Hands on Training in Gene Cloning, Protein Purification and Crystallization” in Tata Memorial Centre, Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), Kharghar, Navi Mumbai from 2nd- 13th July 2012

Participated in the Edmund Rice Capacity Building Programme held at St. Edmunds College, Shillong on the 10th and 11th February, 2012

2010 Faculty Development Programme, Organized by the Federation of Universities on 13th September, 2010.

WORKSHOP ATTENDED


MEETINGS ATTENDED

2010 Attended the 5th Interactive meeting on North East Bioinformatics Centre held at Institute of Bioresources& Sustainable Development (IBSD), Imphal on 11-12th November, 2010.

Attended the National Annual Bioinformatics Network meeting at Department of Biotechnology, Indian Council of Agriculture Research, Port Blair, Andaman & Nicobar Island, India on 3rd – 4th February, 2010.

2011 Attended the 6th Interactive meeting on North East Bioinformatics Centre held at Department of
Biotechnology, Mizoram University, Aizawl, Mizoram on 11-12th November, 2011.

Attended the National Annual Bioinformatics Network meeting at Department of Biotechnology, Pondicherry University, Puducherry, India on 3rd – 4th February, 2011

2012

Attended the 7th Interactive meeting on North East Bioinformatics Centre held at Department of Life Sciences, Assam University, Silchar, Assam on 11-12th November, 2012.

Attended the First meeting of Coordinators of Colleges supported under STAR COLLEGE Scheme of DBT held on 30th – 31th May, 2012 at SGTB Khalsa College, University of Delhi, New Delhi

Attended the National Annual Bioinformatics Network meeting at Department of Biotechnology, Mata Vaishno Devi University, Katra, Jammu & Kashmir, India on 3rd – 4th February, 2012

Attended the Annual Institutional Biotech Hub meeting at -State Council of Science & Technology, Govt of Sikkim, on 18th – 19th June, 2012.

2013

Attended the National Annual Bioinformatics Network meeting at Bioinformatics Centre, National Institute of Oceanography (NIO) Goa, India on 27th – 28th February, 2013

Attended the STAR Coordinator meeting of Colleges supported under STAR COLLEGE Scheme of DBT held on 5th – 7th August, 2013 at RamnarianRuia College, Matunga, Mumbai.

Attended the Annual Coordinator interactive of Institutional Biotech Hub at –College of Fisheries, Lembucherra,(CAU) Agartala on 21st& 22nd June, 2013

2014

Attended the 7th Interactive meeting on North East Bioinformatics Centre held at Nagaland University, Nagaland on 11-12th November, 2014.

Attended the National Annual Bioinformatics Network meeting at Bioinformatics Centre, National Botanical Research Institute Lucknow, India on 3rd – 4th February, 2014

Meeting with Dr Sandhya Shenoy, Joint Director, Department of Biotechnology, CGO Complex, Govt. of India, New Delhi on 6th February, 2014

Attended the Annual Coordinator interactive of Institutional Biotech Hub at –State Biotech Hub, NEHU, Shillong on 21st & 22nd June, 2014

2015

Attended the National Annual Bioinformatics Network meeting at Bioinformatics Centre, Tirupati University, Tirupati, India on 3rd – 4th February, 2014

Attended the STAR Coordinator meeting of Colleges supported under STAR COLLEGE Scheme of DBT held on 5th – 6th July, 2015 at DBT Head Quarters, New Delhi for STAR STATUS

Attended the STAR Coordinator meeting of Colleges supported under STAR COLLEGE Scheme of DBT held on 19th – 20th November, 2015 at Venkateshwara College, New Delhi

Attended the 8th Interactive meeting on North East Bioinformatics Centre held at Tripura University, Tripura on 21st – 22nd November, 2015.

Attended the Annual Coordinator interactive of Institutional Biotech Hub at –NRC Mithun, Dimapur, Nagaland on 21st& 22nd June, 2015
Academic Activities

[2010-2015]

Individual Faculty Profile

Ms Baiakmenlang Manners
BAIAKMNELANG MANNERS

**Educational Qualification**
PhD [On-going], Gauhati University
MSc [ALU, Coimbatore]

**Designation**
Assistant Professor

**Specialization**
Plant Molecular Biology

**Date of Joining**
01.05.2007

**Teaching Experience**
9 yrs.

**Research Experience**
11 yrs.

**Email:**
oncidium_b@yahoo.co.in

**Academic Positions**

<table>
<thead>
<tr>
<th>Year</th>
<th>Position</th>
</tr>
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<tbody>
<tr>
<td>2010</td>
<td>Member of BUGS in Biotechnology, NEHU, Shillong</td>
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<tr>
<td>2011</td>
<td>Paper setter, NEHU Shillong</td>
</tr>
<tr>
<td>2011</td>
<td>Practical Examiner NEHU Shillong</td>
</tr>
<tr>
<td>2012</td>
<td>Paper setter, NEHU Shillong</td>
</tr>
<tr>
<td>2012</td>
<td>Practical Examiner NEHU Shillong</td>
</tr>
<tr>
<td>2012</td>
<td>Member of BUGS in Biotechnology, NEHU, Shillong</td>
</tr>
<tr>
<td>2013</td>
<td>Examiner, UG Examination, NEHU, Shillong</td>
</tr>
<tr>
<td>2013</td>
<td>Practical Examiner NEHU Shillong</td>
</tr>
<tr>
<td>2013</td>
<td>Scrutinizer, NEHU, Shillong</td>
</tr>
<tr>
<td>2014</td>
<td>Examiner, UG Examination, NEHU, Shillong</td>
</tr>
<tr>
<td>2014</td>
<td>Practical Examiner NEHU Shillong</td>
</tr>
<tr>
<td>2015</td>
<td>Department Coordinator, STAR College Scheme (DBT, Govt. of India)</td>
</tr>
<tr>
<td>2015</td>
<td>Examiner, UG Examination, NEHU, Shillong</td>
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<td>2015</td>
<td>Practical Examiner NEHU Shillong</td>
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**WORKSHOPS ATTENDED**

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Participated in the Edmund Rice Capacity Building Programme held at St. Edmunds College, Shillong on the 10th and 11th February, 2012. Participated in a two day workshop on “Defining the role of Women Scientists and teachers in promotion and application of Science and Technology – Northeast India Perspectives” organized by The National Academy of Sciences, India, North-Eastern Region Local Chapter in collaboration with Lady Keane College, Shillong on May 8-9, 2013</td>
</tr>
<tr>
<td>2014</td>
<td>Participated in a one day Seminar cum Workshop on “Faculty Improvement Programme” at St. Edmunds College Shillong on the 17th October, 2014.</td>
</tr>
</tbody>
</table>
Participated in a one day sensitization workshop on “Technological Empowerment of Women through the SoRF Scheme of DST in collaboration with NASI” organized by National Academy of Sciences, India NER, local chapter, at NEHU, Shillong on the 30th June, 2014.

ORIENTATION PROGRAM ATTENDED

2010  Orientation Programme in Information Technology from 5th Feb, 2010 – 4th March, 2010 organized by the Academic staff college, NEHU, Shillong

INVITED LECTURES/ TRAINING DELIVERED

2012  Course coordinator in the 5-day Workshop entitled “Hands on training in Basic Biotechnological Techniques” organized by the Institutional biotech Hub, Department of Biotechnology, St. Edmunds College Shillong from the 21st to the 25th August, 2012.

2013  Delivered a lecture on a one day workshop entitled “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” organized by the Institutional biotech Hub, Department of Biotechnology, St. Edmunds College Shillongon the 27th July, 2013.

2014  Participated as a Resource Person in the 5 day Workshop entitled “Training on basic Techniques in Genomics and Bioinformatics” organized by the Department of Biotechnology, St. Edmunds College Shillong from the 17th to the 21st November, 2014.

2015  Delivered a lecture on a one day workshop entitled “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” organized by the Institutional biotech Hub, Department of Biotechnology, St. Edmunds College Shillongon the 7th June, 2015.

SEMINARS / WORKSHOPS ORGANIZED

2012  Was an organizing member of the 5-day Workshop entitled “Hands on training in Basic Biotechnological Techniques” organized by the Institutional biotech Hub, Department of Biotechnology, St. Edmunds College Shillong from the 21st to the 25th August, 2012.

2013  Helped organize a one day workshop entitled “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” organized by the Institutional biotech Hub, Department of Biotechnology, St. Edmunds College Shillong on the 27th July, 2013.

2014  Was an organizing member in the 5 day Workshop entitled “Training on basic Techniques in Genomics and Bioinformatics” organized by the Department of Biotechnology, St. Edmunds College Shillong from the 17th to the 21st November, 2014.

2015  Was an organizing member on a one day workshop entitled “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” organized by the Institutional biotech Hub, Department of Biotechnology, St. Edmunds College Shillongon the 7th June, 2015.
**LECTURES ATTENDED**

**2010**
A lecture on Fundamentals of Bioinformatics by Ms. P. Priyadarshini, Research Fellow, IISC, Bangalore.

**2011**
A guest lecture on "Applications of Plant Biotechnology", by Dr.Suman Kumaria, Associate professor, Centre for Advanced studies in Botany, NEHU, Shillong.

An Interactive session with Prof. Michael Keusgen, Dean, Faculty of Pharmacy, Phillip's University, Marburg, Germany, 11th March, 2011

Emerging role of Food Biotechnology” by Dr.Saikat Dutta Mazumdar Chief Operating Officer, NutriPlus Knowledge Program, Agribusiness and Innovation Platform (ICRISAT); 5th May, 2011

Guest lecture by Mr. Borve D. A. Kharsyntiew, Research Scholar, Department of Biotechnology, SRM University, Chennai, Tamil Nadu, 6th June, 2011 on the title Marine Biotechnology in India: Perspectives and Prospects”

Recent Developments in Plant Biotechnology & their applications"Guest: Prof. S. R. Rao, Head Department of Biotechnology, North Eastern Hill University, Shillong, 7th July, 2011

**2014**
Popular lecture delivered by Prof S. V Eswaran Emeritus Scientist, CSIR, New DelhiDistinguished Faculty, St. Stephen's College, New Delhi on the theme "A Wandering Scientist / Do Science and See the World" 12th August, 2014

Guest lecture delivered by Prof. Pratap Jyoyi Handique Dept. of Biotechnology, Guwahati University, Guwahati on the 25th July, 2014 on the title "Plant Biotechnology: tools and techniques”.


**2015**
Guest lecture delivered by Dr Lalmacchhuana, Documentation Officer, NEHU Central Library, Shillong, on the 24th October 2015, on the title Accessing Scholarly Web Resources.

**OTHERS**

**2013**
Was an organizing member for the felicitation programme of the position holders 2013 on 8th August, 2013.

Was a Judge for Slogan writing competition on World Environment day 2013

**2014**
Was a Judge for Poster competition on World Environment day 2014.

Committee Member of the Grievance cell of St. Edmunds College Shillong

Teacher in charge of the Security group of College week 2014.

**2015**
Committee member of the Innovative and Best Practices cell of St. Edmund’s College Shillong
Academic Activities

[2010-2015]

Individual Faculty Profile

Dr. Gopesh Paul
GOPESH PAUL

**Educational Qualification**
- PhD [ ], NEHU, Shillong
- MSc [ NEHU, Shillong]

**Designation**
- Assistant Professor

**Specialization**
- Animal Physiology & Biochemistry

**Date of Joining**
- 01.05.2010

**Teaching Experience**
- 05 yrs

**Research Experience**
- 6 yrs

**Email:**
- paul84g@gmail.com

**Academic Experiences:**
- Member of College Discipline committee 2013-2014
- Departmental equipment purchase Committee 2013-till date
- Department Incharge, Science Mela 2014-2015
- Faculty Incharge for Student tour (National) 2011-2015
- Department Co-ordinator for DBT Star College Scheme 2014 - till date
- Member of DST Central Instrumentation Facility 2014- till date
- Scrutinizer 2013
- Paper Examiner BscIst Year 2013-2015
- Paper Examiner BscIIInd Year 2012-2015
- Paper Examiner BSc Ist Semester 2015
- Practical Examiner (Internal) BscIst Year 2014
- Practical Examiner (Internal) BscIIInd Year 2011-2015
- Practical Examiner (Internal) BSc Ist Semester 2015

**Research Experience:**
- 9 years

**Professional Training attended:**
- NIL

**Seminar/ Workshop Organized:**

**2015**

Organized a One – day Student Seminar under DBT Star College Scheme, for IIInd year B.Sc (Biotechnology Honours) students on 13th of August, 2015.

Organized a One day Workshop on "Accessing Scholarly Web Resources" by Dr. Lalmachhuana, Documentation Officer, NEHU Central Library on 9th June, 2015 at Biotechnology department, St. Edmund’s College.

**Invited Lectures:**
2012  Presented a lecture at seminar on “Challenges in Biochemical research” organized by the Department of Biochemistry, NEHU, Shillong held in March 23, 2012


Seminar/ Workshops Attended:

2011  A 3- day seminar on “Developing intellectual capital skills for the learning economy” held at St. Edmund’s College, Shillong from 31st January – 2nd February 2011.

2013  Participated in the National Conference on Contemporary Bioinformatics Researches in India, organized by Bioinformatics Centre, Assam University, Silchar on 10th November, 2013

2014  Attended a “Workshop on Capacity Building in Effective Management of Intellectual Property Rights (IPRs) in Biotechnology by Universities and Research Institutes in Meghalaya at St. Anthony’s College, Shillong from September 22- 23, 2014

A one day seminar cum workshop on “Faculty Improvement Programme (FIP) at St. Edmund’s College on the 17th October, 2014

2015  Attended a two day workshop on “Biosafety awareness and culture of responsibility” at ICAR NEH Region, Umiam on the 21st and 22nd August, 2015

Attended a seminar held at Avigna Clinical Research Institute, Bangalore on 8th December 2015

Meetings Attended:

2013  Attended the 6th NEBInet Coordinators’ Meet in the Bioinformatics centre, Assam University, Silchar held during 11 & 12 November 2013

Other Activities:

2010  Member of Organizing Committee in The Workshop on “Bioinformatics – A computational Approach to Biological Information” during 27th – 29th July held at Bioinformatics Infrastructure Facility

Member of organizing committee for “National Seminar on Minor Research in Biological Sciences” on 4th December, St. Edmund’s College.
2011  Member of organizing committee for “National Seminar on Minor Research in Biological Sciences” December, St. Edmund’s College.

2012  Member of Organizing committee in a 5 day National Level workshop on “Basic Biotechnology techniques” on 21st – 25th, August held at Biotechnology department, St. Edmund’s College.

2014  As Judge in a seminar on “Biodiversity of North-East India” organized by Department of Botany, St. Edmund’s College, Shillong on 23rd August, 2014.

As Judge in a Seminar Presentation of B.ScIInd Year Biotechnology Honours student organized by Department of Biotechnology, St. Edmund’s College on 28th August, 2014

Incharge for “KaunBanega Scientist Contest” during Science Mela 2014 organized under the STAR College scheme by the Department of Biotechnology, St. Edmund’s College

2015  Incharge for “KaunBanega Scientist Contest” during “Ed Scientia 2015” organized under the STAR College scheme by the Department of Biotechnology, St. Edmund’s College
Academic Activities

[2010-2015]

Individual Faculty Profile

Mr Koben John Nongkynrih
KOGEN JOHN NONGKYNKRIH

**Educational Qualification**
MSc [ NEHU] NET

**Designation**
Assistant Professor

**Specialization**
Microbiology

**Date of Joining**
01.05.2011

**Teaching Experience**
03 yrs

**Research Experience**
5 yrs

**Email:** kobennongkynrih@yahoo.co.in

**Programmes attended:**
“Capacity building” programme organized by the college on the 10th and 11th February, 2012.
2 day workshop on “Effective Management of IPR in Biotechnology” organized by BCIL in St. Anthony’s College, Shillong on 21st and 22nd September, 2014.
ICAR NEH-ASM-SBS Biosafety Awareness Programme and Workshop on: “Culture of Responsibility”, “Pathogen Inventory Management” and “Fundamentals of Working in Biosafety Cabinets” organized at ICAR- Research Complex for NEH Region, Umiam, Meghalaya.

**Research project Guidance:**
M. Sc. Thesis of Mr.PynshngainlangSawian on “Isolation , characterization and molecular studies of microbes in locally fermented alcoholic beverages and their interaction with biological compounds extracted from medicinal plants of Meghalaya”. (2013)
“Isolation and Characterization of Microbial Population present in Swine Nasal Cavity” (2012-2013)
“Characterization of microbial population present in pig’s feed” (2012-2013)
“Standardization of in vitro micropropagation of Citrus latipes” (2013-2014)
“Isolation and characterisation of potential probiotics from local wine of East Khasi Hills, Meghalaya” (2013-2014)
“A study on the antibacterial properties of ’psidiumguajava’ leaves” (2013-2014)

**Other extracurricular involvements:**
Deputed as Expert Adviser for the Recruitment of Assistant Lecturer through MPSC, Shillong on 16th November, 2012.
Course coordinator in the 5-day workshop entitled “Hands on Training in Basic Biotechnological techniques” organized by the Department of Biotechnology, St. Edmund’s College, Shillong from 21st to 25th August, 2012.
Invigilator for the Civil Service (P) Examination, 26th May, 2013.
Resource person for the “Capacity Building, Sensitization and Awareness programme in Biotechnology for Higher

Member of the Interview panel for the selection of Research Associate at the Bioinformatics centre of the College, 30th October, 2013.

Member of the selection committee for the up gradation of salary of the research staff of the department on 16th October, 2015.

Incharge of various activities during the College games every year.

Deputed as Internal examiner for B.Sc. Biotechnology practical exams and Theory Paper Examiner for the Undergraduate Final Examinations conducted by NEHU.

Incharge of various practicals under “Star College Scheme” for undergraduate students which includes:

- Basic techniques in Microscopy
- Agarose Gel Electrophoresis
- Polymerase Chain Reaction
- Plasmid DNA isolation

Resource person in the 5-day Workshop entitled “Training on Basic Techniques in Genomics and Bioinformatics” from 17th to 21st November, 2014.
Academic Activities

[2010-2015]

Individual Faculty Profile

Ms Shekinah Challam
SHEKINAH CHALLAM

Educational Qualification
MSc [NEHU]
NET [UGC]
BET [DBT JRF]

Designation
Assistant Professor

Specialization
Plant Biotechnology

Date of Joining
01.08.2013

Teaching Experience
05 yrs

Research Experience
3 yrs

Email:
shekinah.challam@gmail.com

Academic Experience:
2014
Examiner-NEHU Examinations
Internal Examiner- NEHU Practical Examination in Biotechnology
Member of Discipline Committee in the College
Faculty-in-charge of Departmental Examinations

2015
Examiner- NEHU Examinations
External Examiner for ISC Class 12 Practical Examination in Biotechnology under CISCE
Internal Examiner- NEHU Practical Examination in Biotechnology
Faculty-in-charge of Departmental Examinations

2016
Examiner- NEHU Examinations
External Examiner for ISC Class 12 Practical Examination in Biotechnology under CISCE
Internal Examiner- NEHU Practical Examination in Biotechnology

Professional Training Attended:
2010
Winter School in on “Vistas in Marine Biotechnology” organized by Central Marine Fisheries Research Institute ICAR, Cochin from 5th to 21st October, 2010

2012
Training on "Molecular tools in Biotechnology Teaching and Research" in the Department of Botany, NEHU from 19th to 30th March, 2012
“Hands on Training in Gene Cloning, Protein Purification and Crystallization” in Tata Memorial Centre, Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), Kharghar, Navi Mumbai from 2nd - 13th July, 2012

2015
“Hands on Training in Gene Cloning, Protein Purification and Crystallization” in Tata Memorial Centre, Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), Kharghar, Navi Mumbai from 29th June- 10th July, 2015.

2016
34th Orientation Programme organised by the UGC-HRDC, NEHU from the 25th Jan- 21st Feb, 2016
Seminar/ Workshop Organised:

2014  One Day Student Seminar for Students of 2nd year Biotechnology
      One Day Synopsis Presentation for Students of 3rd Year Biotechnology

2015  One Day Student Seminar for Students of 2nd Year Biotechnology
      One Day Synopsis Presentation for Students of 3rd Year Biotechnology

Invited Lectures Delivered

Resource Person- “Workshop on “Training on Basic Techniques in Genomics and Bioinformatics” from 17th November-21st 2014 in St. Edmund’s College, Shillong.

Resource Person- “Capacity Building, Sensitization and Awareness in Biotechnology for Higher Secondary Science Students of Shillong” on the 21st June 2014

Resource Person- Practical Classes under DBT-Star College Scheme on the 22nd August, 2014

Resource Person- “Educational Outreach Programme for Popularising Biotechnology under DBT-Star College Scheme”

Research Guidance:

1. Antibacterial Properties of Medicinal Plants available in the state of Meghalaya.
2. Micropropagation of Cucurma longa sp available in North East.
3. Identification, isolation of antibacterial properties of secondary metabolites present in Urtica Species found in Shillong.

Workshops and Seminars Attended

2013  Workshop on Biological Techniques and Tools in St. Anthony’s College, Shillong, from 19th – 26th July 2013

2014  Workshop on “Capacity Building in Effective Management in IPR in Biotechnology by Universities and Research Institutes in Meghalaya” in St. Anthony’s College, Shillong, from 22nd -23rd September, 2014

      Workshop on “Faculty Improvement Programme” at St. Edmund’s College on the 17th October, 2014

Others

2014  Organised the Introductory Session for 1st year BSc Students of the College
      Organised Felicitation Programme for Meritorious Students on 25th June, 2014
      Master of Ceremonies for Department and College Functions

      Editor of the Department Magazine ScientiaPotentiaEst

      Teacher in-charge of Inter- College Volley Ball team for Tournament organised by NEH


2015  Judge at the One Day Students seminar under DBT-Star College Scheme on 13th August, 2015.

      Judge at the Inter- College Debate competition organised by the Department of Mass Communication and Video Production, St. Anthony’s College, Shillong on World Photography Day on the 19th August, 2015.

      Teacher in-charge of Women’s Basket Ball during Edblazon 2015

2016  Convener and Editor of the 10 year Anniversary Edition of the Department Magazine ScientiaPotentiaEst
Academic Activities

[2010-2015]

Individual Faculty Profile

Mr Nangkyntiewbor Jungai
NANGKYNTIEWBOR JUNGAI

**Educational Qualification**  
MSc [ NEHU]  
NET  
BET

**Designation**  
Senior Research Fellow

**Specialization**  
rDNA Technology

**Date of Joining**  
01.05.2013

**Teaching Experience**  
01 yrs

**Research Experience**  
3 yrs

**Email:**  
njungai@gmail.com

**POSITIONS HELD**

2013 till present  
SRF, Institutional Biotech Hub, Department of Biotechnology, St. Edmund's College, Shillong.

2012 - 2013  
Lecturer, Department of Biotechnology, St. Edmund's College, Shillong

**HANDS ON TRAINING/WORSHOP ORGANIZED**

2014  
5 day Workshop on "Training on basic Techniques in Genomics and Bioinformatics" on 17th to the 21st November, 2014. As COURSE CO-ORDINATOR

2012  
5-day National Workshop on "Hands on training in Basic Biotechnological Techniques" on 21st to the 25th August, 2012. As COURSE CO-ORDINATOR

**AWARENESS PROGRAMME ORGANIZED**

2014  
1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 24th May, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 28th June, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 26th July, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 30th August, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 27th September, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for
Higher Secondary Science students of Shillong” 25th October, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 29th April, 2013

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 27th September, 2013

POPULAR /GUEST LECTURES ORGANIZED

2014

A Wandering Scientist / Do Science and See the World
1 Day, 12th August, 2014
Prof S. V Eswaran
Emeritus Scientist, CSIR, New Delhi
Distinguished Faculty, St. Stephen’s College, New Delhi

Excitement in Science- It Pays Too
11th August, 2014
Prof S. V Eswaran
Emeritus Scientist, CSIR, New Delhi
Distinguished Faculty, St. Stephen’s College, New Delhi

Genetic Engineering- tools & techniques
1 Day, 18th October, 2014
Dr Tusha Sharma, Department of Biochemistry,
University College of Medical Sciences & GTB Hospital, New Delhi

RESEARCH TRAINEE

2015
Ms. Phinmanlin Kharlyngdoh, St. Edmund’s College, Shillong Duration: 6 months

Ms Angela Lalmunthalang, St. Edmund’s College, Shillong Duration: 6 months

Ms Monisha Bhattacharjee, St. Edmund’s College, Shillong Duration: 6 months

Mr Ankit Kumar Dubey, St. Edmund’s College, Shillong Duration: 6 months

2014
Mr Khrawpyrkhant Nongrum, St. Edmund’s College, Shillong Duration: 6 months

2013
Mr Andrew Lallawma, St. Edmund’s College, Shillong Duration: 6 months

Ms Angela Lalmunthalang, St. Edmund’s College, Shillong Duration: 6 months

Ms, St. Edmund’s College, Shillong Duration: 6 months

Ms Angela Lalmunthalang, St. Edmund’s College, Shillong Duration: 6 months
RESEARCH PUBLICATIONS [PEER REVIEWED]


Nangkyntiewbor Jungai and Samrat Adhikari (2015); Genetic Diversity of Free Living Filamentous Cyanobacteria Isolated from a Variety of Coal Mining Areas of Jaintia Hills District, Meghalaya, India; 3;12. Pp 26-34 [IF:2.921]

INVITED LECTURE DELIVERED

2015  External expert for Project viva voce conducted for undergraduate honours students of Biotechnology as partial fulfillment of the degree course under North Eastern Hill University, Shillong on 23rd April, 2015, at the Institutional Biotech Hub, St. Edmund’s College as a programme initiated under STAR scheme under sponsorship from Department of Biotechnology, Government of India

2014  Delivered a guest lecture in one day workshop on “Capacity Building, Sensitization and Awareness in Biotechnology for Higher Secondary Science Students of Shillong” at Department of Biotechnology, St. Edmund’s College, Shillong on the 26th July, 2014. This programme was organized by Institutional Biotech Hub Facility (Funded by DBT, Govt. of India) in collaboration with IQAC, St. Edmund’s College.

WORKSHOP ATTENDED

2014  Actively participated in the “Workshop on Capacity Building in Effective Management of Intellectual Property Rights (IPRs) in Biotechnology by Universities and Research Institutes in Meghalaya” at St. Anthony’s College, Shillong from September 22-23, 2014 sponsored by Department of Biotechnology, Government of India, organized by Biotech Consortium India Limited (BCIL), New Delhi.

SEMINAR ATTENDED


2011
Attended the lecture on “Emerging trends on Food Biotechnology” delivered by Dr. S.D. Mazumdar, COO, Nutriplus, ICRISAT, Hyderabad, organized by the Department of Biotechnology, St. Edmund’s College, Shillong, Meghalaya, (an initiative under DBT Star College Scheme), funded by DBT, Govt. of India, on the 28th May, 2011.

2008
Participated in the National Seminar on “Toxicity of Chemicals and their Hazards with special reference to Heavy Metals” held on the 23rd & 24th October 2008 at St. Edmund’s College, Shillong.

2009
Attended as Volunteer in the National Workshop on “Computer Interfacing of Physics Experiments” held on the 11th – 13th May, 2009. The Workshop was organized by the Department of Physics, St. Edmund’s College, Shillong in collaboration with the Inter University Accelerator Centre, (An Autonomous Research Centre Under UGC) New Delhi.

EXTENSION ACTIVITIES

2013
UGC – NET Examination Dec, 2013 – Invigilator

UPSC Civil Service Examination Aug, 2013 – Invigilator
Academic Activities

[2010-2015]

Individual Faculty Profile

Mr Bikash Thakuria
BIKASH THAKURIA

**Educational Qualification**  
MSc Bangalore University

**Designation**  
Research Associate (Department of Biotechnology, Govt. of India)

**Specialization**  
Bioinformatics

**Date of Joining**  
01.05.2013

**Teaching Experience**  
1 yrs.

**Research Experience**  
4yrs.

**Email:**  
btbikash@gmail.com

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**RESEARCH AND STUDY**

- A one year project on "Vermicomposting" under the partial fulfillment of B.Sc. Biotechnology under North Eastern Hill University curriculum. (1st June, 2010 – 19th December, 2010).
- DBT traineeship in St. Edmund’s College on bioinformatics (Domain analysis of proteins present Smilax aspera) for six months. (3rd January, 2013 – 19th June, 2013).
- Research Associate, Bioinformatics Infrastructure Facility (BIF), Department of Biotechnology, St. Edmund’s College, Shillong (since 4th November, 2013).

**PAPER PUBLISHED**


**EXPERIENCE**

- Served as a Resource Person in a five days national level workshop on “Training on Basic techniques in Genomics and Proteomics” sponsored by Department of Biotechnology, Govt. of India, organized by
Department of Biotechnology and Internal Quality Assurance Cell (IQAC), St. Edmund’s College, Shillong (November 17-21, 2014).

- Served as an **External Expert** for conducting Viva voce for undergraduate students of Biotechnology as a partial fulfillment of bachelor degree under North Eastern Hill University (NEHU), Shillong at Institutional Biotech HUB Facility, St. Edmund's College funded by DBT, Govt. of India. (April 23rd, 2015).

- Served as a **Resource Person** in one day workshop on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science Students of Shillong” organized by Institutional Biotech HUB Facility (Funded by DBT, Govt. of India) in collaboration with the Internal Quality Assurance Cell (IQAC), St Edmund’s College, Shillong (June 6th, 2015).

- Served as an **External Expert** for conducting Viva Voce for projects of undergraduate students of Biotechnology under North Eastern Hill University (NEHU), Shillong, at Bioinformatics Infrastructure Facility (BIF), Department of Biotechnology, St. Edmund’s College, Shillong (March 18th, 2016).

**CONFERENCES/ WORKSHOPS/ SEMINARS ATTENDED**


- A national level workshop on “Entrepreneurship in life sciences” organized by Department of Life Sciences, KristuJayanti College, Bangalore, India and National Entrepreneurship Network, India (Oct 10-11th,2011).

- A national level workshop on “Effective Management of Intellectual Property Rights in Biotechnology by Universities and Research Institutes in Meghalaya” organized under DBT, Ministry of Science and Technology, Govt. of India in association with BCIL by St. Anthony’s College, Shillong (September 22-23, 2014).

- A national level workshop on “Molecular Docking and Virtual Screening” jointly organized by Bioinformatics Infrastructure Facility, Department of Biotechnology, Mizoram University, Mizoram and Schrödinger, Bangalore, sponsored by Department of Biotechnology, Govt. of India, New Delhi (October 02-04, 2014).

- Attended a national level workshop cum seminar on “**Faculty Improvement Program (FIP)**” organized by St. Edmund’s College, Shillong as an initiative of STAR COLLEGE Departments, funded by DBT, Govt. Of India. (Oct 17th, 2014).

- Attended a national level workshop in College of Veterinary Science (Assam Agriculture University) on “Homologymodelling, Computer Aided Drug Designing and Molecular Docking” sponsored by BTIS program (March 17-21, 2015).

- Attended a NER training course on “Gene cloning, Protein biochemistry, Structural biology and Bioinformatics” organized by DBT Biotechnology/Bioinformatics Training Centre, Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), Kharghar, Navi Mumbai. (July 13-24th, 2015).

**HANDS ON TRAINING/ WORKSHOP ORGANISED**

2014 5 day Workshop on “Training on basic Techniques in Genomics and Bioinformatics” on 17th to the 21st November, 2014. As RESOURCE PERSON.
AWARENESS PROGRAMME ORGANISED

2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 24th May, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 28th June, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 26th July, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 30th August, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 27th September, 2014

1 Day Programme on “Capacity Building, Sensitization and awareness in Biotechnology for Higher Secondary Science students of Shillong” 25th October, 2014

POPULAR/ GUEST LECTURES ORGANIZED

2014

A Wandering Scientist /Do Science and See the World
1 Day, 12th August, 2014
Prof S. V Eswaran
Emeritus Scientist, CSIR, New Delhi
Distinguished Faculty, St. Stephen’s College, New Delhi

Excitement in Science- It Pays Too
11th August, 2014
Prof S. V Eswaran
Emeritus Scientist, CSIR, New Delhi
Distinguished Faculty, St. Stephen’s College, New Delhi

Genetic Engineering- tools & techniques
1 Day, 18th October, 2014
Dr Tusha Sharma, Department of Biochemistry,
University College of Medical Sciences & GTB Hospital, New Delhi

THESIS GUIDANCE [M. Tech]

2014

Ms. Abhilasa Mehra, Banasthali University, Rajasthan; Duration 6 months

Ms. Sangrika Mishra, Banasthali University, Rajasthan; Duration 6 months

Mr Baniateilang Diengngan, JNU, New Delhi: Duration 2 months

RESEARCH TRAINEE

2014

Mr Phiralang Diengdoh, Kuvempu University, Karnataka Duration: 7 months
Programmes Organized By the Department

[2010-2015]

Outreach Activities
OUTREACH ACTIVITIES

2012

Outreach activities  Development of Online Library access facilities in secondary Schools

Sponsoring Agency  Department of Biotechnology, Govt. Of India

Coordinator  Dr Samrat Adhikari

Bioinformatics Centre, St. Edmund's College

Nature of activity  Installation of computers with database facility

Schools  Mawprem Modern High School

Gorkha Pathsala School

St. Edmund’s School

2014

Outreach activities  To Popularize Bioscience as a career

Collaborator  Department of Botany, St. Edmund’s College, Shillong

Sponsoring Agency  Department of Biotechnology, Govt. Of India

Coordinator  Dr Sanjiban Goswami

Associate Professor

Department of Botany, St. Edmund’s College

Dates  21stAugust, 2014

Resource person  Dr Sanjiban Goswami, Department of Botany, St. Edmund’s College

Dr Viki Manners, Department of Botany, St. Edmund’s College

Prof Debulman Syiemiong, Department of Botany, St. Edmund’s College

Schools  Oasis English Secondary School, Nongpoh, RiBhoi District, Meghalaya

Location  Rural

No of Participants  80
### Outreach activities

To Popularize Bioscience as a career

### Collaborator

Department of Botany, St. Edmund's College, Shillong

### Sponsoring Agency

Department of Biotechnology, Govt. Of India

### Coordinator

Dr Sanjiban Goswami  
Associate Professor  
Department of Botany, St. Edmund's College

### Dates

21st August, 2014

### Resource person

Dr Sanjiban Goswami, Department of Botany, St. Edmund's College  
Dr Viki Manners, Department of Botany, St. Edmund's College  
Prof Debulan Syiemiong, Department of Botany, St. Edmund's College

### Schools

Nongkwar Secondary School, Mawlai, Shillong, East Khasi Hills, Meghalaya

### Location

Rural  
78
Programmes Organized By the Department

[2010-2015]

Research Activities
RESEARCH ACTIVITIES

**Topic:** Molecular Identification of cyanobacterial species isolated from various coal mining areas of Jaintia Hills, Meghalaya using 16S rRNA profiling.

**Project Investigator:** Mr Nangkyntiew Jungai and Dr Samrat Adhikari

**Introduction:** Cyanobacteria are the simplest and the oldest prokaryotic organisms to have evolved on earth. They can be used as experimental and model strains for studying the diversification of prokaryotic cells and the physiological processes occurring within the cell. They are classified under gram negative bacterial phyla and occupy the diverse range of habitats. They show a wide range of morphological diversity ranging from unicellular to colonial and filamentous. Cyanobacteria are photosynthetic microorganisms by which they are capable to grow photo-autotrophically in a manner similar to those of eukaryotic algae and plants. They also have the unique ability to fix atmospheric nitrogen. Cyanobacterial ecology can be best understood by matching isolated strains and their counterparts in nature. However, many species of cyanobacteria in culture produce anomalous morphologies that differ from those that are characteristic in nature. Thus, classifications based on phenotypic characteristics do not exactly represent natural grouping when analyzed at the genetic level. To study the taxonomy of cyanobacteria, the base composition is an important genetic character. At all taxonomic levels above species, the sequence analysis of genes encoding small-subunit ribosomal RNA (16S rRNA) is currently the most promising approach for the phylogenetic classification of cyanobacteria. The comparative analysis of 16S ribosomal RNA sequence has been used for the identification and construction of cyanobacterial phylogeny. This work has yielded the submission of 40 nucleotide sequences to NCBI in the GenBank database under accession numbers KR709104-KR709143.

*(This work has been done in full collaboration with the BIF Centre, St. Edmund’s College)*

**Topic:** A study of SOD activity in cyanobacterial cells in response to dye stress.

**Project Investigator:** Mr Nangkyntiew Jungai and Dr Samrat Adhikari

**Introduction:** Superoxide dismutase (SOD, EC 1.15.1.1) belong to a large and ubiquitous family of metalloenzymes that catalyzes the dismutation of a highly toxic and reactive superoxide radical (O$_2^-$), to hydrogen peroxide (H$_2$O$_2$) and oxygen (O$_2$) molecule through a cyclic oxidation-reduction mechanism. It is an antioxidant enzyme that is found in virtually all O$_2$ respiring organisms and acts as the first line of defense to alleviate oxidative stress (McCord and Fridovich, 1969). Generally, SODs have been classified into four main canonical forms depending on the catalytic metals they use. They are FeSOD, MnSOD, Cu/ZnSOD and NiSOD. Besides these four, a cambialistic Fe/MnSOD also exists (Meier et al, Amano et al, Sugio et al, Hiraoka et al).

Studies in unicellular organisms have revealed a complex role of superoxide dismutase (SOD) in aerobic cell metabolism. A compromise in SOD activity can have broad ramifications on cell function, ranging from defects in amino acid metabolism to increases in oxidative damage to DNA. From the studies on organisms genetically defective for SOD, it appears that at least three basic functions can be assigned to this ubiquitous metal-binding enzyme: (1) SODs protect biomolecules against the damage from O$_2^-$; (2) Oxidation by O$_2^-$ of iron-sulfur clusters becomes problematic in cells lacking SOD; and (3) damage to these clusters can inactivate key enzymes involved in amino acid and sugar metabolism and also lead to a mobilization of free iron and an increase in iron-related toxicity. It is noteworthy that from studies in
yeast, all the cellular damage resulting from loss of SOD can be reversed by alterations in the homeostasis of the transition metals copper and manganese. Currently, it remains unclear as to whether these metals are functionally substituting for SOD at the level of $O_2^-$ scavenging, metal buffering, or maintaining the reduced environment of the cell.

**Topic:** Development of suitable bioremediation technique for detoxification of dyes.

**Project Investigator:** Mr Nangkyntiew Jungai and Dr Samrat Adhikari

**Introduction:** Worldwide, dye wastewater has become one of the main sources of severe pollution problems due to the greater demand for textile products and the proportional increase in production and applications of synthetic dyes. It is estimated that over 10,000 different dyes and pigments are used industrially and over 0.7 million tons of synthetic dyes are produced annually worldwide. In the textile industry, up to 200,000 tons of these dyes are lost to effluents every year during dyeing and finishing operations as a result of inefficiency in the dyeing process. Unfortunately, most of these dyes escape conventional wastewater treatment processes and persist in the environment as a result of their high stability against light, temperature, water, detergents, chemicals, and microbial attack. Notwithstanding, industries are required to eliminate color from their effluents containing dyes, before disposal into water bodies, due to environmental legislation.

Among the many different groups of synthetic dyes, triarylmethane (also called triphenylmethane) dyes are one of the most commonly used in the textile industries. Their usage constitutes about 30%-40% of the total consumption of dyes, and they are applied extensively on nylon, cotton, wool, and silk. They are also used for coloring food, oils, fats, waxes, varnishes, cosmetics, paper, leather, and plastics as well as for staining specimens in bacteriological and histopathological processes. With dye tinctorial value usually high, less than 1 ppm of dye in water produces obvious coloration, and the extensive use of these dyes have resulted in highly colored effluents that may affect gas solubility in water bodies and significantly decrease photosynthetic activity in aquatic life because of reduced light penetration. In addition to their visual effect, triarylmethane dyes are generally believed to be toxic and carcinogenic or prepared from other known carcinogens. Several reports have also shown that textile dyes and effluents have toxic effects on plants which perform important ecological functions such as providing a habitat for wildlife, protecting soil from erosion, and providing the organic matter that is so significant to soil fertility. Consequently, it is pertinent to develop efficient treatment strategies for removal of color from dye wastewater.

Various physicochemical methods, such as adsorption on activated carbon, electrocoagulation, flocculation, froth flotation, ion exchange, membrane filtration, ozonation, and reverse osmosis have been used for decolorization of dyes in wastewater. However, these methods are less efficient, costly, of limited applicability, and produce wastes, which are difficult to dispose of. On the contrary, biological processes provide a low-cost, environmentally benign, and efficient alternative for the treatment of dye wastewater.

In this study, cyanobacterial strains, capable of decolorizing triarylmethane dyes were isolated from textile industrial wastewater using the selective enrichment method. The effects of various parameters (such as culture agitation, initial dye concentration, pH, and temperature) on dye decolorization by the bacterial strain were investigated and the toxicity of the products formed after decolorization was determined using plant assay.
**Topic:** Genetic diversity of azoreductase gene using molecular phylogeny tools in cyanobacterial species.

**Project Investigator:** Mr Nangkyntiew Jungai and Dr Samrat Adhikari

**Introduction:** Azo dyes are organic colorants characterized by the presence of one or more azo groups. They are used widely in textile, printing, cosmetics, pharmaceutical, food, and other industries because of their ease of synthesis and chemical stability. In addition, azo compounds are also the most commonly used drugs in the treatment of inflammatory bowel disease. However, the release of these compounds into the environment is undesirable, not only because of their color, but also because many azo compounds and their breakdown products are toxic and/or mutagenic. Biological treatment of azo dyes by the use of bacteria has been studied widely recently. Enzymes that catalyze the reduction of azo groups are termed azoreductases. Utilizing NADH and/or NADPH as an electron donor, azoreductase can decolorize azo dyes into corresponding aromatic amines by reductive cleavage of azo bonds. The decolorization was regarded as the rate-limiting step, which was followed by the aerobic mineralization of the colorless aromatic amines. Initially, acyl carrier protein phosphodiesterase of *E. coli*, encoded by *acpD*, was partially purified, and its N-terminal sequence was obtained. Further study demonstrated that AcpD is a flavin mononucleotide (FMN)-dependent NADH-azoreductase having no acyl carrier protein phosphodiesterase activity. It catalyzes the reductive cleavage of the azo bond in methyl red via a ping-pong mechanism. The *acpD* gene was thus redesignated *azoR*. In this study, the *azoR* gene from various isolates were studied and compared at the molecular level. The sequences of *azoR* genes are to be submitted to NCBI after further BLAST results analysis. Phylogenetic tree construction of the sequences will be done with different statistical parameters.

**Topic:** Cloning and expression of *azoR* gene from cyanobacteria and its proteomics study.

**Project Investigator:** Mr Nangkyntiew Jungai and Dr Samrat Adhikari

**Introduction:** Azo dyes are regarded as pollutants because they are not readily reduced under aerobic conditions. *Bacillus* sp. OY1-2 transforms azo dyes into colorless compounds, and this reduction is mediated by a reductase activity for the azo group in the presence of NADPH. A 1.2-kbp *EcoRI* fragment containing the gene that encodes azoreductase was cloned by screening the genomic library of *Bacillus* sp. OY1-2 with digoxigenin-labeled probe designed from the N-terminal amino acid sequence of the purified enzyme. An open reading frame encoding the azoreductase, consisting of 178 amino acids, was predicted from the nucleotide sequence. *Escherichia coli*-expressing recombinant azoreductase gave a ten times greater reducing activity toward azo dyes than the original *Bacillus* sp. OY1-2. This is the first report describing the sequencing and characterization of a gene encoding the azo dye-reducing enzyme, azoreductase, from aerobic bacteria and its expression in *E. coli*. Synthetic azo dyes are extensively used in the textile, food, and cosmetics industries. More than $7 \times 10^5$ tons of these dyes are produced annually worldwide. Most azo dyes are released into the environment as waste from the textile, food, cosmetic, and dyestuff manufacturing industries. They are frequently found in a chemically unchanged form even after waste-water treatment, so they are regarded as pollutants. The treatment system of colored waste-water, based on physical or chemical procedures, is effective but suffers from such shortcomings as high cost, formation of hazardous byproducts, and intensive energy requirements. In
contrast, biological degradation of these dyes does not have similar problems. To establish biological waste-water treatment of azo dye, it is essential to discover the microorganisms that carry the azo dye-degrading enzymes. To accomplish this, we have isolated cyanobacterial strains that reduce azo dyes from soil and sewage samples. These strains were identified as Nostoc sp., Anabaena sp. The enzymes produced by these cyanobacteria catalyze the reduction of Methyl Red and produce dimethyl p-phenylenediamine and o-aminobenzoic acid. Molecular cloning of the gene encoding this enzyme is essential for further characterization as well as for technological applications of this enzyme. In this report, we show the molecular cloning and characterization of the gene encoding the azoreductase from cyanobacterial species and present the characteristics of recombinant azoreductase expressed in E. coli.

**Topic:** A study on the molecular marker profiling of a variety of fresh water cyanobacteria isolated from East Khasi Hills District of Meghalaya.

**Project Investigator:** Mr Nangkyntiew Jungai and Dr Samrat Adhikari

**Introduction:** Cyanobacteria are a morphologically diverse group of bacteria ranging from unicellular, colonial and filamentous forms. The latest taxonomic reclassification of cyanobacteria separated them in six orders: Gloeobacterales, Chroococcales, Pleurocapsales, Oscillatoriales, Nostocales and Stigonematales.

Traditionally, the classification of cyanobacteria has been based on morphological characters such as trichome width, cell size, division planes, shape and arrangement, pigmentation and the presence of characters such as gas vacuoles and a sheath. Beyond the considerable expertise required to identify species by such characters, the subjective judgment by operators can lead to errors, resulting in incorrect assignment of isolates. Reports have estimated that more than 50% of the strains in culture collections are misidentified. Moreover, some diagnostician features, such as gas vacuoles or akinetes, can present variations with different environmental or growth conditions and even be lost during cultivation. Such limitations of phenotypic characters highlighted the requirement of more reliable methods and promoted molecular approaches in cyanobacterial taxonomy, including DNA base composition, DNA and RNA hybridizations, genes sequencing, and PCR fingerprinting. As axenic cultures are difficult to obtain, cyanobacterial specific methods not requiring them revealed to be of utmost importance.

Repetitive sequences constitute an important part of the prokaryotic genome. Regardless of their unknown function, and how these are maintained and dispersed, their presence, widespread distribution and high conservation make them methodologically important for DNA fingerprinting and allow their use as an alternative for the identification of species or strains and diversity studies. In the particular case of cyanobacteria, a family of repetitive sequences, the short tandemly repetitive repeats (STRR) sequences, has been described. These heptanucleotide sequences have been identified in several cyanobacterial genera and species, so far mostly in heterocystous cyanobacteria. Furthermore, a 37bp long tandemly repetitive repeats (LTRR) sequence has also been identified in some cyanobacterial species. Analysis of STRRs and LTRRs has been described as powerful tools for taxonomic studies. Moreover, the specificity of these sequences has made the STRR useful even for non-axenic cyanobacterial cultures. A universal marker for DNA fingerprinting is the oligonucleotide csM13. It has been already tested in a small number of cyanobacteria to demonstrated ability to differentiate strains at intra-specific level. On the other hand, techniques based on
enterobacterial repetitive intergenic consensus (ERIC) have also been used for identification and differentiation purposes in some cyanobacteria.

The restriction fragment length polymorphisms (RFLPs) of particular PCR products can provide signature profiles specific to the genus, species, or even strains. Genetic characterization of cyanobacterial strains has been undertaken using restriction fragment length polymorphisms of the 16S rRNA gene (16S PCR-RFLPs) and of the intergenic transcribed spacer region (ITS-ARDRA). Furthermore, the amplification of the 16S-23S rRNA internal transcribed spacer (ITS) that have shown to be polymorphic in length in cyanobacteria, can also be used has an identification tool.

A sequential polyphasic approach was used in this study. The isolates were identified by observation of their morphological features. A hierarchical analysis with STRR and LTRPCR fingerprinting patterns was performed and representatives of the clusters obtained were identified by a phylogenetic analysis carried out using two genes, one coding for the small subunit rDNA (16S rRNA gene) and the other for the DNA-dependent RNA polymerase subunit (rpoC1). Subsequent characterization of all isolates by M13 and ERIC fingerprints allowed the differentiation of strains, revealing also the traceability potential of these last methods for routine freshwaters monitoring. Furthermore, a diagnostic key was constructed for the identification of cyanobacterial species, based on the use of 16SPCR-RFLPs, ITS dimension and ITS-ARDRA.

**Topic:** A study on the bioactive compounds from cyanobacteria isolated from various habitats of Meghalaya

**Project Investigator:** Mr Nangkyntiew Jungai and Dr Samrat Adhikari

**Introduction:** Cyanobacteria are a very old group of organisms and represent relics of the oldest photoautotrophic vegetation in the world that occur in freshwater, marine and terrestrial habitats. Cyanobacteria, the blue green algae are an assemblage of gram negative eubacteria widely distributed throughout the world. Cyanobacteria are rich sources of structurally novel and biologically active metabolites. Recent studies indicate the presence of some bioactive compounds in the freshwater blue green algae which are shown to exhibit anticancer, antimicrobial, antifungal or anti-inflammatory and other pharmacological activities. In general isolation of bioactive compounds from cyanobacteria is done with two objectives. One is to discover new compounds for pharmaceutical, agricultural or biological application. The other is for the better understanding of the interactions of individual organisms within their natural communities. For each of these purposes, there is a need to screen new organisms. Biologically active substances were proved to be extracted from microalgae. Various strains of cyanobacteria are known to produce intracellular and extracellular metabolites with diverse biological activities such as antialgal, antibacterial, antifungal and antiviral activity. Temperature of incubation, pH of the culture medium, incubation period, medium constituents and light intensity are the important factors influencing the production of antimicrobial agents. Screening of cyanobacteria for antibiotics and other pharmacologically active compounds, has received ever-increasing interest as a potential source for new drugs. Cyanobacteria from local habitats seem to be a source of potential new active substances that could contribute to reduction of the number of bacteria, fungi, viruses and other microorganisms. The aim of the present work was to study the antimicrobial activity of cell extracts of various cyanobacteria in vitro against some selected Gram-positive, Gram-negative bacteria and pathogenic fungi.
**Topic:** Cloning and expression of DNT from *Bordetella bronchiseptica*

**Project Investigator:** Mr Nangkyntiew Jungai and Dr Samrat Adhikari

**Introduction:** The genus *Bordetella* is composed of several closely related species, which are all respiratory pathogens (38). *Bordetella pertussis* and *B. parapertussis* are human pathogens which cause whooping cough and pertussis-like disease, respectively. *B. avium* causes rhinotracheitis of birds, and *B. bronchiseptica* is a pathogen of several animal species, being particularly associated with atrophic rhinitis in pigs and kennel cough in dogs.

*Bordetella bronchiseptica* is one of the etiologic agents causing atrophic rhinitis and pneumonia in swine. It produces several purported virulence factors, including the dermonecrotic toxin (DNT), which has been implicated in the turbinate atrophy seen in cases of atrophic rhinitis. The purpose of these experiments was to clarify the role of this toxin in respiratory disease by comparing the pathogenicity in swine of two isogenic mutants to their virulent DNT+ parent strains. Two separate experiments were performed, one with each of the mutant-parent pairs. One-week-old cesarean-derived, colostrum-deprived pigs were inoculated intranasally with the parent strain, the dnt mutant strain, or phosphate-buffered saline. Weekly nasal washes were performed to monitor colonization of the nasal cavity, and the pigs were euthanized 4 weeks after inoculation to determine colonization of tissues and to examine the respiratory tract for pathology. There was evidence that colonization of the upper respiratory tract, but not the lower respiratory tract, was slightly greater for the parent strains than for the dnt mutants. Moderate turbinate atrophy and bronchopneumonia were found in most pigs given the parent strains, while there was no turbinate atrophy or pneumonia in pigs challenged with the dnt mutant strains. Therefore, production of DNT by *B. bronchiseptica* is necessary to produce the lesions of turbinate atrophy and bronchopneumonia in pigs infected with this organism. Because of the difficulties with purification and the absence of cloned, recombinant DNT (rDNT), progress in determining the molecular mode of action of the toxin or its role in disease has been relatively slow. It was, however, reported that DNT inhibited elevation of alkaline phosphatase activity and reduced the accumulation of type 1 collagen in an osteoblast-like cell line, suggesting that the toxin might impair the ability of cells to differentiate. In addition, DNT stimulated DNA and protein synthesis in these cells, leading to polynucleation, and induced the assembly of actin stress fibers and focal adhesions. DNT is believed to cause these effects by directly modifying the small GTP-binding protein RhoA. The aim of this work was to clone and express the DNT gene from *B. bronchiseptica* in *E. coli*.

**Title:** Homology modeling of functional proteins of Smilax aspera plant and its docking study with p53 protein.

**Project Investigator:** Mr Bikash Thakuria and Dr Samrat Adhikari

Secondary metabolites from *Smilax aspera* plant, also known as Sarsaparilla possesses vital proteins which are capable of treating various ailments and are of great medicinal value. Interestingly this plant has been less exploited for medicinal properties and hence the present study is based on the in silico approach to characterize the important functional proteins and its role in inhibiting the proliferation of the p53 protein during cancer cells proliferation. Twenty two proteins important functional proteins from this plant have been reported but only five proteins were selected due to the availability of their complete sequences. These five sequences were further explored for the putative domain content, homology modeling, computation of the physiochemical properties and finally docking analysis with the p53 protein using PATCHDOCK server. The results suggest that among the five proteins, Ribulose 1, 5-bisphosphate carboxylase oxygenase with the template of 1WDD...
has the highest docking score followed by the other proteins from this plant. The analysis further reveals that these structurally important functional proteins may probably be engineered for developing suitable agents for anti-cancer therapy.

**Title:** An in silico study on the hydrogen peroxide binding of homology modeled cyanobacterial catalase-peroxidase enzyme from *Cyanobacterium aponinum* and *Synechococcus sp. NKBG042902.*

**Project Investigator:** Mr Bikash Thakuria and Dr Samrat Adhikari

Hydrogen peroxide is one of the frequently occurring reactive oxygen species which occurs as a result of aerobic metabolism. Its stepwise degradation by the catalase-peroxidase enzyme is therefore of crucial importance. Homology modeling of catalase and peroxidase with the *Synechococcus sp. PCC 7942* catalase-peroxidase using Swiss-Model server was attempted and the protein models were validated using ProCheck through Ramachandran Plot analysis. In order to study the binding activities of H$_2$O$_2$ in each of the catalase and peroxidase models, docking analysis was carried out using the SwissDock server. Two docking models each corresponding to a catalase and peroxidase with minimal energy scores were obtained. This present study will be helpful in understanding the binding interactions of hydrogen peroxide in cyanobacterial processes.

**Title:** Catalytic site prediction of Azoreductase enzyme of *E. coli* with potentially important industrial dyes using molecular docking tools.

**Project Investigator:** Mr Bikash Thakuria and Dr Samrat Adhikari

Azoreductase is an FMN-dependent and NADH dependent enzyme of *Escherichia coli*. This enzyme is responsible for the degradation of azo dyes. In this study, we retrieved the crystal structure of the enzyme from PDB and 18 azo dyes from NCBI PubChem compound. These azo dyes were then docked with the FMN-dependent NADH-azoreductase enzyme to analyze the binding affinity of the azo dyes with the enzyme and predict the catalytic sites. In this approach, we identify the catalytic residues of FMN-dependent and NADH dependent enzyme of *Escherichia coli* which were then evaluated in terms of properties including function, conservation, hydrogen bonding, B-factor and flexibility. The results indicate that Phe-172, Glu-174, Lys-145, Asp-146 and Lys-169 play an important role as catalytic site residues in the enzyme. It is hoped that this information will provide a better understanding of enzyme mechanisms and also used to improve the designing strategies for dyes detoxification. In this study, the approach emphasizes on a better understanding of the biodegradation of some of the commercially important azodyes mediated by azoreductase from *E. coli*. Furthermore, the catalytic site residues information is essential for understanding and altering the substrate specificity and for the design of a harmless azodye.
Title: Functionally and catalytic active sites prediction and docking analysis of azoreductase enzyme in *Pseudomonas putida* with a variety of commercially available azo dyes.

**Project Investigator:** Mr Bikash Thakuria and Dr Samrat Adhikari

The initial critical step of reduction of azo bond during the metabolism of azo dyes is catalyzed by a group of NADH and FAD dependent enzyme called azoreductases. Although several azoreductases have been identified from microorganisms and partially characterized, very little is known about the structural basis of the substrate specificity and the nature of catalysis. Azoreductase enzyme of *Pseudomonas putida* has a wider broad spectrum of substrate specificity and capable of degrading a wide variety of azo dyes. In the present study, the crystal structure of the enzyme from PDB and 10 azo dyes from NCBI PubChem compound were retrieved and their interactions were studied. These azo dyes were then docked with the FMN-dependent NADH-azoreductase enzyme to analyze the binding affinity of the azo dyes with the enzyme and predict the catalytic sites. Consequently, the catalytic residues of FMN dependent and NADH dependent enzyme were then analyzed in terms of properties including function, hydrogen bonding and flexibility. The results suggest that Ala-114, Phe-172 and Glu-174 play a predominant role as catalytic site residues in the enzyme. Furthermore, the approach emphasis on predicting the active sites of this enzyme where substrates can bind in order to give a better understanding of the biodegradation of some of the commercially important azo dyes mediated by azoreductase. These results will pave way for further increase in azoreductase activity and for better understanding of the dye degradation pathway.

Title: Homology modeling, docking studies and functional analysis of various azoreductase accessory interacting proteins of *Nostoc* sp. PCC7120

**Project Investigator:** Mr Bikash Thakuria and Dr Samrat Adhikari

Azo dyes have become a threat to public health because of its toxicity and carcinogenicity. Azoreductase enzyme plays a pivotal role in the degradation of azo dyes released by industrial effluents and other resources. The degradation pathway has to be studied in detail for increasing the activity of azoreductase and for better degradation of azo dyes. But the data available on cyanobacterial azoreductase enzyme and its degradation pathway are still very less. Therefore the present work explored the azoreductase pathway of the cyanobacterium *Nostoc* sp. PCC7120 for better understanding of the degradation pathway and the other accessory interacting proteins involved. The accessory interacting proteins of azoreductase from cyanobacterium *Nostoc* sp. PCC7120 were obtained from STRING database. The proteins do not have a comprehensive three dimensional structure and are hypothetical. The secondary structure and functional analysis indicated that the proteins are all soluble proteins, without disulphide bonds and have alpha helices only. The structural prediction and docking study showed that alr2106, alr1063 and alr2326 have best docking result which tally with the STRING database confidence score and thus these proteins could possibly enhance the azoreductase activity and better dye degradation. These results will pave way for further increase in azoreductase activity and for better understanding of the dye degradation pathway.
**Title**: Homology modelling and functional sites prediction of azoreductase enzyme from the cyanobacterium Nostoc sp. PCC7120.

**Project Investigator**: Mr Bikash Thakuria and Dr Samrat Adhikari

Industrial dyes such as azodyes are potential environmental pollutants causing deleterious health hazards complications. These dyes are potentially degraded by azoreductase enzyme which is widely distributed in bacteria and also cyanobacteria. The azoreductase enzymes from cyanobacteria have not been explored in detail. Hence this enzyme from Nostoc sp. PCC 7120 has been addressed in detail in the present study considering to explore the physico-chemical properties, evolutionary relationships, functional sites and structural properties using various bioinformatics tools. Four conserved regions were obtained from the multiple sequence analysis. The multiple sequence alignment showed conserved regions at different stretches from 1–11, 40–57, 82–120 and 161–177 amino acid residues. These regions could be used for designing degenerate primers or probes for PCR-based amplification or hybridization-based detection of azoreductase sequences from different source organisms. Domain analysis and functional site prediction showed the presence of functional sites and domain such as flavodoxin like fold responsible for enzyme activity. 3D model was constructed and the best model was selected and validated. Superimposition of the final structure and the template showed variations in certain regions which might be involved in the accommodation of various dyes. Our results may be helpful for further investigations like docking studies as well as in vivo and in vitro conditions although these predictions still need to be studied.

**Title**: A study on the genetic diversity of Myrica species in Meghalaya.

**Project Investigator**: Prof B. Manners

Myrica sp has been a very important plant for the traditional practitioner in context to Meghalaya where it is used as a local medicine for treating many diseases. Moreover the the genetic improvement of any organism depends on the existence, nature and extent of the genetic variability available for manipulation. The partitioning of variability between and within populations will influence the breeding strategy to be adopted. So far there have been no reports on the genetic variability within the gene pools of M. esculenta and between M. esculenta and M. nagi to show genetic variability among plants of a population or between species. Henceforth this project emphasises to evaluate the genetic pool parameters of the plants which are diversely distributed in this region.

**Title**: Decolourization and adsorption of monoazo dye Solochrome Black by cyanobacteria

**Project Investigator**: Dr Gopesh Paul

Azodyes, used in textile industries are toxic to most organisms. They are degraded through microbial activity after discharge as industrial effluent. Decolourization and biosorption of azodyes by cyanobacteria is becoming an attractive option for the biological treatment of textile effluents. Very few studies have focused attention on the use of cyanobacteria for treatment of toxic effluents contaminated with dyes (Omar 2008). Solochrome black (SB) is one of the dyes used commonly in textile industries. To our knowledge, microbial degradation of this monoazo dye has not been studied. In order to evaluate the potential of cyanobacteria for bioremediation of solochrome black dye from industrial effluents, the present study is carried to test four cyanobacterial strains namely Nostoc calcicola, Anabaena cycadae, Anabaena variabilis and Nostoc muscorum for their capacity to decolorize Solochrome Black (SB) in dye amended cyanobacterial culture medium.
Title: Stimulatory effects of azo dyes - Congo red and Solochrome black on antioxidant enzymes of cyanobacteria.

Project Investigator: Dr Gopesh Paul

Toxicity of dyes creates various physiological stresses on cyanobacterial cells leading to generation of free radicals which in turn induces the production of reactive oxygen species (ROS). Under normal circumstances, the concentration of oxygen radicals remains low because of the activity of antioxidant enzymes such as superoxide dismutase (SOD) that provide a defense system for survival of cyanobacteria. Malondialdehyde (MDA) is a cytotoxic product of lipid peroxidation and an indicator of free radical production and consequent tissue damage. Cyanobacterial cultures treated with various concentrations of dyes under stress show considerable increase in their antioxidant enzymes.

Title: A broad prospective role of cyanobacteria in biodiesel production.

Project Investigator: Dr Gopesh Paul

Algae (cyanobacteria) may prove to be an economical choice for biodiesel production because of its availability, low cost, easy to cultivate and which reduces carbon dioxide pollution in the environment. Present research work may also lead to an understanding on the influence of cultural conditions on biodiesel production; the alga can be exploited for outdoor cultivation.
Extra Courses Conducted By the Department

[2010-2015]

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<td>Toxicity of salt to cyanobacteria Nostoc muscorum</td>
<td>Duration: 6 months, Sponsoring Agency: DBT, New Delhi Under STAR SCHEME &amp; College Grant</td>
<td></td>
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<tr>
<td>Microbiology quality of milk and prevalence of microbes in cowsheds</td>
<td>Duration: 6 months</td>
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<tr>
<td><strong>Project Title</strong></td>
<td>Asymbiotic germination of orchids for their conservation using plant biotechnology tools</td>
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</tr>
<tr>
<td><strong>Duration</strong></td>
<td>6 months</td>
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<tr>
<td><strong>Sponsoring Agency</strong></td>
<td>DBT, New Delhi Under STAR SCHEME &amp; College Grant</td>
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<thead>
<tr>
<th><strong>Project Title</strong></th>
<th>Study on the effect of Zanthoxylum khasianumon bacteria causing dental caries</th>
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<tbody>
<tr>
<td><strong>Duration</strong></td>
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<tr>
<td><strong>Sponsoring Agency</strong></td>
<td>DBT, New Delhi Under STAR SCHEME &amp; College Grant</td>
</tr>
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<table>
<thead>
<tr>
<th><strong>Project Title</strong></th>
<th>Effect of garlic extract on Alternaria solani</th>
</tr>
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<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>6 months</td>
</tr>
<tr>
<td><strong>Sponsoring Agency</strong></td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th><strong>Project Title</strong></th>
<th>Isolation and characterization of microbes isolated from Swine (pig) nasal cavity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>6 months</td>
</tr>
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<td><strong>Sponsoring Agency</strong></td>
<td>DBT, New Delhi Under STAR SCHEME &amp; College Grant</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Project Title</strong></th>
<th>An evaluation on the toxic behavior of Solochrome Black in the marine cyanobacterium minutes (BDU20373) and Plectonematerebrans</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>6 months</td>
</tr>
<tr>
<td><strong>Sponsoring Agency</strong></td>
<td>DBT, New Delhi Under STAR SCHEME &amp; College Grant</td>
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<table>
<thead>
<tr>
<th><strong>Project Title</strong></th>
<th>Isolation and characterization of microbes isolated from pig's feed</th>
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<tr>
<td><strong>Duration</strong></td>
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</tr>
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<td><strong>Sponsoring Agency</strong></td>
<td>DBT, New Delhi Under STAR SCHEME &amp; College Grant</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Project Title</strong></th>
<th>A study on the toxicity of diazodye “congo red” in marine cyanobacterium phormidium angustisimum (BDU11391) and its bioaccumulation</th>
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<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>6 months</td>
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<tr>
<td><strong>Sponsoring Agency</strong></td>
<td>DBT, New Delhi Under STAR SCHEME &amp; College Grant</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Project Title</strong></th>
<th>A study on the conserved domains and phylogenetic tree of Hemocyanin protein</th>
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<tbody>
<tr>
<td><strong>Duration</strong></td>
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<td>Project Title</td>
<td>Duration</td>
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<tr>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td>Biodegradation potential of marine cyanobacterium <em>Lyngbya confervoides</em> (BDU142001) on methylene blue</td>
<td>6 months</td>
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<td><strong>2013</strong></td>
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<tr>
<td>Project Title</td>
<td>Duration</td>
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<td>An evaluation on the toxic behavior of Bismarck Brown Y in the marine cyanobacterium <em>Chroococcus minutiae</em> (BDU203730) and <em>Plectonema rebrans</em> (BDU92192)</td>
<td>6 months</td>
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<tr>
<td>Project Title</td>
<td>Duration</td>
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<tr>
<td>A study of the effect of uranyl acetate on the growth, physiological and biochemical assays of freshwater cyanobacteria</td>
<td>6 months</td>
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<tr>
<td>Project Title</td>
<td>Duration</td>
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<tr>
<td>A study on the effect of thallium on the growth, physiology and biochemical assays on heterocystous freshwater cyanobacteria</td>
<td>6 months</td>
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<tr>
<td><strong>2013</strong></td>
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<tr>
<td>Project Title</td>
<td>Duration</td>
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<tr>
<td>Study of antibacterial property of extracts of some locally available medicinal plants and stimulation of in vitro production of the active components</td>
<td>6 months</td>
</tr>
<tr>
<td>Project Title</td>
<td>Duration</td>
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<tr>
<td>A study on the antimicrobial property and genetic diversity of <em>Myrica</em> species in Meghalaya</td>
<td>6 months</td>
</tr>
<tr>
<td>Project Title</td>
<td>Duration</td>
</tr>
<tr>
<td>Isolation and characterization of potential probiotics from locally fermented wine of Shillong</td>
<td>6 months</td>
</tr>
<tr>
<td>Project Title</td>
<td>Duration</td>
</tr>
<tr>
<td>A study on the Antioxidant properties of the cyanobacterium <em>Nostoc calcicola</em> and <em>Anabaena variabilis</em> with a variety of Dyes - Malachite green, Eosin Yellow, Carmine and Erichrome Black T</td>
<td>6 months</td>
</tr>
</tbody>
</table>
Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

**Project Title:** A study on the bioactive compounds from cyanobacteria isolated from various habitats of Meghalaya.

Duration: 6 months

Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

**Project Title:** A study on the molecular marker profiling of a variety of fresh water cyanobacteria isolated from East Khasi Hills District of Meghalaya

Duration: 6 months

Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

**Project Title:** A broad prospective role of cyanobacteria in biodiesel production

Duration: 6 months

Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

**Project Title:** In silico based approach to study the interaction of commercially important dyes with azoreductase enzyme retrieved from Pseudomonas putida

Duration: 6 months

Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

2014

**Project Title:** Comparative analysis of antibacterial property of traditionally used medicinal plant of East Khasi Hills

Duration: 6 months

Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

**Project Title:** Antibacterial property of locally available plants

Duration: 6 months

Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

**Project Title:** Phylogenetic analysis of ERIC, HIP, M13 and rpo genes in a variety of freshwater cyanobacteria isolated from Jaintia Hills of Meghalaya

Duration: 6 months

Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

**Project Title:** Antibacterial and Phytochemical analysis of leaf extract of Zanthoxylum armatum
Duration 6 months  
Sponsoring Agency DBT, New Delhi Under STAR SCHEME & College Grant  
Project Title An in silico based study on barophycin, docastatin, cryptophycin and its effect on P53 molecule causing an anti-cancer effect  
Duration 6 months  
Sponsoring Agency DBT, New Delhi Under STAR SCHEME & College Grant  
Project Title Analysis of bacterial species in rotten cured Areca catechu Linn from East Khasi Hills, Meghalaya.  
Duration 6 months  
Sponsoring Agency DBT, New Delhi Under STAR SCHEME & College Grant  
Project Title A study on the isolation of cyanobacteria from lichens and its potential role in fixing atmospheric nitrogen in rice field.  
Duration 6 months  
Sponsoring Agency DBT, New Delhi Under STAR SCHEME & College Grant  
Project Title Antibacterial and Phytochemical analysis of leaf extract of Myrica esculenta.  
Duration 6 months  
Sponsoring Agency DBT, New Delhi Under STAR SCHEME & College Grant  
Project Title Micropropagation of Cucurma longa  
Duration 6 months  
Sponsoring Agency DBT, New Delhi Under STAR SCHEME & College Grant  

**2015**  
Project Title Phylogenetic analysis of ERIC, HIP, M13 and rpo genes in a variety of freshwater cyanobacteria isolated from Jaintia Hills of Meghalaya  
Duration 6 months  
Sponsoring Agency DBT, New Delhi Under STAR SCHEME & College Grant  
Project Title A bioinformatics approach to increase the activity of the chromophoric proteins of cyanobacteria by ligand docking study.  
Duration 6 months  
Sponsoring Agency DBT, New Delhi Under STAR SCHEME & College Grant  
Project Title A study on the role of antioxidant enzymes and proline in cyanobacteria under salt and pH
Project Title: Antibacterial and Phytochemical analysis of leaf extract of Zanthoxylum armatumga
Duration: 6 months
Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

Project Title: The effect of benzopyrene and chrysene on P53 molecule and its relative effects
Duration: 6 months
Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

Project Title: Homology modelling, functional site location and molecular docking analysis of skin proteins with chemical ingredients commercially available in fairness cosmetic creams.
Duration: 6 months
Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

Project Title: Molecular characterization of Rubredoxin protein and its role in photosynthetic system using in silico approach.
Duration: 6 months
Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant

Project Title: Antibacterial and Phytochemical analysis of leaf extract of Myrica esculenta.
Duration: 6 months
Sponsoring Agency: DBT, New Delhi Under STAR SCHEME & College Grant
Extra Courses Conducted By the Department

[2010-2015]

STAR Practicals
### Department of Biotechnology

#### STAR PRACTICAL CONDUCTED BY THE DEPARTMENT

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>Mode of presentation</th>
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</thead>
<tbody>
<tr>
<td>UG Class</td>
<td>Title of the Practical</td>
<td></td>
</tr>
<tr>
<td>BSc I</td>
<td>Estimation of Protein by Lowry’s method.</td>
<td>Hands on</td>
</tr>
<tr>
<td></td>
<td>ABO Bloodtyping</td>
<td>Hands on</td>
</tr>
<tr>
<td></td>
<td>Polytenechromosomestudy</td>
<td>Hands on</td>
</tr>
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<td></td>
<td>Estimationoflipids</td>
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</tr>
<tr>
<td>BSc II</td>
<td>Agarosegel electrophoresis.</td>
<td>Hands on</td>
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<td>SDS PAGE</td>
<td>Hands on</td>
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<tr>
<td></td>
<td>Bloodsmear identificationby Giemsastain</td>
<td>Hands on</td>
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<td></td>
<td>Estimationof ureainblood</td>
<td>Hands on</td>
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<tr>
<td>BSc III</td>
<td>Isolation ofplasmidDNA</td>
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</tr>
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<td>Restriction digestion ofDNA</td>
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<td>Demonstration</td>
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<tr>
<td>Year</td>
<td>Course</td>
<td>Type</td>
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<tr>
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</table>
| 2013 | BSc III  
Isolation of plasmidDNA                  | Hands on |
|      | Restriction digestion of DNA                 | Hands on |
|      | Bioinformatics Practical’s                   | Demonstration |
| 2014 | BSc I  
Analysis of lipids using chromatography techniques | Hands on |
|      | Alpha amylase activity                        | Hands on |
|      | Determination of Km & Vmax of an enzyme kinetics reactions | Hands on |
|      | BSc II  
Isolation of DNA from animal tissues and its quantification | Hands on |
|      | Outeclony double diffusion technique          | Hands on |
|      | Immunoelectrophoresis                        | Hands on |
|      | BSc III  
Preparation of competent cells           | Hands on |
|      | Cloning in pBR322 vector                     | Hands on |
|      | Screening of recombinant colonies by IPTG method | Hands on |
|      | BSc I  
Basics of Internet                        | Hands on |
|      | Basic Microscopy Technique                   | Hands on |
|      | BSc II  
Bioinformatics for Dummies               | Hands on |
|      | Agarose Gel Electrophoresis                  | Hands on |
|      | Bioinformatics and retrieval of sequences    | Hands on |
|      | BSc III  
Plasmid DNA Isolation & Quantification    | Hands on |
|      | Use of Graphic display tools in Bioinformatics | Hands on |
|      | Polymerase Chain Reaction                    | Hands on |
Extra Courses Conducted By the Department

[2010-2015]

E - Lectures
## E LECTURES

<table>
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<tr>
<th>Year</th>
<th>Topic of e lectures</th>
<th>Delivered by</th>
<th>Duration</th>
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<tbody>
<tr>
<td>2014</td>
<td><em>Excitement in Science</em></td>
<td>Prof. S.V. Eswaran, Distinguish Faculty &amp; Emeritus Scientist (CSIR)</td>
<td>1.5 hrs</td>
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<tr>
<td></td>
<td></td>
<td>St. Stephen College, New Delhi</td>
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<tr>
<td></td>
<td>A wandering Scientist – Do Science &amp; see the world</td>
<td>Prof. S.V. Eswaran, Distinguish Faculty &amp; Emeritus Scientist (CSIR)</td>
<td>1.5 hrs</td>
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<td></td>
<td>St. Stephen College, New Delhi</td>
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<tr>
<td></td>
<td><em>Plant Biotechnology – tools &amp; techniques</em></td>
<td>Prof. P.J. Handique, Department of Biotechnology, Gauhati University, Assam</td>
<td>1.5 hrs</td>
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<td></td>
<td></td>
<td>University College of Medical Sciences &amp; GTB Hospital</td>
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<tr>
<td></td>
<td><em>Gene &amp; Environment</em></td>
<td>Prof. B.D. Banerjee, Department of Biochemistry, University College of Medical Sciences &amp; GTB Hospital</td>
<td>2 hrs</td>
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<td></td>
<td><em>Basic of R package</em></td>
<td>Dr. Parathi Sarathi Das, Research Fellow, Bioinformatics Centre, Vidyasagar University, West Bengal India</td>
<td>2.5 hrs</td>
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<tr>
<td>2015</td>
<td><em>Accessing scholarly web resources</em></td>
<td>Dr. Lalmachhuana, Documentation Officer, NEHU Central Library, Shillong</td>
<td>1.5 hrs</td>
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<td></td>
<td><em>Sequence submission to NCBI databases</em></td>
<td>Mr. Nangkyntiew Jungai, Senior Research Fellow, Biotech Hub, St. Edmund’s College, Shillong</td>
<td>1 hrs</td>
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<td></td>
<td><em>Tutorial for using Docking analysis</em></td>
<td>Mr. Bikash Thakuria, Research Associate, Bioinformatics Centre, St. Edmund’s College, Shillong</td>
<td>1.5 hrs</td>
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Extra Courses Conducted By the Department

[2010-2015]

List of External Students Trained
# LIST OF EXTERNAL STUDENTS WHOM TRAINED BY THE DEPARTMENT

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name</th>
<th>Degree</th>
<th>University</th>
<th>Date of Joining</th>
<th>Date of Leaving</th>
<th>Duration</th>
<th>Research Topic</th>
<th>Funding Agency</th>
<th>Present Status</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Mr Baniatei Lang Dienggian</td>
<td>M.Tech (Bioinformatics)</td>
<td>JNU, New Delhi</td>
<td>1-11-2014</td>
<td>31-12-2014</td>
<td>2 months</td>
<td>Molecular dynamics simulation of azoreductase enzyme of Nostoc PCC 7120 with a variety of toxic dyes</td>
<td>DBT</td>
<td>DSP, Meghalaya Police</td>
</tr>
<tr>
<td>2</td>
<td>Mr Phiralang Diengdoh</td>
<td>MSc (Bioinformatics)</td>
<td>Kuvempu University, Karnataka</td>
<td>1-11-2014</td>
<td>31-3-2016</td>
<td>8 months</td>
<td>In silico modelling of SOD enzymes from Cyanobacteria</td>
<td>DBT</td>
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<tr>
<td>3</td>
<td>Ms Abhilasa Mehra</td>
<td>MTech (Bioinformatics)</td>
<td>Banasthali University, Rajasthan</td>
<td>1-7-2014</td>
<td>31-12-2014</td>
<td>6 months</td>
<td>In Silico based study of Metallothien protein in cyanobacteria with respect to their active sites</td>
<td>DBT</td>
<td>Pursuing PhD</td>
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<tr>
<td>4</td>
<td>Ms Sangrika Mishra</td>
<td>MTech (Bioinformatics)</td>
<td>Banasthali University, Rajasthan</td>
<td>1-7-2014</td>
<td>31-12-2014</td>
<td>6 months</td>
<td>In Silico based study on the various SOD enzymes in cyanobacteria under heavy metal stress</td>
<td>DBT</td>
<td>Pursuing PhD</td>
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<tr>
<td>5</td>
<td>Ms Dolly Sewa</td>
<td>MSc Biotechnology</td>
<td>NEHU, Shillong</td>
<td>1-01-2013</td>
<td>30-06-2013</td>
<td>6 months</td>
<td>Fingerprinting profile of Cyanobacterial strains</td>
<td>DBT</td>
<td>Pursuing PhD</td>
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<tr>
<td>6</td>
<td>Mr Jahnu Saikia</td>
<td>MSc Industrial Microbiology</td>
<td>LPU, Punjab</td>
<td>1-01-2013</td>
<td>31-03-2013</td>
<td>3 months</td>
<td>Kinetic modelling of dye absorption in cyanobacteria with response to dyes.</td>
<td>DBT</td>
<td>Pursuing PhD in IIT, Guwahati</td>
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<tr>
<td>7</td>
<td>Ms Selina Nongkhlaw</td>
<td>MSc Biotechnology</td>
<td>Bangalore University</td>
<td>1-04-2013</td>
<td>30-06-2013</td>
<td>3 months</td>
<td>Fingerprinting profile of Cyanobacterial strains</td>
<td>DBT</td>
<td>School Teacher</td>
</tr>
<tr>
<td>8</td>
<td>Mr Bikash Thakuria</td>
<td>MSc Biotechnology</td>
<td>Bangalore University</td>
<td>1-01-2013</td>
<td>30-06-2013</td>
<td>6 months</td>
<td>Functional and catalytic sites of prediction of the proteins present in Smilax aspera plant and its activity as cancer inhibitor.</td>
<td>DBT</td>
<td>Research Associate, BIF Centre, SEC</td>
</tr>
<tr>
<td>9</td>
<td>Mr Pynshngainlang Sawian</td>
<td>MSc Biotechnology</td>
<td>SHIATS, Allahabad</td>
<td>1-01-2013</td>
<td>30-06-2013</td>
<td>6 months</td>
<td>Isolation and characterization of microbes from locally available</td>
<td>DBT</td>
<td>SRF, Biotech Hub, St.</td>
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<tr>
<td>No.</td>
<td>Name</td>
<td>Qualification</td>
<td>Institute</td>
<td>Duration</td>
<td>Project Description</td>
<td>Funding Body</td>
<td>College/University</td>
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<tr>
<td>10</td>
<td>Ms Philem Priya Darshini Devi</td>
<td>MSc Biotechnology</td>
<td>NEHU, Shillong</td>
<td>1-05-2011 to 30-09-2013</td>
<td>28 Months Dyes Bioremediation using bioinformatics tools.</td>
<td>DBT</td>
<td>Pursuing PhD, Ohio State University, New Zealand</td>
<td></td>
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</tr>
<tr>
<td>11</td>
<td>Mr Harold Pyngrope</td>
<td>MSc Botany</td>
<td>NEHU, Shillong</td>
<td>1-06-2011 to 31-12-2011</td>
<td>6 Months In Silico based study on the Factor VIII &amp; IX on Haemophilia</td>
<td>DBT</td>
<td>Pursuing PhD in NUS, Singapore</td>
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<tr>
<td>12</td>
<td>Ms Ibansuklang Kharmujai</td>
<td>MSc Biotechnology</td>
<td>NEHU, Shillong</td>
<td>1-06-2011 to 31-12-2011</td>
<td>6 Months Toxicity of ruthenium on cyanobacteria and its effective bioremediation activities.</td>
<td>DBT</td>
<td>School Teacher</td>
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<td>13</td>
<td>Mr Samudra Sutradhar</td>
<td>MSc Biotechnology</td>
<td>NEHU, Shillong</td>
<td>1-08-2011 to 31-01-2012</td>
<td>6 Months Catalytic site prediction of azoreductase enzyme.</td>
<td>DBT</td>
<td>System Analyst, Invitrogen</td>
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<td>14</td>
<td>Ms Mandakini Ksoo</td>
<td>MSc Biochemistry</td>
<td>NEHU, Shillong</td>
<td>1-11-2011 to 30-04-2012</td>
<td>6 months Fingerprinting profile of Cyanobacteria strains.</td>
<td>DBT</td>
<td>Pursuing PhD, NEHU, Shillong</td>
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SWOT Analysis

[2010-2015]

Strength
Weakness
Opportunity
Threats
SWOT Analysis

STRENGTH
✓ Excellent infrastructure like cyanobacteria repository facility, Plant Tissue culture laboratory, Institutional Biotech Hub, Bioinformatics laboratory, workstation facility.
✓ Better Teacher to student ratio
✓ Student to equipment ratio (3:1)
✓ Ample availability of chemicals and glassware's to students for their practical's and project work
✓ Free internet facility to all students
✓ E-books repository facility to all students
✓ Educational trips to industries for exposure
✓ Mentoring of students
✓ Team work among the faculty.
✓ Cleaning drive by students & staff
✓ Availability of SOP for practical's sessions.
✓ ICT enabled classrooms
✓ Use of interactive board for effective teaching learning
✓ Drinking water facility
✓ Parents teacher meeting
✓ Feedback of students every year
✓ Department library facility
✓ Research facility for UG students and also motivation for publishing papers
✓ Summer training for students in reputed laboratories

WEAKNESS
✓ Non availability of high end instruments for research
✓ Dropout rate of students for higher studies
✓ Less no of sanctioned post

OPPORTUNITY
✓ Good funding from governmental agencies
✓ Unlimited internet
✓ Digitalized library
✓ Guest lectures
✓ Seminar for students
✓ Group discussions

THREATS
✓ None as such