

# Annual Report

## 2014–16

Department of Biochemistry  
Faculty of Agriculture



Uttar Banga Krishi Viswavidyalaya  
Pundibari-736165, Cooch Behar  
West Bengal, India

# UTTAR BANGA KRISHI VISWAVIDYALAYA

## FACULTY OF AGRICULTURE

P.O. Pundibari, Cooch Behar, West Bengal - 736165

**From:**  
**Prof. T.K. Hath**  
**Dean**



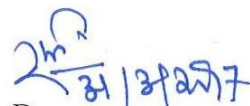
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### MESSAGE

It gives me immense pleasure to know that the Department of Biochemistry is going to publish its Annual Report for the year 2014-16. Annual Report provides information regarding major initiatives taken by the department for coordinating and maintaining standards of education at UG and PG levels, as well as achievements and future plans, different research and extension activities. The importance of department of Biochemistry has increased tremendously in the era of inter-disciplinary sciences. The department is successful in modulating and catering the regular courses of UG and PG syllabuses. The impact of teaching of this department is manifested in the excellent result of our students in ICAR-JRF and JNU Agril. Biotechnology entrance examinations respectively. It is very heartening to know that after joining of two new teachers; the department has also started offering post graduate courses (M.Sc and PhD). It is also praiseworthy that many students from other departments have been taking courses and executing their research work in this department. The teachers are also successful in bringing a few new research grants from public and private institutions to improve the infrastructure and quality of research. With the continuous support from ICAR and the state Govt. they are successful in creating several new instrumentation and infrastructural facility within this department.

During the recent years, the Faculty of Agriculture has undertaken a number of new initiatives with a view to ensuring excellence in education and the faculties and the staff have fully extended their support and involvement.

I duly acknowledge the valuable contributions made by my colleagues in bringing out the Annual Report in its present form and I do hope that that the information provided in this Annual Report will be useful for the teachers, students, researchers, administrators and stakeholders in higher education.

  
Dean,

Faculty of Agriculture

Place: Pundibari, Cooch Behar, W.B.

Date: 31st March, 2017

## **Preface**

*Department of Biochemistry under the Faculty of Agriculture has started its journey as a separate department in the year 2001 at the time of establishment of Uttar Banga Krishi Viswavidyalaya. After passing a span of one and a half decade after its establishment, this department can now boast of having a team of dedicated and energetic faculties who are striving their best to develop the department to its fullest extent.*

*From the very beginning there was provision of offering courses of Biochemistry and Agricultural Chemicals and the department is offering courses of both the subjects. Along with catering courses of under-graduate programme, the department has now started post-graduate programme including both Masters' and Ph. D. studies. A good number of students from other departments of the Faculties of Agriculture and Horticulture are taking some of the PG courses and also carrying out biochemical analysis parts of their research programmes in the laboratory of this department.*

*There have been tremendous advancements globally in the fields of both Biochemistry and Agricultural Chemicals, and the department has modified its thrust areas of research to keep pace with it. These include biochemical analysis of indigenous crop plants with special reference to enzymology, lipid biochemistry, chemical biology, molecular functioning of plant defense pathways during biotic and abiotic stresses, in-vitro propagation methods, degradation and metabolism studies of pesticides, pesticide residue analysis and presently carrying out research programmes in some of the above fields.*

*It gives me immense pleasure to be part of the programme of publishing Annual Report for the period 2014-16 in which we have attempted to present the glimpses of activities of the Department of Biochemistry during the aforesaid period.*

*At the end I acknowledge the sincere and whole-hearted efforts of the faculties and non-teaching staffs of the department whose cooperation and participation has made it possible to publish this Annual Report successfully. I express my sincere gratitude and thanks to our Hon'ble Vice-Chancellor, Dean, Faculty of Agriculture, Dean, P.G. Studies, Registrar, Deputy Registrar, Director of Research, Director of Extension Education and Comptroller for their constant encouragement and support. I also acknowledge the financial assistance received from the ICAR and other national and private funding agencies for facilitating the progress of the department.*

Date: 30.03.2017

Sd/-  
(Dr. Goutam Kr. Pandit)  
Head  
Department of Biochemistry

## Annual Report, 2014-16

### Department of Biochemistry at a Glance

#### A. Background:

After the establishment of North Bengal Campus of Bidhan Chandra Krishi Viswavidyalaya at Cooch Behar in the year 1979 biochemistry was taught under the aegis of Department of Agril. Chemistry and Soil Science. The Government of West Bengal upgraded the North Bengal Campus into a state agricultural university in the name of Uttar Banga Krishi Viswavidyalaya on February 01, 2001. From that very day the Department of Biochemistry started its journey as a separate department in this university. The Department is now manned with a team of dynamic, energetic and youthful faculties and equipped with adequate infrastructure facilities and successfully catering Master's and Doctoral degree programmes.

#### B. Functions:

- To impart teaching in Biochemistry and Agricultural Chemicals for B. Sc. (Ag.) Hons., B. Sc. (Hort.) Hons., M. Sc. (Ag.) and Ph. D. degrees.
- To carry out basic and application oriented research programmes in the fields of Biochemistry and Agricultural Chemicals.

#### C. Teaching:

##### a) Field of specialization for M.Sc. and Ph.D.:

- Biochemistry
- Agricultural Chemicals

##### b) Undergraduate courses:

###### i) Compulsory courses:

Sl. No.	Course no.	Title	Credit hours	Semester
1.	BCH 201	Biochemistry-I	2 + 1	Third
2.	BCH 301	Biochemistry-II	1 + 0	Fifth
3.	BCH 302	Agricultural Chemicals	1 + 0	Fifth

###### ii) Elective courses:

Sl. No.	Course No.	Title	Credit Hours	Semester
1.	BCH-401	Principles of Biochemistry	2+0	7 <sup>th</sup> Term Module
2.	BCH-402	Plant Metabolic pathways	2+0	7 <sup>th</sup> Term Module
3.	BCH-403	Molecular Biology of the Cell	2+0	7 <sup>th</sup> Term Module

4.	BCH-404	Analytical Techniques of Biochemistry and Molecular Biology	0+1	7 <sup>th</sup> Term Module
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**c) Post graduate courses:**

**i) Biochemistry:**

Course No.	Course Title	Credits
<b>M. Sc. (Ag.)</b>		
BCH 501	Basic Biochemistry	2+1
BCH 502	Chemistry of Biomolecules	2+1
BCH 503	Fundamentals of Enzymology	2+1
BCH 504	Analytical Techniques in Biochemistry	1+2
BCH 505	Plant Biochemistry I	2+1
BCH 506	Metabolic Pathways I	2+0
BCH 507	Molecular Biology	2+1
BCH 508	Pesticide Biochemistry	2+0
BCH 509	Basics of Immunology	2+1
BCH 510	Food and Nutritional Biochemistry	2+0
BCH 591	Master's Seminar	1+0
BCH 599	Master's Research	20
<b>Ph. D.</b>		
BCH 601	Advanced Enzymology	2+0
BCH 602	Metabolic Pathways II	2+0
BCH 603	Transport Biochemistry	2+0
BCH 604	Advanced Molecular Biology	2+0
BCH 605	Advanced Techniques in Biochemistry	0+2
BCH 606	Plant Biochemistry II	2+0
BCH 607	Current Topics in Biochemistry	1+0
BCH 608	Functional Genomics and Metabolomics	2+0
BCH 609	Environmental Biochemistry	2+0
BCH 691	Doctoral Seminar I	1+0
BCH 692	Doctoral Seminar II	1+0
BCH 699	Doctoral Research	45

**ii) Agricultural Chemicals:**

Course No.	Course Title	Credits
<b>M. Sc. (Ag.)</b>		
BCH 521	Basic Chemistry-I	2+1
BCH 522	Chemistry of Insecticides and Acaricides	2+1
BCH 523	Basic Laboratory Techniques	1+2
BCH 524	Pesticide Residue Analysis	1+1
BCH 525	Chemistry of Fungicides and Nematicides	2+0
BCH 526	Chemistry of Herbicides and PGRs	2+1
BCH 527	Chemistry of Botanicals and Biopesticides	2+0
BCH 528	Analytical Techniques in Pesticide Chemistry	2+1
BCH 529	Basic Chemistry-II	2+0
BCH 530	Pesticide Formulations	2+1
BCH 531	Movement, Degradation and Metabolism of Pesticides	2+0

BCH 591	Master's Seminar	1+0
BCH 599	Master's Research	20
<b>Ph. D.</b>		
BCH 621	Regulations and Quality Control of Pesticides	2+0
BCH 622	Advances in Insecticide Chemistry	2+0
BCH 623	Advances in Fungicide and Herbicide Chemistry	2+0
BCH 624	Practicals in Pesticide Chemistry	0+1
BCH 625	Special Topics in Agrochemicals	1+0
BCH 626	Principles of Pesticide Chemistry	2+0
BCH 627	Pesticides and Environmental Risk Assessment	2+0
BCH 691	Doctoral Seminar I	1+0
BCH 692	Doctoral Seminar II	1+0
BCH 699	Doctoral Research	45

**e) Post graduate requirement:**

- i) For M. Sc. (Ag) Degree: Four years B. Sc. (Ag)/(Hort) Hons. degree  
 ii) For Ph.D. Degree: M. Sc. (Ag) degree in Biochemistry/ Agril. Chemicals  
 iii) Students' Achievement: JRF: 2014-15: 2 in Plant Biotechnology, 2 in Plant Science, 2 in Combined Biotechnology (JNU)  
 JRF 2015-16: 5 in Plant Biotechnology, 2 in Combined Biotechnology (JNU)

SRF:                      ARS-NET:                      Others (Specify):

iv) Students' Placement: Govt:                      Cooperate:                      Bank:                      NGO:

**D. Research Activity:**

a) Areas of research :

**Biochemistry:**

- Biochemical analysis of indigenous crop plants with special reference to enzymology, lipid biochemistry, chemical biology
- Molecular functioning of plant defense pathways during biotic and abiotic stresses
- In vitro propagation methods

**Agricultural Chemicals:**

- Degradation and metabolism studies of pesticides
- Pesticide residue analysis

b) Research reports submitted : Nil

c) Awards and gold medals :

Jawaharlal Nehru Award by ICAR for best Ph. D. thesis award to Dr. Nandita Sahana

d) Scholarships, stipends and fellowships :

University Merit scholarship : 1 M. Sc. (Ag) student

URS : 1 Ph. D. student

e) On going research projects :

Development of a PCR based detection system for Potato leaf roll infection at North Bengal	P.I Dr. Nandita Sahana	Continuing
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#### E. Extension activities:

#### F. Infrastructural and Support Facilities available:

The department is having one well established UG laboratory with necessary equipments and one PG laboratory equipped with some small instruments like UV-VIS spectrophotometer, Cold centrifuge, BOD incubator, rotary vacuum evaporator, hot air oven, electronic precision balance, low speed centrifuge, gel electrophoresis system, refrigerator, hot plate, magnetic stirrer, electrical shaker, heavy duty plant grinder, water baths (ordinary & thermostatic), ultrasonic bath, extraction & Kjeldhal apparatus, vortex shaker, tissue homogenizer, melting point apparatus, UV visualization chamber.



**Instrumentation facility of Department**

#### G. Faculty and staffs:

a) Head of the Department : Dr. Goutam Kumar Pandit

b) Faculty

Sl. No.	Name	Designation	Specialization	Contact address
1.	Dr. Goutam Kumar Pandit	Associate Professor	Agricultural Chemicals, Natural products chemistry	Dept. of Biochemistry, Uttar Banga Krishi Viswavidyalaya, Pundibari-736165 Cooch Behar

2.	Dr. Somnath Mandal	Assistant Professor	Enzymology, Chemical Biology	E-mail: gkpandit@yahoo.co.in Dept. of Biochemistry, Uttar Banga Krishi Viswavidyalaya, Pundibari-736165 Cooch Behar E-mail: smandal8183@gmail.com
3.	Dr. Nandita Sahana	Assistant Professor	Molecular Biology, in vitro propagation	Dept. of Biochemistry, Uttar Banga Krishi Viswavidyalaya, Pundibari-736165 Cooch Behar E-mail: nanditasahana@gmail.com

## c) Non teaching staffs

Sl.No.	Name	Designation	Contact address
1.	Mrs. Banhi Bhattacharya	Technical Asstt. Gr II	Dept. of Biochemistry, Uttar Banga Krishi Viswavidyalaya, Pundibari-736165 Cooch Behar, West Bengal
2.	Mr. Shyamlal Sutradhar	Lab. Attendant	Dept. of Biochemistry, Uttar Banga Krishi Viswavidyalaya, Pundibari-736165 Cooch Behar, West Bengal
3.	Mr. Sohel Rana Ahmad	Junior Peon	Dept. of Biochemistry, Uttar Banga Krishi Viswavidyalaya, Pundibari-736165 Cooch Behar, West Bengal

**H. Doctoral Thesis completed: Nil**

Sl.No.	Title	Year	Author	Chairman

**I. Master Degree thesis completed: Nil**

Sl.No.	Title	Year	Author	Chairman

**J. Paper & Books published**

Sl. No.	Title	Author	Journal
<b>Paper (Research and Extension)</b>			
1.	The asparagine residue in the FRNK box of potyviral helper-component protease is critical for template function and subcellular localization	<b>Nandita Sahana</b> , Harpreet Kaur, R. K. Jain, Peter Palukaitis, Tomas Canto, Shelly Praveen	<i>Journal of General Virology</i> , <b>2014</b> , 95: 1167-1177
2.	Garcinol sensitizes human head and neck carcinoma to cisplatin in a xenograft mouse model despite downregulation of proliferative biomarkers	Li F, Shanmugam M K., Siveen K S, Wang F, Ong T H, Loo S Y, Swamy MM, <b>Mandal S</b>	<i>Oncotarget</i> , <b>2015</b> , 6 (7): 5147-63
3.	Naphthoquinones Mediated Inhibition of Lysine Acetyltransferase KAT3B/p300, Basis for Non-toxic Inhibitor Synthesis	Vasudevarao M.D., Mizar P, Kumari S, <b>Mandal S</b> , Siddhanta S, Swamy M.M.,	<i>Journal of Biological Chemistry</i> , <b>2014</b> , 289, 7702-7717



		Kaypee S, Ravindra K.C, Banerjee A, Narayana C, Dasgupta D, and Kundu T.K.	DOI:10.1074/jbc.M113.486522
4.	In vitro kinetics of soybean lipoxygenase with combinatorial fatty substrates and its functional significance in off flavour development	<b>Mandal S</b> , Dahuja A, Kar A and Santha I.M.	<i>Food Chemistry</i> , <b>2014</b> , 146, 394-403. DOI.org/10.1016/j.foodchem. 2013.08.100
5.	Lipoxygenase activity in soybean is modulated by enzyme-substrate ratio	<b>Mandal S</b> , Dahuja A, and Santha I. M.	<i>Journal of Plant Biochemistry and Biotechnology</i> , <b>2014</b> , 23(2), 217-220. DOI 10.1007/s13562-013-0203-0
6.	Antagonism Between LOX-pathway Enzymes and Antioxidative Molecules –a Potential Gateway for Flavour Quality Improvement in Soybean	<b>Mandal S</b> and Santha I. M.	<i>Journal of Agriculture and Technology</i> , <b>2016</b> , 3 (1): 30-39
7.	Efficacy of imidacloprid against <i>Singhiella pallida</i> Singh and dynamics of its dissipation in/on <i>Piper betle</i> L. leaves	Dhar, T., Senapati, S. K., <b>Pandit, G.</b> and Bhattacharya, S.	<i>The Ecoscan</i> , <b>2014</b> , 8 (3 & 4), 301-304
8.	Variation in the formation of some biomolecules in cabbage ( <i>Brassica oleracea</i> L. var <i>capitata</i> ) leaf induced by endosulfan	Ashrafi, M. A. and <b>Pandit, G. K.</b>	<i>The Bioscan</i> , <b>2015</b> , 10 (2), 539-543
9.	Effect of light intensity on different betelvine germplasm under Terai region of West Bengal	Bhutia, N., Medda, P.S., Choudhuri, P., Ghosh, A. and Pandit, G.	<i>The Bioscan</i> , <b>2015</b> , 10 (3), 1163-1168
10.	Bio-efficacy evaluation and residue analysis of Tricyclazole 75% WP in paddy against blast disease	Bandyopadhyay, S., Poddar, P. and <b>Pandit, G. K.</b>	<i>International Journal of Recent Scientific Research</i> , <b>2015</b> , 6 (11), 7254-7258
11.	Photodegradation of metribuzin in sunlight sensitized by TiO <sub>2</sub>	Ashrafi, M. A. and <b>Pandit, G. K.</b>	<i>Pesticide Research Journal</i> , <b>2015</b> , 27 (2): 175-179
12.	Effect of preharvest bunch spray of mineral nutrients on yield and quality of banana ( <i>Musa paradisiaca</i> ) var. Grand Naine	Bhanu Sree, M.R., Ghosh, S.K., Chakravarty, S., <b>Pandit, G.K.</b> , Mukhopadhyay, D., Medda, P.S. and Ravi Kumar, K.	<i>Progressive Research – An International Journal</i> , <b>2015</b> , 10 (Special-IV): 2153-2155
13.	Effect of imidacloprid on the activities of some enzymes of cabbage ( <i>Brassica oleracea</i> L. var. <i>capitata</i> ) leaf	Ashrafi, M. A. and <b>Pandit, G. K.</b>	<i>International Journal of Recent Scientific Research</i> , <b>2016</b> , 7 (1): 8232-8235

<b>Book Chapter</b>			
	Emerging Epigenetic therapies : Lysine acetyl transferase inhibitors	Stephanie Kaypee, <b>Somnath Mandal</b> , Snehajyoti Chatterjee and Tapas K. Kundu	Epigenetic Cancer Therapy (2015), Steven Gray Edited
<b>Book</b>			

**K. Seminar, Symposium, Conference, Training and Winter/Summer/Refresher course/short course attended/organized**

<b>Sl. No.</b>	<b>Seminar, Symposium, Conference, Training and Winter/Summer/Refresher course/short course</b>	<b>Faculty associated</b>	<b>Date</b>	<b>Venue</b>	<b>Attended /Organised</b>
1.	National symposium on “Advances in Plant and Microbial Researches” [PLAMIREs]	S. Mandal & N. Sahana	Dec. 12-13, 2014	NBU, Siliguri	Attended
2.	National symposium of Indian Virological Society	N. Sahana	Dec.7, 2015	IARI, New Delhi	Attended
3.	International Seminar on "Prioritizing Integrating Agriculture & Allied Research: Future Potentials for Secure Livelihoods" (ISIAAR)	G. K. Pandit	Nov. 6-9, 2014	BCKV, Kalyani	Attended
4.	National Symposium on ‘Agrochemicals for Food and Environment Safety’	G. K. Pandit	Jan 28-30, 2015	IARI, New Delhi	Attended

**L. Any other (Achievement) : Nil**

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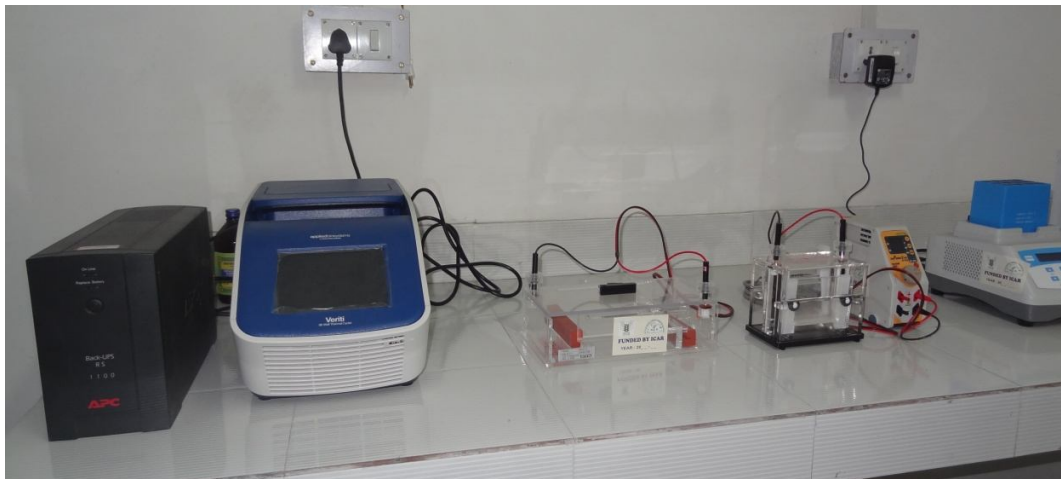
Mid-Term examination of the courses of the department



Practical classes of UG courses



Ph. D. student Mr. Sayan Chowdhury presenting his synopsis seminar



(a)



(b)





(c)

Sophisticated instrumentation facility of the department - Figures (a) to (c)



Some other instruments of the department

