

NAAC

EVALUATIVE REPORT

OF

DEPARTMENT OF
BIOCHEMISTRY

DECEMBER 2014 – DECEMBER 2015



UNIVERSITY OF DELHI

Evaluative Report

Department of Biochemistry

1. **Name of the Department** : Biochemistry
2. **Year of establishment** : 1984
3. **Is the Department part of a School/ Faculty of the University?** : Faculty of Interdisciplinary & Applied Sciences (FIAS)
4. **Names of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.)**

PG Programme - M.Sc. Biochemistry
M.Phil. (Biotechnology)
In collaboration with other departments of FIAS

Doctoral Programme - Ph.D. Biochemistry

5. **Interdisciplinary programmes and departments involved:**

- i) **The teachers from the department are involved in teaching the following interdisciplinary courses to M.Sc. students of other departments;**

S. No.	Interdisciplinary Paper	Other Department involved
1.	Protein – Structure, folding and engineering	Department of Plant Molecular Biology & Biotechnology (PMBB)
2.	Enzyme and Techniques in Biochemistry	Department of Microbiology

- ii) **The teachers from the department are also involved in teaching course to Ph.D./M.Phil students of other departments**

S. No.	Name of the Course	Department involved
1.	Ph.D./M.Phil.	Department of Plant Molecular Biology & Biotechnology (PMBB) Department of Genetics Department of Microbiology Department of Biophysics

6. **Courses in collaboration with other Universities, industries, foreign institutions etc.** : None

7. **Details of programmes discontinued, if any, with reasons** : None

8. Examination System: Annual/Semester/Trimester/Choice Based Credit System –

S. No.	Name of the Course	Type of Examination
1.	M.Sc. Biochemistry	Semester System
2.	M.Phil. (Biotechnology)	Semester System
3.	Ph.D. (Biochemistry)	Course work – Semester system

9. Participation of the department in the courses offered by other departments:-

- i) **The M.Sc. students from the Department of Biochemistry take the following interdisciplinary courses offered by the other Departments:**

S. No.	Name of the Paper	Name of the Dept. teaching the course
1.	Microbial Pathogenicity	Department of Microbiology
2.	Introduction to Bioinformatics	Department of Plant Molecular Biology & Biotechnology (PMBB).

- ii) **The Ph.D./M.Phil students from the Department of Biochemistry take up courses in other Departments viz. PMBB, Microbiology and Biophysics**

S. No.	Name of the Paper	Name of the Dept. teaching the course
1.	Microbial Pathogenicity	Department of Microbiology
2.	Introduction to Bioinformatics	Department of Plant Molecular Biology & Biotechnology (PMBB)
3.	Immunology	Department of Microbiology
4.	Computer Applications in Biology	Department of Biophysics

10. Number of teaching posts sanctioned, filled and actual (Professors/AssociateProfessors/Asst. Professors/others) (December 2014 – December 2015)

	Sanctioned	Filled	Actual (including CAS & MPS)
Professor	-	-	06
Associate Professors	-	01	01
Asst. Professors	-	01	02

11. Faculty profile with name, qualification, designation, area of specialization, experience and research under guidance

Name	Qualification	Designation	Specialization	No. of Years of Experience	No. of Ph.D./M.Phil. students guided for the period (Dec. 2014 – Dec. 2015)
Prof. Anil K. Tyagi	M.Sc., Ph.D.	Professor	Tuberculosis with special reference to the development of new TB vaccines and drug discovery against TB	35Years	1 awarded 1 submitted 4 continuing
Prof. Vijay K. Chaudhary	M.Sc., Ph.D.	Professor	Development of novel reagents for diagnostic test for infectious diseases using state-of-the-art protein engineering technologies including human antibodies.	29 Years	2 awarded 3 continuing
Prof. Prahlad C. Ghosh	M.Sc., Ph.D.	Professor	Drug Delivery using Liposomes and Nanoparticles as Carriers.	29 Years	1 awarded 2 submitted 6 continuing
Prof. Debi P. Sarkar	M.Sc., Ph.D.	Professor	HOST-VIRUS Interactions/Molecular Cell Biology/ Virology	27Years	1 continuing
Prof. Suman Kundu	M.Sc., Ph.D.	Professor	Structure-Function Relationship and Protein Engineering in Hemoglobins and Artificial Blood Substitutes; Diagnosis of Hemoglobinopathies; Rational Drug Design (Hypertension, Cancer, Malaria)	10Years	Ph.D– 2 awarded, 7 continuing, M.Phil – 1 continuing
Prof. Alo Nag	M.Sc., Ph.D.	Professor	Molecular mechanisms of cellular transformation during oncogenesis and discovery of novel therapeutic	8 Years	2 awarded 2 submitted 5 continuing

			targets against cancer.		
Dr. Amita Gupta	M.Sc., Ph.D.	Associate Professor	Deciphering the role of TA loci in M. tuberculosis; development of expression systems for functional genomics	9 Years	2 continuing
Dr. Suneel Kateriya	M.Sc., Ph.D.	Assistant Professor	Molecular basis of the rhodopsin mediated signaling, Optogenetics, Channelopathy and Ciliopathy	8 Years	1 submitted 1 continuing
Dr. Garima Khare	M.Sc., Ph.D.	Assistant Professor	Drug discovery against tuberculosis and understanding the host pathogen interactions in tuberculosis	1 year	-

12. **List of Senior Visiting Fellows, adjunct faculty, emeritus professors** : None

13. **Percentage of classes taken by temporary faculty – programme-wise information** : None

14. **Programme-wise Student Teacher Ratio:**

S.No.	Programme	Student Teacher Ratio
1.	M.Sc. Biochemistry	3:1
2.	Ph.D. Biochemistry	5:1

15. **Number of academic support staff (technical) and administrative staff: sanctioned, filled and actual**

Category	Sanctioned	Filled	Actual
Administrative	-	-	1
Technical	-	-	2
MTS	-	-	1

These posts have been sanctioned faculty-wise and not department-wise

16. **Research thrust areas as recognized by major funding agencies:**

- Diagnostics, prophylactics and therapeutics for infectious diseases with emphasis on Tuberculosis
- Drug delivery using virosomes, liposomes and nanoparticles as carrier for the treatment of infectious diseases.

- Basic understanding of the molecular mechanisms of oncogenesis and discovery of novel anti-cancer therapeutic strategies.
- Photosignalling, optogenetics, channelopathies and ciliopathies
- Mechanistic understanding of novel hemoglobins, diagnostics for hemoglobinopathies and rational drug design for cardiovascular diseases and cancer

17. Number of faculty with ongoing projects from a) national b) international funding agencies and c) Total grants received. Give the names of the funding agencies, project title and grants received project-wise. (December 2014 – December 2015)

a) National

Name of the funding Agencies:

Department of Biotechnology (DBT), Government of India

UGC-DAE Consortium of Scientific Research

Department of Science and Technology (DST), Government of India

Indian Council of Medical Research (ICMR), India

Council of Scientific and Industrial Research (CSIR), India

Prof. Anil K. Tyagi

A Virtual Centre of Excellence for Co-ordinated Research on Tuberculosis : Development of Alternate Strategies (September 2011 to September 2016)	DBT	Ongoing	Rs. 484.77 lakhs
Development and evaluation of an α -crystallin based prime boost vaccination strategy against TB by employing MVA (May 2012 to November 2015)	DBT	Ongoing	Rs. 80.89 lakhs

Prof. Vijay K. Chaudhary

Development for reagents for simple immunochemical tests for the detection of Chikungunya infection (May, 2014- May 2017)	DBT	Ongoing	Rs. 86.4 lacs
DNA Sequencing facility at UDSC (Phase V) (June 2014- June 2017)	DBT	Ongoing	Rs. 114.26 lacs

Prof. Prahlad C. Ghosh

Innovative strategies for developing Diagnostics and Therapeutics to combat Infections (November 2014 to October 2019)	DU DST-Purse	Ongoing	22.50 lacs
Evaluation of soya phosphatidylcholine-stearylamine liposome as anti-malarial agent. (April 2014 to March 2017)	ICMR	Ongoing	25.00 lacs

Prof. Debi P. Sarkar

Centre of Excellence for Research on Hepatitis C Virus – Phase II (September, 2013- September 2016)	DBT	Ongoing	Rs.40.12lacs
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Prof. Suman Kundu

Development of potent small molecule inhibitors against dopamine beta-hydroxylase to combat cardiovascular diseases (June 2015- June 2018)	DBT	Ongoing	Rs. 78,90, 300 /-
Understanding the structure of Leishmania major phosphopantetheinyl transferase (LmjPPTase) and its interaction with cognate ACP	UGC-DAE	Ongoing	Rs. 7.902 lacs

Dr. Amita Gupta

Identification and characterization of promoters of toxin antitoxin loci in <i>Mycobacterium tuberculosis</i> (October 2014 – September 2017)	CSIR	Ongoing	Rs.35.0 lacs
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Dr. Suneel Kateriya

Engineering of Photoactivated Adenylate Cyclase (PAC) for the Development of Optogenetic Tools for Neuroscience Applications	2012-2015	DBT	46 lakhs
Functional characterization of new photoreceptor proteins and ion channels in the microalga <i>Chlamydomonas reinhardtii</i> using functional genomics methods. DST-India-RFBR-Russia (2014-16)	2014-2016	DBT-RFBR (Indo-Russia)	25 lakhs
Photo-dynamic, Biochemical and Optogenetic Characterization of the Novel Bacterial Photoactivated Adenylate Cyclase	2013-2017	DST-SERB	46 lakhs

Dr. Garima Khare

Understanding the VirS mediated acid induced responses of <i>Mycobacterium tuberculosis</i> in maintaining the pH homoeostasis <i>in vitro</i> and in host (August 2014 – August 2017)	DBT	Ongoing	Rs. 50.0 lacs
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b) **International** None

c) **Total Grant Received:** 1142.742 lacs

18. Inter-institutional collaborative projects and associated grants received (December 2014 – December 2015)

(a) National collaboration

Name of the Faculty	Collaborated Agency
Prof. Vijay K. Chaudhary	Development for reagents for simple immunochemical tests for the detection of Chikungunya infection. ICMR Virus Research Unit, Kolkata and IIIT, Noida.

(b) International Collaboration

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19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, AICTE, etc.; total grants received. (December 2014 – December 2015)

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20. Research facility / centre with

S. No.	Research Facility	Centre with
1.	State recognition	None
2.	National recognition	DBT supported DNA Sequencing Facility DBT supported Distributed Information Sub-Centre
3.	International recognition	None

21. Special research laboratories sponsored by / created by industry or corporate Bodies:

None

22. Publications (December 2014 – December 2015)

Nature of information	Total
Number of papers published in peer reviewed journals (national/international)	17
Monographs	None
Chapters in Books	None
Books edited	None
Books with ISBN with details of publishers	None
Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, Google Scholar etc.)	17
Citation Index – range / average	Range: 16-80 Average: 38.66
SNIP	-
SJR	-
Impact Factor – range / average	Range:0.65 – 4.89 Average:~ 2.982 (per journal)
h-index	Range: 10-18 Average: 13.33 (per faculty)

Details at Annexure – I. Annexures/Appendices do not form part of this document as per NAAC guidelines. It will be presented before the Peer Team on their visit to the University.

23. Details of patents and income generated (December 2014 – December 2015)

Income Generated

-

Details of Patents

-

24. Areas of consultancy and income generated (December 2014 – December 2015)

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25. Faculty selected nationally / internationally to visit other laboratories /institutions / industries in Indiaand abroad (December 2014 – December 2015)

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26. Faculty serving in

a) National committees

Prof. Anil K. Tyagi

- Member, Scientific Advisory Group, Translational Health Science and Technology Institute (THSTI), Udyog Vihar, Gurgaon from 2010 onwards.
- Member, APEX Committee, Vaccine Grant Challenge Programme, Department of Biotechnology, Government of India, New Delhi from 2011 onwards.
- Member of Expert Committee for North Eastern Region Biotechnology Programmes, Department of Biotechnology, Government of India, 2009 onwards.
- Member, Academic Committee, Translational Health Science and Technology Institute, Gurgaon from August 2013 onwards.
- Member, Academic Committee, National Institute of Immunology, New Delhi from 2013 onwards.

Prof. Vijay K. Chaudhary

- Member, Task Force on DBT-Boost to University Interdisciplinary Life Sciences for Education and Research (DBT-BUILDER) Department of Biotechnology, Government of India, New Delhi, 2009 onwards.
- Member, Committee for Innovative Young Biotechnologists Award, Department of Biotechnology, Government of India, New Delhi, 2005 onwards.
- Member, Expert Committee(DBT-ICMR) on HIV, AIDS and Microbicides, Department of Biotechnology, Government of India, New Delhi, 2010 onwards.

Prof. Prahlad C. Ghosh

- Invited as a member of the UGC Expert Committee Meeting for finalizing Under Graduate Courses Syllabi under Choice based credit System (CBCS), held on June 22, 2015 at South Campus, Delhi University, New Delhi-110021.
- Member, Research Review Committee (RRC), National Dope Testing Laboratory w.e.f. October 09, 2-14
- Member, Doctoral Committee, Indira Gandhi National Open University (IGNOU), New Delhi
- Member, Doctoral committee, JNU, New Delhi.

Prof. Debi P. Sarkar

- Member of the Special Committee of Center for Biotechnology, JNU, New Delhi.
- Member of the Academic Committee of ICGEB, New Delhi.
- Member of the Special Committee of SLS, JNU, New Delhi.
- Member of the Task Force on Fast Track Project, DST, New Delhi.
- Member, Academic Council, Delhi University, Delhi
- Member, Task Force, RCGM, DBT, New Delhi
- Member, Thematic-Group on “National S&T Human Resource Development”, CSIR, for the formulation of Eleventh Five Year Plan.
- Member, of the Academic Committee of CCMB (CSIR), Hyderabad

- Member, of the Academic Committee of IMTECH (CSIR), Chandigarh
- Member, of the RC of CIMAP (CSIR), Lucknow
- Member, Planning and Monitoring Board of National Brain Research Centre (NBRC, DBT), Manesar, Gurgaon
- Expert Member, RAB/CSIR
- Member, Standing Committee on Recognized Research Institute, JNU
- Member, Course committee, IISER, Mohali, Chandigarh
- Member of the expert committee of CSIR Eng-42 RA/SRF selection
- Co-Convenor CSIR/UGC NET Examination Board
- Expert Member of the task force of “Animal Science Committee”, CSIR
- Elected Member, NII Finance Committee
- Member Task Force of DBT, Bio-Care
- Member Task Force of IYBA, DBT
- Member Research Council, ICPO (ICMR)

Prof. Suman Kundu

- Special Academic Committee Member, Special Center of Molecular Medicine, JNU,
- Executive Council Member, Proteomics Society, India
- National Organizing Committee Member, 6th World Congress on Biotechnology, October 5-7, 2015, Crowne Plaza, Rohini, New Delhi, India

b) **International committees** : None

c) **Editorial Boards**

Prof. Anil K. Tyagi

- Academic Editor, PLoS ONE from 2009 onwards, published by Public Library of Science.
- Member of Editorial Advisory Board for the journal Tuberculosis from 2012 onwards published by Elsevier Press.
- Member of the Editorial Board for the Journal “Indian Journal of Medical Research” published by ICMR, New Delhi, 2003 onwards.

Prof. Debi P. Sarkar

- Elected member of the editorial board of Indian Journal of Biochemistry and Biophysics.
- Member, Editorial Board of “Human Gene Therapy”, MaryAnn Liebert Inc. Publishers, A Journal of European Society for Gene and Cell Therapy w.e.f. August 2009

Prof. Suman Kundu

- Editor-in-Chief, Journal of Proteins and Proteomics, India

Prof. Alo Nag

- Member of the Editorial Board for the Journal “Current Trends in Biotechnological and Chemical Research” India.
- Associate Board member, Journal of Proteins and Proteomics, India.

Dr. Suneel Kateriya

- Editorial Board Member, Advances in Applied Research Journal

d) Any other

Prof. Anil K. Tyagi

- Reviewer of research grant proposals for Wellcome Trust, CSIR, DBT and DST, Govt. of India.
- Regular reviewer for papers from the journals such as PLoS ONE, Indian Journal of Medical Research, Vaccine.

Prof. Debi P. Sarkar

- Reviewer of research grant proposals for CSIR, DBT and DST, Govt. of India.
- Reviewer of research papers from FEBS Letters, Molecular Pharmaceutics (USA), Molecular Membrane Biology (USA), BioTechniques (USA), Antiviral Research (Belgium), Archaea (Canada), PDA Journal of Pharmaceutical Science and Technology (USA), International Medical Journal for Experimental and Clinical Research, Poland (USA), BBA-Biomembrane, Journal of Infectious Diseases, Nanotechnology and Langmuir.

Prof. Suman Kundu

- Reviewer of research grant proposals for CSIR, DBT and DST, Govt. of India.
- Reviewer of research papers for PLoS One, FEBS Letters, Indian Journal of Biotechnology, Cell and Developmental Biology, Journal of Agriculture and Food Chemistry, Applied Biochemistry and Biotechnology; Letters in Drug Design and Discovery, F1000 Research, Journal of Proteomics
- Advisory Committee Member, P.G. Diploma Course in Molecular and Biochemical Technology, Sri Venkateswara College, Delhi University,
- University Representative on the Governing Body of Acharya Narendra Dev College, Delhi University,
- Judgment (member of Jury) of KVS National level Science Exhibition under INSPIRE Programme launched by Dept. of Science & Technology {DST} at Kendriya Vidyalaya, INA Colony.

- External Expert of Faculty Re-designation Committee, TERI University, Vasant Kunj, New Delhi, Promotion to Associate Professor from Assistant Professor
- Local Organizing Committee Member and Judge, Poster Session, National Symposium on Biophysics and Golden Jubilee Annual Meeting of IBS, 50th year of Indian Biophysical Society, Feb 14-17, 2015, Jamia Millia Islamia, New Delhi.

Prof. Alo Nag

- Reviewer of research grant proposals for CSIR, DBT and DST, Govt. of India.
- Reviewer of research papers from Molecular Cancer (USA), eCancer (UK), PLoS One, PLASMID (USA), Current Cancer Drug Targets (USA), Genetics Research International (USA) and Molecular Cancer Biology (USA).

Dr. Amita Gupta

- Reviewer of research grant proposals for DBT and DST, Govt. of India.
- Reviewer of research papers for PLoS ONE, Indian Journal of Microbiology, Microbiology, BMC Microbiology.

Dr. Suneel Kateriya

- Reviewer of research papers from New Phytologist, PloS One, Indian Journal of Microbiology, Journal of Applied Phycology, International Journal of Photoenergy.

Dr. Garima Khare

- Reviewer of research papers for PLoS ONE, Journal of Antimicrobial Chemotherapy and Molecular Biosystems.

27. Faculty recharging strategies (UGC, ASC, Refresher / orientation programs, workshops, training programs and similar programs). (December 2014 – December 2015)

-

28. Student projects

- **Percentage of students who have done in-house projects including inter-departmental projects** : 100%
- **Percentage of students doing projects in collaboration with other universities / industry / institute** : None

29. **Awards / recognitions received at the national and international level by (December 2014 – December 2015)**

Faculty

Prof. Vijay K. Chaudhary

- 2014, Biotech Product and Process Development and Commercialization Award, Department of Biotechnology, Government of India.
- Best Innovation award 2014 by Hon'ble President of India given in Feb, 2015

Prof. Prahlad C. Ghosh

Awarded Prof. M.L. Khorana Memorial Prize on June 05, 2015 by the Indian Pharmaceutical Association (IPA) for publishing best paper in the field of Pharmacology & Clinical Pharmacy in IJPS for the year 2013.

Dr. Amita Gupta

Best Innovation award 2014 by Hon'ble President of India given in Feb, 2015

Doctoral / post doctoral fellows

- **Swati Singh**, Garima Khare and Anil K. Tyagi, (2015). Identification of biotin biosynthesis inhibitors for inhibition of *Mycobacterium tuberculosis*. Poster presented at 5th National Science Day Symposium, 27th-28thFebruary, 2015, University of Delhi South Campus, New Delhi. **Best poster award.**
- **Boehringer Ingelheim Fonds (BIF) Travel Grant Award** to **Sanjay Kumar Dey** (2015) for Short Term Research Work in Germany.
- **Travel Grant from ICMR, DST, Immunology Foundation** to **Sanjay Kumar Dey** to attend Conference on Hypertension by Council of Hypertension and American Heart Association, USA, 2015.
- **Young Scientist Fellow**, American Heart Association, 2015, **Sanjay Kumar Dey**
- **Sanjay Kumar Dey** (2015) 12th Annual Conference of International Society for Heart Research (Indian Section), 14th-15th March, 2015, Jawaharlal Nehru University, New Delhi, India. **Selected among the best five posters.**
- **Richa Arya**, (2015) 5th National Science Day Symposium, 27th-28thFebruary, 2015, University of Delhi South Campus, New Delhi. **Third Best Oral Presentation Award**
- **Sanjay Kumar Dey**, (2015) Cardiovascular Research Convergence 2, 17th January, 2015, All India Institute of Medical Sciences, New Delhi, India. **Best Poster Award**

- **Neha Jaiswal**, Pradeep Singh Cheema, Rince John, Vaibhav Chand and Alo Nag (2015). “Viral oncoprotein HPV16E7 perturbs SUMOylation of FoxM1 to induce oncogenesis” in International Symposium Current Advances in Radiobiology, Stem Cells and Cancer Research, 19th-21st Feb, 2015, JNU, New Delhi. *The first author received the Best Poster Award.*

30. Seminars/ Conferences/Workshops organized and the source of funding (national/international) with details of outstanding participants, if any: (December 2014 – December 2015)

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31. Code of ethics for research followed by the departments:

- The students and faculty members observe very high standards in respect of ethics for publication, use of animals for research, biosafety etc. Any project involving radioactivity is monitored by departmental radiation safety officer. Every departmental member is regularly exposed to procedures to safeguard any type of malpractices.
- All the laboratory supervisors ensure that the research work undertaken under their guidance and supervision is original. They also ensure that the work is carried out by the student(s) themselves. For writing the thesis/reports/scientific manuscripts the supervisors ensure that these are original writings. Plagiarism is avoided at all costs using appropriate softwares and alertness by supervisors.
- It is also ensured that all research projects are routed through appropriate committees like Institutional Bio-safety Committee (IBSC) & Animal ethics committee and Institutional Ethics Committee.
- The supervisors ensure that Good Microbiological Practices (GMP) and Good Laboratory Practices (GLP) are followed during research including the P3 level containment practices as and when appropriate.

32. Student profile programme-wise: (December 2014 – December 2015)

Name of the Programme (refer to question no. 4)	Applications received	Selected		Pass percentage	
		Male	Female	Male	Female
M.Sc. Biochemistry	255	0	12	100%	100%
M.Phil. Biotechnology*	41	01	05	N/A	N/A
Ph.D. Biochemistry ^{&}	N/A	0	03 [§]	N/A	N/A

**In collaboration with other departments of FIAS[§] Enrolled during December 2013 – November 2014. [&]Currently, there is no annual or biannual system. As per the existing ordinance VIB, students with fellowship are enrolled directly, and those with fellowship in the project are interviewed before enrollment.*

33. Diversity of students: (December 2014 – December 2015)

Name of the Programme	% of students from the same university	% of students from other universities within the State	% of students from universities outside the State	% of students from other countries
M.Sc. Biochemistry	100%	0%	0%	0%
M.Phil. Biotechnology	66.66%	0%	33.33%	0%
Ph.D. Biochemistry	14.28%	42.86%	42.86%	0%

34. How many students have cleared Civil Services and Defence Services examinations, NET, SLET, GATE and other competitive examinations? Give details category-wise. (December 2014 – December 2015)

NET : 08

Other competitive examinations:

CSIR : 07
 ICMR : 0
 DBT : 0
 UGC : 01
 DST : 0
 GATE : 06

35. Student progression:

Student progression	Percentage against enrolled
UG to PG	8% join DU; remaining go to other Universities
PG to M.Phil.	Not Applicable
PG to Ph.D.	20% join DU; remaining go to other National & International Institutions
Ph.D. to Post-Doctoral	20-25%
Employed • Campus selection • Other than campus recruitment.	Not Applicable 100%
Entrepreneurs	5%

36. Diversity of staff:

Percentage of faculty who are graduates	
of the same university	40%
from other universities within the State	Nil
from universities from other States	60%
from universities outside the country	Nil

37. **Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment Period** : Not applicable

38. **Present details of departmental infrastructural facilities with regard to**

- a) **Library** : Departmental library receives 10 journals and has a collection about 200 books which are primarily used by M.Sc. students
- b) **Internet facilities for staff and students** : All research laboratories, M.Sc. laboratories and classrooms and office are equipped with Internet Facilities
- c) **Total number of class rooms** : Two
- d) **Class rooms with ICT facility** : The classrooms are equipped with Desktop Computers, Internet Facilities and LCD Projectors
- e) **Students' laboratories** : M.Sc. laboratories are equipped with modern instruments, Desktop Computer, overhead Projectors and Internet Facilities and have work benches to carry out experiments
- f) **Research laboratories** : Research laboratories are equipped with various instruments related to specialization of the laboratories. All laboratories have state-of-art research facilities

39. **List of doctoral, post-doctoral students and Research Associates (current)**

- a) **from the host institution/university** : 07
- b) **from other institutions/universities** : 29

List of doctoral and post-doctoral students (as on 31st December 2015)

Prof. Anil K. Tyagi

Doctoral

1. Ritika Kar
2. Akshay Rohilla
3. Swati Singh
4. Shubhita Mathur
5. Shingar Sharma (Submitted)
6. Prachi Nangpal (Submitted)

Prof. Vijay K. Chaudhary

Doctoral

1. Vaishali Verma
2. Payal Grover (Submitted)
3. Kapil Mathur
4. Charanpreet Kaur (Submitted)
5. Juhi Khurana

Prof. Prahlad C. Ghosh

Doctoral

1. Pooja Tiwari
2. Deepa Jha
3. Vandana
4. Vinoth Rajendran
5. Mohsin Raza
6. Shivani Sharma
7. Swati Singh

Prof. Debi P. Sarkar

Doctoral

1. Sunandini Chandra

Prof. Suman Kundu

Doctoral

1. Richa Arya
2. Sanjay Kumar Dey
3. Pushpanjali Dasauni
4. Gaurav Kumar
5. Asim Khan
6. Manisha Saini
7. Sanjeev Kumar Yadav

Prof. Alo Nag

Doctoral

1. Pradeep Singh Cheema
2. Yama Atri
3. Simran Kaur
4. Neha Jaiswal (Submitted)
5. Pallavi Singhal (Submitted)

Dr. Amita Gupta

Doctoral

1. Nidhi Gupta
2. Juhi Khurana

Post-doctoral

1. Kalpana Sagar

Dr. Suneel Kateriya

Doctoral

1. Meenakshi Tanwar (Submitted)
2. Komal Gaur

40. Number of postgraduate students getting financial assistance from the university : 12

41. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology (December 2014 – December 2015)

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42. Does the department obtain feedback from

a. faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?

The feedback of the faculty on curriculum is sought during the departmental meetings which are held almost every month. This is taken into account while the course revision is undertaken.

b. students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?

The feedback of the students on curriculum is undertaken during discussions with the students especially during the project presentation by the final year students which are more mature and are ready to give good advice based on their experience to improve the syllabus and teaching methodology. This is taken into consideration during the curriculum revision.

c. alumni and employers on the programmes offered and how does the department utilize the feedback?

The alumni who are employed to teach Biochemistry course at undergraduate level in the Delhi University colleges regularly give feedback for improvement/revision of the curriculum.

43. List the distinguished alumni of the department (maximum 10)

Name	Designation	Address
Dr. Murali D. Bashyam	Scientist	CDFD, Hyderabad
Dr. Ashima Kushwaha	Asstt. Professor	Indian Institute of Scientific Research, Gandhinagar
Dr. Deepak Kaushal	Professor	Tulane National Primate Research Center, USA
Dr. Sanjay Gupta	Assoc. Professor	Jaypee Institute of Information Technology, NOIDA, UP
Dr. Sandeep Saxena	Scientist	NII, New Delhi
Dr. Seemha Rai	Asstt. Professor	Panjab University
Dr. Vivek Rao	Asstt. Professor	Institute of Genomics and Integrative Biology, Mall Road, Delhi
Dr. Siddhartha Jana	Assoc. Professor	Dept. of Biological Sciences, Indian Association of Cultivation of Science, Kolkata
Dr. Ramandeep Singh	Asstt. Professor	THSTI, Gurgaon
Dr. Amit Singh	Asstt. Professor	IISC, Bangalore
Dr. Nisheeth Agrawal	Asstt. Professor	THSTI, Gurgaon

44. Give details of student enrichment programmes (special lectures / workshops /seminar) involving external experts. (December 2014 – December 2015)

Name of External Experts	Designation& Address	Subject of Lecture
Dr. M. Brunori	Professor and Distinguished Scientist, University of Rome, Italy	Morphogenesis of Proteins

45. List the teaching methods adopted by the faculty for different programmes.

Teaching is carried out by a combination of the following:

- PowerPoint lectures by teachers
- Interactive discussion with students during the lectures
- Periodic question-answer sessions during the classrooms teaching
- Writing assignments given to students
- Seminars by the students

46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?

That the programme objectives are met is ensured by:

- Taking feedback from the students
- Periodic evaluation of the students
- Monitoring the performance of the students during examinations
- Departmental meetings

47. Highlight the participation of students and faculty in extension activities:

The faculty members regularly visit colleges of the University for interacting with undergraduate students, deliver lectures and seminars and teach specialized courses. The faculty members also deliver lectures in different institutions across the country. They also participate in workshops and share their research work in symposium and conferences.

The students of the department present posters and oral presentations in various national and international conferences. Senior students enrolled in post-graduate programme of University department visit their respective colleges to interact with their juniors.

48. Give details of “beyond syllabus scholarly activities” of the department.

1. Participation of the students in lectures/ seminars delivered by external experts in the department as well as in other departments.
2. Mandatory participation of the students in all Pre-Ph.D. seminars and Ph.D. *viva-voce* examinations in the department.
3. Participation of the students in activities like poster presentations, quiz, collage etc. during the science day function.
4. Participation of the students in seminars/workshops conferences being organized in the department.

49. State whether the programme/ department is accredited/ graded by other agencies? If yes, give details

No

50. Briefly highlight the contributions of the department in generating new knowledge, basic or applied.

One of the commendable contributions of the department has been the creation and sustenance of a rigorous, dynamic and vibrant master's programme in biochemistry that imparts conventional and new knowledge in an innovative way, which ensures that fresh, young minds are trained and oriented to create newer knowledge in turn. The two-year full time programme is considered one of the best in the country as evidenced by the quality of students who complete this course and their achievements. They qualify national level examinations with ease and get absorbed into Ph.D. programmes in the best institutions worldwide.

The department has a rich tradition of an equally vibrant research programme in both basic and innovative applied research. While basic research has resulted in large number of publications in high impact journals, applied research has resulted in patents (both national and international) and also successful transfer of developed technologies to Indian industry, which converted the leads from the department into commercialized products. Notable examples of technologies transferred and commercialized are:

- (1) Liposomal Amphotericin B - commercialized by Life Care Innovations, Gurgaon.
- (2) Monoclonal antibodies to M13 phage protein - commercialized by M/s GE HealthCare (multinational).
- (3) Rapid test for HIV (AIDS) - commercialized by M/s Cadilla Pharmaceuticals Limited, Ahmedabad

- (4) Detection of *M. tuberculosis* in culture - transferred to M/s SPAN Diagnostics Limited, Surat and is likely to be available in the market shortly as the product has received approval from Drug Controller General of India.
- (5) Virosome Technology for targeted delivery – transferred to Pancea Biotech. India, New Delhi.

Additionally, there are many leads in the area of vaccine and drug development, gene and drug delivery and diagnostics especially in relation to diseases like tuberculosis, malaria and jaundice/hepatitis, some of which are in clinical trials as well. Many of the faculty members are working in close collaboration with industry or institutions, which are responsible for taking leads to the next level in the process of products development.

The department is equally at ease in basic research for newer knowledge creation with potential for translation. Several research initiatives in mechanistic understanding of pathogenesis, host virus membrane fusion, liposomal and nanomaterial formulation, oncogenesis, photosignalling, amyloidosis, stability and structure-function relationship of proteins and others are ongoing. The department has also taken lead in whole genome sequencing of indigenous pathogens like *Mycobacterium indicus pranii*, which has opened up new horizon in understanding the evolution of pathogenesis in mycobacterial species and leprosy. It represented the first completed genome of a new species of bacteria published from India.

51. Detail five major Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.

Strength:

- Highly active research in the areas of frontiers of modern biology with special emphasis on human diseases. The emphasis is also laid on the translational aspect of the research work through interaction and participation of industry.
- The M.Sc. programme in addition to theoretical knowledge provides considerable emphasis on the hand on experience in the fore-front areas of biochemistry through a dissertation based on research work and thesis writing.
- Special emphasis on critical review of literature and presentation by way of training in seminars.
- Very well equipped international standard laboratories
- Financial support from FIST and UGC-SAP programme. Also, high level funding for research from funding agencies such as DBT, DST, UGC, ICMR and CSIR.

Weaknesses:

- Space constraints to further expansion.
- Shortage of grant for post-graduate teaching and departmental infrastructures.

Opportunities:

- Emerging areas of translational biotechnology such as diagnostics strategies and development of kits for commercialization. Development of TB vaccines to channel into clinical trials, Gene delivery strategies for humans through virosomes and liposomes, development of new analogs of hemoglobins, novel anti-cancer and anti-malarial agents, Industrial interaction
- Attracting industry for R&D collaborations.

Challenges:

- Streamlining of commercialization of processes and products.

52. Future plans of the department.

- Future plans of the department include elevation of its teaching and research performance to an even higher stratum that suits the dynamics of the changing times and caters to the emerging needs of the country.
- The department envisions the need to convert the classical knowledge of biochemistry into more meaningful deliverables required to alleviate human suffering in general. With the tremendous progress both academically as well as technically, the need to translate conventional knowledge into innovations for management as well as amelioration of human diseases will be emphasized. Hence, the department will expand its ongoing programme in the areas of diagnostics, prophylactics and therapeutics for diverse human diseases.
- While the existing tuberculosis, malaria and hepatitis research will continue, the department will venture into several other areas like cardiovascular diseases, cervical and breast cancer, ciliopathies, channelopathies, optogenetics, hemoglobinopathies and neurodegenerative diseases with research programme on innovations in mechanistic understanding, target identification and validation, small molecule and peptide screening and newer tools for diagnostics and prophylactics.
- The department will be committed to creation of manpower for both basic mechanistic investigations as well as applied translational aspects of human diseases. It will expand its scope through initiation of research projects in relevant areas, like hard-core immunology and systems biology, via newly appointed faculties to complement the existing strengths.
- The teaching curriculum will witness constant innovations and further hands-on knowledge.

Declaration by the Head of the Institution

I certify that that the data included in this Self-Study Report (SSR) are true to the best of my knowledge.

This SSR is prepared by the institution after internal discussions, and no part thereof has been outsourced.

I am aware that the Peer team will validate the information provided in this SSR during the peer team visit.

Signature of the Head of the Department

Place: New Delhi

Date: