

### 3. Evaluative Report of the Department

1. Name of the Department : **Department of Microbial Biotechnology**
2. Year of establishment : **July, 2008**
3. Is the Department part of a School/Faculty of the university? : **Faculty of the University**
4. Names of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.) : **PG & Ph.D.**
5. Interdisciplinary programmes and departments involved : **University Innovation Cluster in Biotechnology.**
6. Courses in collaboration with other universities, industries, foreign institutions, etc.: **N.A.**
7. Details of programmes discontinued, if any, with reasons : **N.A.**
8. Examination System: Annual/Semester/Trimester/Choice Based Credit System : **Semester System**
9. Participation of the department in the courses offered by other departments : **Nil**
10. Number of teaching posts sanctioned, filled and actual (Professors/Associate Professors/Asst. Professors/others)

<b>Post</b>	<b>Professor</b>	<b>Associate Prof.</b>	<b>Assistant Prof.</b>
<b>Sanctioned</b>	1	--	3
<b>Filled</b>	1		3
<b>Actual</b>	1		3

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

<b>Name</b>	<b>Qualification</b>	<b>Designation</b>	<b>Specialization</b>	<b>No. of years of experience</b>	<b>No. of Ph.D. students guided for the last 4yrs</b>
<b>Prof. Rupinder Tewari</b>	Ph.D.& PDF	Professor	Microbial biotechnology	<b>31years</b>	<b>15</b>
<b>Dr.Rohit Sharma</b>	Ph.D.	Assistant Professor	Microbial Biotechnology	<b>13 years 9months</b>	<b>6</b>
<b>Dr.Rachna Singh</b>	Ph.D.	Assistant Professor	Microbial Biotechnology	<b>3.5 years</b>	<b>Nil</b>
<b>Dr.Samer Singh</b>	Ph.D.	Assistant Professor	Microbial Biotechnology	<b>10 years</b>	<b>Nil</b>

12. List of senior Visiting Fellows, adjunct faculty, emeritus professors : Nil
13. Percentage of classes taken by temporary faculty – programme-wise information  
**25%**
14. Programme-wise Student Teacher Ratio: **15:1**

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

Category	Number of Permanent Employees	Number of Vacant Positions	Number of permanent positions filled during the Year	Number of positions filled temporarily
Administrative Staff	1	Nil	Nil	5
Technical Staff	Nil	Nil	Nil	Nil

16. Research Thrust areas as recognized by major funding agencies

Identified since inception	Ongoing	Modified to, if any, and when UGC approval reference no. and date
		-

Faculty Member	Thrust Area	Future Thrust Area proposed
Prof. RupinderTewari	Microbiology and Microbial Biotechnology	Anti Microbial compounds, Industrial Enzymes, Biofertilizers, Probiotics, Anti microbial drug resistance
Dr.Rohit Sharma	Microbial Biotechnology with a focus on biocatalysis, fermentation technology and proteomics	Scale issues in Bioprocess/es and technology transfer to the industry
Dr. Rachna Singh	Microbial biofilms and their clinical implications	Bacterial-fungal interactions in human diseases
Dr.Samer Singh	Cancer, Vaccine development	Cancer, Vaccine development, Disease management, Biologicals

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 :

**a) national**

**Breaks-up of research projects is as follows:**

**Prof. RupinderTewari**

Agency	Title	Year	Amount
<b>DST</b>	Cloning, Purification and Crystallisation of Mur enzymes of Myco bacterium tuberculosis	2011-14	25 lakhs
<b>UGC</b>	Refolding of recombinant chitinase and chitobiase	2011-14	10 lakhs

**Dr.Rohit Sharma**

Agency	Title	Year	Amount
<b>BIRAC</b>	University Innovation Cluster in Biotechnology (Deputy Chief Coordinator)	2014-18	2.59 Crore
<b>BioBridge Healthcare Solutions Pvt. Ltd.</b>	Development of Expression Platform using yeast for human papilloma Virus (HPV) expression, fermentation, harvest, purification and process scale up.	2014	2.42lacs

**Dr.Rachna Singh**

Agency	Title	Year	Amount
<b>DST</b>	INSPIRE Faculty Scheme (research grant component) "Interspecies interactions between zygomycetes and bacteria: novel insights into microbial pathogenesis and therapeutic interventions"	2014	Rs. 35 lakhs

**Dr.Samer Singh**

Agency	Title	Year	Amount
<b>DBT, Govt. of India</b>	<i>A combination therapy for non-small cell lung carcinoma (NSCLC): targeting cancer stem cells and bulk tumor cell population together (Ramalingaswami Fellowship Project)</i>	2012-2017	82.0 lakh
<b>DBT, Govt. of India</b>	<i>Development of recombinant Omp25 based vaccine against brucellosis for humans (Co-Investigator)</i>	2012-2015	1.14 Crore

**(b) International : Nil**

National level organizations/ agencies		International level organizations / agencies	
No. of projects	Amount (Rs. in lac)	No. of projects	Amount (Rs. in lac)

18. Inter-institutional collaborative projects and associated grants received

- a) National collaboration                      b) International collaboration

**National Research Collaborations**

Faculty Member	Collaborator	Research Area
Prof. RupinderTewari	Dr. Vikas, Associate Professor, Department of Medical Microbiology, PGIMER, Chandigarh	Prevalence of drug resistance and mode of drug resistance in Acinetobacter sp.
Dr. Rohit Sharma	Dr. Ashish Ganguly, Scientist, Institute of Microbial Technology, Sector-39, Chandigarh	Exploring shape-function studies on how Swinholidase A disrupts the actin microfilament from muscle cells and other microbes.
Dr. Rachna Singh	Dr. Arunaloke Chakrabarti, Professor and Head, Department of Medical Microbiology, PGIMER, Chandigarh	Pathogenesis of allergic fungal rhinosinusitis

**International Collaborations: Nil**

<b>Faculty Member</b>	<b>Collaborator</b>
<i>International</i>	

19. Departmental projects funded by DST-FIST; UGC-SAP/CAS, DPE; DBT, ICSSR, AICTE, etc.; total grants received :

**Departmental Projects are funded by DST-FIST ; UGC-SAP ;**

20. Research facility / centre with

- state recognition : **Nil**
- national recognition : **Nil**
- international recognition  **Nil**

21. Special research laboratories sponsored by / created by industry or corporate bodies : **Nil**

22. Publications:

\* Number of papers published in peer reviewed journals (national / international):

**Prof. Rupinder Tewari: 65**

**Dr.Rohit Sharma: 23**

**Dr.Rachna Singh: 15**

**Dr.Samer Singh: 13**

\* Monographs

\* Chapters in Books

**Prof. Rupinder Tewari: 10**

**Dr.Rohit Sharma: 3**

**Dr.Rachna Singh: 2**

**Dr.Samer Singh: 5**

\* Edited Books

**Prof. Rupinder Tewari: 4**

\* Books with ISBN with details of publishers

**Prof. Rupinder Tewari:**

a) Invitation to Biotechnology, 81-309-0599-X, Viva Books Private Limited, 4737/23, Ansari Road, Daryaganj, New Delhi.

b) Role of Microbes in the Management of Environmental Pollution, 81-7648-223-4, APH Publishing Corporation,5, Ansari Road, Darya Ganj, New Delhi

\* Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.) :

**Dr. Rohit Sharma:** Citations **over 2300; Range 0-930** ; an **h-index** of 12 ; **i 10-index** of 12 – (as on 11<sup>th</sup> June, 2014 on Google Scholar citation database AND citations **over1540; Range 0-560**; in Scopus citation database as on 11<sup>th</sup> June, 2014).

**Dr. Rachna Singh: 15**

\* Citation Index – range / average

**Prof. Rupinder Tewari: Citation over 1100; Range 0-322**

**Dr. Rachna Singh:0-70**

**Dr. Samer Singh: 0-44s(0-67 as per scopus; 0-86 as per Google Scholar)**

\* SNIP

**Prof. Rupinder Tewari: 0-10.53** (as per data for year 2012)

**Dr.Samer Singh: 0-2.017**(as per data for year 2012)

\* SJR

**Prof. Rupinder Tewari: 0-12.003** (as per data for year 2012)

**Dr.Samer Singh: 0 - 4.152** (as per data for year 2012)

\* Impact Factor – range / average

**Prof. Rupinder Tewari: 0-14.1**

**Dr.Rohit Sharma: 0.5-9.6**

**Dr.Rachna Singh:1.3-5.34**

**Dr.Samer Singh: 0.74-8.65**

\* h-index :

**Prof. Rupinder Tewari: 14**

**Dr.Rohit Sharma:12**

**Dr.Rachna Singh:5**

**Dr.Samer Singh: 10**

23. Details of patents and income generated :

Prof. Rupinder Tewari: NIL

Dr. Rohit Sharma:

S No	Inventors	Title	Filed/Granted	Year	Application No.	Indian / International
1.	A. Banerjee, P. Kaul, Rohit Sharma, HPS Chawla, C.L. Kaul, U.C.	A process for preparing R- $\alpha$ -hydroxyarene acetic acid using a nitrilase from a bacterial	Granted	2007	Granted vide no. 197592	Indian

	Banerjee.	source.				
2.	<b>Rohit Sharma</b> , J. Kaur, V. Thakur, S.K. Rana and Nils- Kåre Birkeland	Lipase/esterase- catalyzed synthesis of alkyl esters by transesterification.	<b>Filed</b> (RFE filed, 2014)	2009	2562/DEL/2009 (RFE filed, 2014)	<b>Indian</b>
3.	<b>Rohit Sharma</b> , S. Sharma, M. Sharma, E. Khullar, K. Bansal, A. Sharma	Nitrile hydrolyzing microbes for industrial use.	<b>Filed</b>	2011	2883/DEL/2011	<b>Indian</b>
4.	<b>Rohit Sharma</b> , S. Sharma, M. Sharma, E. Khullar, K. Bansal, A. Sharma.	Low cost culture medium for nitrile hydrolyzing microbes.	<b>Filed</b>	2011	2882/DEL/2011	<b>Indian</b>
5.	M Sharma, S. Khanna, S. Sharma, J. Kaur, <b>Rohit Sharma.</b>	Anti-carcinogenic extract from <i>Pithecellobium dulce</i> .	<b>Filed</b>	2011	2972/DEL/2011	<b>Indian</b>

24. Areas of consultancy and income generated : **Nil**

25. Faculty selected nationally / internationally to visit other laboratories / institutions industries in India and abroad:

1. Prof. Rupinder Tewari:

a) University of Cambridge, Cambridge, U.K.

b) University of Nottingham, Nottingham, U.K.

c) University of Birmingham, Birmingham, U.K.

d) University of London, London, U.K.

2. Dr. Rachna Singh: Visiting Scholar (Fulbright-Nehru Postdoctoral Research Fellow), 2012-13 at Dept of Microbiology and Immunology, Stanford University School of Medicine, Stanford, California, U.S.A. As a part of her academic assignment, she also visited Ames Research Centre, The National Aeronautics and Space Administration (NASA), Mofett Field, California, U.S.A.

26. Faculty serving in

a) National committees b) International committees c) Editorial Boards d) any other (please specify)

a) **National Committee**

b) **International Committee**



**c) Editorial Boards**

**Prof. Rupinder Tewari: Member, Editorial Board, Indian Journal of Microbiology (2010-12).**

**d) Reviewer**

Dr. Rupinder Tewari: Many National and International journals.

Dr. Rohit Sharma: Reviewer for Tetrahedron (Impact factor 2.8), an International peer reviewed journal; Reviewer for Indian Journal of Microbiology.

Dr. Rachna Singh: Invited reviewer for peer reviewed, indexed, international journals – Journal of Medical Microbiology, Mycoses

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

S.N.	Nature of the Course/Summer School	Place	Duration	Sponsoring Agency
1	Prof. R. Tewari: Organizing Secretary of 79 <sup>th</sup> Annual Meeting of Indian Academy of Sciences (Bangalore)	Panjab University	3 days (Nov, 8-10, 2013)	Indian Academy of Sciences, Bangalore

28. Student projects

- percentage of students who have done in-house projects including inter-departmental projects : **All M.Sc. Final Year students do the in-house Research Project in the department.**
- percentage of students doing projects in collaboration with other universities industry / institute : **25% of Ph.D. scholars do research in other national laboratories**

29. Awards / recognitions received at the national and international level by

Faculty :

**Prof. R. Tewari:**

1. Commonwealth Academic Staff Scholarship (1984-86), Sponsored by The British Council, U.K.

2. Rockefeller Biotechnology Fellowship sponsored by The Rockefeller Foundation, U.S.A.

**Dr. Rachna Singh:**

1. Awarded DST-INSPIRE Faculty Scheme, 2014

2. Awarded Fulbright-Nehru Postdoctoral Research Fellowship, 2012

3. Manuscript photograph published on cover page (J Med Microbiol. 2010;59(5):521-7.

4. Manuscript (J Antimicrob Chemother.2010;65(9):1955-8) acknowledged by the Editor-in-Chief for contributing to the journal's increased impact factor in 2011 and 2012, and excellent quality.

## STUDENT ACHIEVEMENTS: -

### Awards

1. Award to Ms. Bharti Garg & Poonam Sharma M.Sc 2<sup>nd</sup> Year Students got 1st Prize in Sangharsh Fest by D.C.S.A.in Rangoli Making held in Panjab University.
2. Award to Ms. Bharti Garg & Poonam Sharma M.Sc 2<sup>nd</sup> Year Students got 2nd Prize by Chemical Engineering in Rangoli Making held in Panjab University.

### Awards in Poster Presentation: -

1. Award to Ms. Radhika Trikha Ph.D student got 1<sup>st</sup> Prize in Chandigarh Science Congress in Poster Presentation held in Panjab University.

### Award in Oral Presentation: -

N.A.

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

#### **Workshops / Conference / Symposium organized by the Department (2009-2013)**

S.No.	Title of the Seminar/Conference / Symposia	Date
1.	79 <sup>th</sup> Annual Meeting of Indian Academy of Sciences (Bangalore)	8 <sup>th</sup> – 10 <sup>th</sup> Nov, 2013

31. Code of ethics for research followed by the departments : **Projects involving animal / human samples have to take clearance from the Animal Ethical Committee, P.U. and Institutional Ethics Committee, P.U.**

32. Student profile programme-wise:

Name of the Programme (refer to question no. 4)	Applications received	Selected		Pass percentage	
		Male	Female	M	F
<b>M.Sc. 1<sup>st</sup> Year Microbial Biotechnology</b>	<b>98 through CET (PG)-P.U.</b>	<b>4</b>	<b>15</b>	<b>90%</b>	<b>90%</b>

<b>Ph.D.</b>	Admissions are done on the basis of merit and availability of seats	2	15	N.A.	N.A.
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### 33. Diversity of Students

Name of the Programme (refer to question no. 4)	% 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. Microbial Biotechnology	75%	Nil	25%	Nil
Ph.D.	44.5%		55.5%	

34. How many students have cleared Civil Services and Defence Services examinations, NET, SET, GATE and other competitive examinations? Nil

### 35. Student progression

Student progression	Percentage against enrolled
UG to PG	Only PG course available
PG to M.Phil.	N.A.
PG to Ph.D.	Depends on the availability of the Ph.D. seats with the faculty of the department
Employed	No Campus selection done by the department
<input type="checkbox"/> Campus selection	
<input type="checkbox"/> Other than campus recruitment	--
Entrepreneurs	Data not available

### 36. Diversity of staff

<b>Percentage of faculty who are graduates</b>	
of the same universities	<b>75%</b>
from other universities within the State	---
from universities of other states	<b>25%</b>
from universities outside the country	---

37. Number of faculty who were awarded M.Phil., Ph.D., D.Sc. and D.Litt. during the assessment period : **Nil**

38. Present details of departmental infrastructural facilities with regard to

- a) Library : **Small library of the department**
- b) Internet facilities for staff and students : **Available**
- c) Total number of class rooms: **1**
- d) Class rooms with ICT facility : **Nil**
- e) Students' laboratories : **1**
- f) Research laboratories: **2**

39. List of doctoral, post-doctoral students and Research Associates

- a) from the host institution/university :

➤ **List of Doctoral Students**

<b>S.No.</b>	<b>Name of the Doctoral Student</b>	<b>Institute</b>
1	Amita	Panjab University
2	Avantika Sharma	Panjab University
3	Gaurvee Sharma	Panjab university
4	NavkiranKaur	Panjab University
5	Meenu	Panjab University

6	ParvinderKaur	Panjab University
7	RadhikaTarikha	Panjab University
8	Om Parkash	Panjab University

b) from other institutions/universities:

➤ **List of Doctoral Students:**

S.No.	Name of the scholar	Institute
1	AnuJalpot	Chandigarh Group of College, Landran
2	Arun Kumar Dangi	Kurukshetra University, kurukshetra
3	MadhuSmita	Thapar University, Patiala
4	GurdeepKaur	University of Allahabad, Allahabad
5	MansimranKhokhar	Goswami Ganesh DuttaSanatan Dharma Colleg, Sector 32, Chandigarh
6	Vishal Thakur	Uttaranchal College of Science and Technology, Dehradun
7	Jyoti	Chandigarh Group of College, Landran
8	IswinderKaur	Thapar University, Patiala
9	KashikaArora	Banasthali University, Rajasthan
10	GaganpreetKaur	Sri Guru Gobind Singh College, Chandigarh
11.	VikasChoudhary	Mohan LalSukhadiaUniversity, Udaipur

40. Number of post graduate students getting financial assistance from the university : **8**

41. Was any need assessment exercise undertaken before the development of new programme(s)?  
If so, highlight the methodology : **No new programme started in the department.**

42. Does the department obtain feedback from

1. faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?
2. **Yes, feedback is taken and changes are made in the curriculum accordingly**
3. students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?

**Yes, students' suggestions are given weightage while modifying the curriculum**

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

**No data available**

43. List the distinguished alumni of the department (maximum 10): Nil
44. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts :

S.No.	Title of the Seminar/Conference / Symposia	Date
1	79 <sup>th</sup> Annual Meeting of Indian Academy of Sciences (Bangalore)	8 <sup>th</sup> Nov – 10 <sup>th</sup> Nov, 2013

45. List the teaching methods adopted by the faculty for different programmes:
  - **Using Audio Visual Aids**
  - **Over Head Projection**
  - **Chalk and Black Board**
46. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?  
**Syllabus is regularly updated as per the need of the course which is reflected by the number of students clearing UGC-NET/ICMR/DBT exam**
47. Highlight the participation of students and faculty in extension activities.

**Faculty delivers extension lectures in different Departments pursuing Microbial Biotechnology Course.**

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

S.No.	Title of the Seminar/Conference / Symposia	Date
1	79 <sup>th</sup> Annual Meeting of Indian Academy of Sciences (Bangalore)	8 <sup>th</sup> Nov – 10 <sup>th</sup> Nov, 2014

- **Educational visits to National Research Laboratories**
- **Student Activities including collage making, poster making, debate, quiz and oral presentations**
  - State whether the programme/ department is accredited/ graded by other agencies? If yes, give details : **Not at the departmental level**
  - Briefly highlight the contributions of the department in generating new knowledge, basic or applied :
  - **Department is actively involved in Industry-Institute interaction which is so very important in today's global scenario not only in biotechnology but all branches of Science. This interaction has resulted in generating funds in the form of research project from the corporate.**
  - **These efforts of involving the Corporate participation in the University have resulted in BIRAC in collaboration with National Innovation Council granting the first "University Innovation Cluster in Biotechnology (UIC-B)" to Panjab University, Chandigarh and I am the Deputy Chief Mentor of the same. Under this a total grant of Rs. 2.59 Cr for four years starting in April, 2014, has been sanctioned in order to assist and promote creation of Cluster Innovation Center in Biotechnology (CIC-B)**
  - **Department updates the course curriculum periodically to include the latest in the field for the benefit of the students.**
  - Detail five major Strengths, Weaknesses, Opportunities and Challenges (SWOC) of the department.
    - **Strengths :**
      - b) All the faculty members are having independent research grants form national funding agencies (UGC/DBT/ICMR/DST)
      - c) 50% of the students of the department clear ICMR/DBT/UGC/CSIR/NET Exams
      - d) Faculty of the department have collaborative projects with national laboratories of the country
      - e) Majority of the Research Scholars have open fellowships
      - f) Faculty have availed International Visits / Fellowships
    - **Weaknesses**
      - a) The department needs upgradation in facilities for genomics and proteomics research
      - b) Permanent faculty strength is low
    - **Opportunities**
      - a) Microbial Biotechnology base in the country and abroad is expanding,. So the scope for the students of Microbial Biotechnology is high.
      - b) There is a large scope for enterpreneural endeavours

➤ **Challenges**

- a) Gap in the requisite skills in the students for industrial employment
- b) Application based research has to be encouraged

**52. Future plans of the department :**

- a) Research facilities in the department will be upgraded
- b) Individual faculty members will be encouraged to initiate research in new directions and the existing research programs will be strengthened
- c) Long term research emphasis will be on the development of cost-effective technologies and products