

### 3. Evaluative Report of the Department

1. Name of the Department : **Department of Biotechnology, Panjab University, Chandigarh**
2. Year of establishment : **1989**
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.) : **UG ; PG & Ph.D.**
5. Interdisciplinary programmes and departments involved : **No**
6. Courses in collaboration with other universities, industries, foreign institutions, etc.:  
**National Agri-Food Biotechnology Institute, Mohali, Panjab**
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	1	6
<b>Filled</b>	--	3	3
<b>Actual</b>	1 (acting under CAS)	2 (acting under CAS)	1 (permanent-filled) 3 (temporary-filled)

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

<b>Name</b>	<b>Qualifications</b>	<b>Designation</b>	<b>Specialization</b>	<b>No. of years of experience</b>	<b>No. of Ph.D/M.Phil students guided for the last four years.</b>
<b>Prof. Jagdeep Kaur</b>	Ph.D.	Professor	Microbial biotechnology, Management of Diseases cancer epigenetics	<b>21years</b>	<b>15</b>
<b>Dr. Neena Capalash</b>	Ph.D.	Associate Professor & Chairperson	Microbial biotechnology, cancer epigenetics	<b>14years</b>	<b>6</b>
<b>Dr. Jagtar Singh</b>	Ph.D.	Associate Professor	Molecular Human Genetics, Immunology & Enzyme Technology	<b>13years</b>	<b>9</b>
<b>Dr. Kashmir Singh</b>	Ph.D.	Assistant Professor	Plant biotechnology	<b>8years</b>	<b>6</b>

12. List of senior Visiting Fellows, adjunct faculty, emeritus professors :  
**Prof. R.C. Sobti, Emeritus Professor, Deptt. of Biotechnology, Panjab University.**
13. Percentage of classes taken by temporary faculty – programme-wise information  
**41%**
14. Programme-wise Student Teacher Ratio: 20:1

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	6	Nil	Nil	Nil
Technical Staff	5	2 vacant (1 Gr. I & 1Gr. III)	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
Cancer Biology	Molecular Epidemiology of Cancer / Asthma / Tuberculosis	-
Industrial Enzymes	Plant Biotechnology	-
	Microbial biotechnology	-
	Management of Diseases	-

Faculty Member	Thrust Area	Future Thrust Area proposed
Dr. Jagdeep Kaur	Microbial biotechnology, Management of Diseases cancer epigenetics	Lipases as a drug target in mycobacterium
Dr. Neena Capalash	Microbial biotechnology, cancer epigenetics	Control of multiple drug tolerance in <i>Acenitobacter baumannii</i>
Dr. Jagtar Singh	Molecular Human Genetics, Immunology & Enzyme Technology	Study the anti-cancer activities of parthenin analog P16
Dr. Kashmir Singh	Plant biotechnology	Regulation of secondary metabolism by sRNAs,

		Mechanism of pathogen resistance in plants
Dr. Ravindresh K. Chhabra	Cancer biology/ Management of Diseases	Role of miRNAs in the biology of cancer stem cells
Dr. Monika Sharma	Microbial biotechnology, Management of Diseases/cancer	RNomics studies in pathogenesis of breast cancer
Dr. Baljinder Singh	Microbial/environment biotechnology	Environmental conservation and protection
Dr. Pooja Makkar	Management of diseases/ Bioinformatics	Insilico drug designing and molecular modeling

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:**

**Emeritus Prof. R.C. Sobti**

Agency	Title	Year	Amount
UGC	To investigate the Role of Stat Genes in HPV-Mediated cervical carcinogenesis in North Indian Population	2009-2011	15 lac

**Prof. Jagdeep Kaur**

Agency	Title	Year	Amount
ICMR	Cloning Expression and Characterization of the selected lipase genes (Lip J, Lip K and Lip S) of Mycobacterium tuberculosis H37Rv’.	2011-2014	24 lac
DBT	‘Cloning , Expression and characterization of the selected Lipase genes (LipD & LipQ) of Mycobacterium tuberculosis H37Rv and its possible role in virulence’	2009-2012	23 lac
CSIR	‘Cloning , Expression and characterization of three putative Lipase genes (Lip L, N and V) of Mycobacterium tuberculosis H37Rv	2009-2012	25 lac
DST	Improving thermal tolerance of a Bacillus lipase by	2009-	26 lac

	Random Mutagenesis	2012	
<b>CSIR</b>	Use of random mutagenesis for the improvement of thermal tolerance of a <i>Bacillus</i> lipase	2008-2011	24 lac
<b>UGC</b>	Cold Adaptation of a Mesophilic enzyme by Laboratory Evolution: Lipase as a model enzyme	2007-2010	9.6 lac
<b>UGC</b>	Cloning of a gene encoding pectinase from metagenomic DNA: biochemical and biophysical characterization of the gene product.	2013-16	9.37 lac
<b>CSIR</b>	Study on differential expression of Hormone Sensitive Lipase genes of <i>Mycobacterium tuberculosis</i> during different growth periods and stress conditions	2013-16	23.00 lac
<b>DBT</b>	A study on expression and characterization of lipolytic enzymes in dormant stage of <i>Mycobacterium tuberculosis</i> by transcriptome analysis.	2012-15	28.00 lac

**Dr. (Mrs.) Neena Capalash**

<b>Agency</b>	<b>Title</b>	<b>Year</b>	<b>Amount</b>
<b>ICMR</b>	Potential of <i>L.plantarum</i> by cloning lactonase gene for quenching quorum sensing in virulent strains of <i>P.aeruginosa</i>	2010-2013	14 lac
<b>CSIR</b>	Screening of natural compounds for the reversal of epigenetic changes in cervical cancer cell lines	2009-2012	22.5 lac
<b>UGC</b>	Evaluation of lactonase mediated quorum quenching to control virulence and antibiotic resistance in <i>P.aeruginosa</i>	2009-2012	9.89 lac

**Dr. Jagtar Singh**

<b>Agency</b>	<b>Title</b>	<b>Year</b>	<b>Amount</b>
<b>UGC</b>	A study of single nucleotide polymorphisms in candidate's genes associated with asthma in North Indian population	2011-14	9.14 lac
<b>CSIR</b>	A case control study for evaluation of gene		20.00 lac

	polymorphism as a possible risk factor of tuberculosis.	2012-15	
<b>DST</b>	Association of sequence variations in DNA repair and cell cycle genes with head and neck cancer in the North Indian population.	2013-16	23.70 lac

### Dr. Kashmir Singh

Agency	Title	Year	Amount
<b>UT-DST</b>	Standardization of enzyme aided juice extraction technology protocol from amla ( <i>Phyllanthus emblica</i> ) fruit.	2012-2013	0.5 lac
<b>CSIR</b>	Functional Genomics of Saponins biosynthesis in <i>Chlorophytum borivilianum</i>	2008-2012	20 lac
<b>DST</b>	Flavonoid biosynthesis in <i>Phyllanthus emblica</i> : Gene cloning, functional characterization and regulation of selected genes of pathway	2008-2011	24 lac
<b>CSIR</b>	<i>De novo</i> transcriptome sequencing of <i>Chlorophytum borivilianum</i> using RNA-Seq Technology	2013-16	29.00 lac
<b>UGC</b>	Silencing of <i>Cap Binding Proteins (cbp20 and cbp80)</i> to study their role in abiotic stress tolerance in plants	2013-16	9.7 lac
<b>DBT</b>	A study on expression and characterization of lipolytic enzymes in dormant stage of <i>Mycobacterium tuberculosis</i> by transcriptome analysis.	2012-15	10.00 lac

### Dr. Monika Sharma

Agency	Title	Year	Amount
<b>DST-SERC Fast Track Young Scientist</b>	“RNomics of AATF gene in pathogenesis of breast cancer”	2009-12	23.57 lac
<b>DST-WOS-A</b>	“Evaluation of cytotoxic potential of <i>Pithecellobium dulce</i> extracts and modulation of apoptotic signature of breast cancer cells”	2013-2016	25.10 lac

### Dr. Ravindresh Chhabra

Agency	Title	Year	Amount
<b>DST-Inspire</b>	Identification of miRNA(s) that potentiate the inter-conversion of cancer stem cells and tumour cells	2013-18	35.00 lac

**(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)
<b>25</b>	<b>4.83 crore</b>	Nil	Nil

**(c) Total Grants Received :**

Year	Name of the Funding agency (Indian/ International)	Building	Equipment/ Infrastructure	Staff Contingency /Consumable	Total
2009	UGC-SAP(2007-12)	-	23.00 lac	16.00 lac	39.00 lac
2010	DST-PURSE (2009-10)	-	12.75 lac	3.00 lac	15.75 lac
	DST-PURSE (2010-11)	-	5.00 lac		5.00 lac
	DST-PURSE (2011-12)	-	-	26.00 lac	26.00 lac
2011	DST-FIST-II	-	104.50 lac	-	104.50 lac
2012	XII-Plan		3.50 lac		3.50 lac
2013	UGC-SAP (2013-18)	-	36.0lac	10.0 lac	46.0 lac
<b>TOTAL:</b>					<b>2.39 Cr</b>

18. Inter-institutional collaborative projects and associated grants received

a) National collaboration

b) International collaboration

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### National Research Collaborations

<b>Faculty Member</b>	<b>Collaborator</b>	<b>Research Area</b>
Dr. Jagdeep Kaur	Dr R. Kaur, GNDU, Amritsar, Dr R K Sharma, IHBT Palampur, Dr U.D. Gupta, JALMA, Agra Dr S. Dogra, PGIMER, Chandigarh Dr Ajay Kumar, NABI, Mohali	Management of diseases
Dr. Neena Capalash	Dr Abid Ahmed Dhar, IIM Jammu Dr S P Singh, NABI, Mohali	HDAC inhibitors for cancer therapeutics Natural quorum quenchers
Dr. Jagtar Singh	Dr. S.K. Jindal and Dr. Dheeraj Gupta Department of Pulmonary Medicine, PGIMER, Chandigarh	Epidemiology of asthma and tuberculosis
	Dr. Anoop Raj, Maulana Azad Medical College, New Delhi	Epidemiology of Head & Neck Cancer
	Dr. Lalit M. Bharadwaj & Dr. Inderpreet Kaur, CSIO, Chandigarh	Nanoscience & Nanotechnology
Dr. Kashmir Singh	Dr S Ramachandaran, IGIB, New Delhi	Bioinformatics
	Dr Sanjay Kumar, IHBT Palampur	Plant Molecular Biology
	Dr I Sawant, NRC Grapes, Pune	Disease resistance in grapes

### International Collaborations :

<b>Faculty Member</b>	<b>Collaborator</b>
<i>International</i>	
Prof. R.C. Sobti Vice-Chancellor	Univ. of Miami Medical School, Miami, FL, USA.
Dr. Kashmir Singh	Missouri State University, USA



	McGill University, Canada
	Adam Mickiewicz University , Poland

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 ;  
2.39 Crore**

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) : **138**
- Monographs
- Chapters in Books
  - **5 chapters**
- Edited Books
- Books with ISBN with details of publishers
- Number listed in International Database (For e.g. Web of Science, Scopus,
  - Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.) : **123**
- Citation Index – range / average
  - **0-44**
- SNIP
- SJR
- Impact Factor – range / average
  - **0.74-6.00**
- h-index : **10**

23. Details of patents and income generated :

S N o	Applicant	Title	Filed/ Grante d	Year	Applicatio n No.	Indian / Internationa l
1.	<b>Jagdeep Kaur</b> , Pushpender Kumar Sharma, Ranvir Singh	Engineering of the metagenome derived lipase	Filed	2010	Patent 1279DEL2 010	Indian
2.	Pardeep Kumar Bhardwaj, Arun Kumar, Amit Kishore, Sanjay Ghawana, Arti Rani , <b>Kashmir Singh</b> , Harsharan Singh, Ravi Shankar Singh, Hitesh Kumar, Payal Sood, Som Dutt, Sanjay Kumar, Paramvir Singh Ahuja	A method for cloning functional gene of copper/zinc superoxide dismutases using oligonucleotide primers	Filed	2009	PCT/IN200 9/000211	International
3.	<b>Monika Sharma</b> , S. Khanna, S. Sharma, <b>J. Kaur</b> , R. Sharma.	Anti- carcinogenic potential of leaf extracts of the medicinal plant <i>Pithecellobium dulce</i> .	Filed	2011	2972/DEL/ 2011	Indian
4.	R. Sharma, S. Sharma, <b>Monika Sharma</b> , E. Khullar, K. Bansal, A. Sharma	Nitrile hydrolyzing microbes for industrial use.	Filed	2011	2883/DEL/ 2011	Indian.
5.	R. Sharma, S. Sharma, <b>Monika Sharma</b> , E. Khullar, K. Bansal, A. Sharma	Low cost culture medium for nitrile hydrolyzing microbes.	Filed	2011	2882/DEL/ 2011	Indian

24. Areas of consultancy and income generated : **Nil**
25. Faculty selected nationally / internationally to visit other laboratories / institutions industries in India and abroad:
- **Prof. Jagdeep Kaur** awarded **ICMR international fellowship to visit**
    - Dr. Sharon Kendall's lab , The Royal Veterinary College, Department of Pathology and Pathogen Biology, London
  - **Dr. Kashmir Singh**
    - Research Associate at Grapevine Biotechnology Centre, at Missouri State University, M.O. U.S.A.
    - Visiting Scientist at Plant Science Department, McGill University, Camden, Canada
26. Faculty serving in
- a) National committees b) International committees c) Editorial Boards d) any other (please specify)
- a) National Committee**
- Prof. Jagdeep Kaur**
- Member Expert in the subject field of Bio-Technology, for interviewing the candidates for the Israel Government Scholarship 2013.
  - Member Expert in the subject field of Bio-Technology, for interviewing the woman candidates for the post doctoral position 2013 at UGC New Delhi.
  - Reviewer of projects in DST, New Delhi and DBT, Govt of India, New Delhi
- b) International Committee**
- Dr. Kashmir Singh**
- Reviewer of U.S., Israel Binational Agriculture Research & Development, (B.A.R.D) grants, U.S.A.
- c) Editorial Boards**
- Prof. Jagdeep Kaur**
- Member editorial board of Panjab University research journal (Science).
  - Member editorial board of SAJOSPS

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	Organized a National Symposium on “Frontiers in Biotechnology”	February 17 <sup>th</sup> , 2011.	PU, Chandigarh	UGC-SAP
2	Refresher Course in “ <b>Biotechnology</b> ”.	Jawaharlal Nehru University, New Delhi	July 26 <sup>th</sup> - August 20 <sup>th</sup> , 2010.	UGC, New Delhi
3	Workshop on “Bioinformatics and molecular modeling in drug design”	Biotech Park, Lucknow	June 23 <sup>rd</sup> -25 <sup>th</sup> , 2010.	Department of Biotechnology, Govt. of India
4	Short Term Training on “Infectious and intoxications transmissible from animals to man”	Institute of Biotechnology (G.B. Pant Univ. of Agri. & Tech.) Patwadanger (Nanital), Uttarkhand	April 19 <sup>th</sup> -24 <sup>th</sup> , 2010.	--
5	Summer School on “Recent advances in analytical techniques and innovative approaches for quality assurance and safety of dairy foods.”	NDRI, Karnal	7 <sup>th</sup> -27 <sup>th</sup> July, 2009	ICAR, New Delhi
6	AMI-ASM Workshop on “Scientific writing and publication”	Panjab University, Chandigarh	November 3, 2011	--
7	UGC sponsored workshop on “Capacity building of women managers in higher education”	DAV College, Chandigarh	25 -29 November, 2009.	--

## 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. Jagdeep Kaur**
  - o Member of the National Academy of Sciences, India (2013)
  - o ICMR international fellowship for senior biomedical scientists 2013-14 (availed from Jan 13-27, 2014)
- Doctoral / post doctoral fellows
- **Students**

### **STUDENT ACHIEVEMENTS: -**

#### **Awards**

1. Awarded 1<sup>st</sup> Prize in 'Collage Making Competition' in 'National Science Day Celebration', 28<sup>th</sup> February (2010), Department of Biotechnology, Panjab University, Chandigarh : Jaspreet & Kunzes
2. Awarded 1<sup>st</sup> Prize in 'Model Exhibition' in 'National Science Day Celebration', 28<sup>th</sup> February (2010), Department of Biotechnology, Panjab University, Chandigarh : Aman Mahajan & Shefali Chadha
3. Awarded 1<sup>st</sup> Prize in 'Debate' in 'National Science Day Celebration', 28<sup>th</sup> February (2010), Department of biotechnology, Panjab University, Chandigarh : Shatakshee Chatterjee
4. Awarded 3<sup>rd</sup> Prize in 'Caption Contest' in 'National Science Day Celebration', 28<sup>th</sup> February (2010), Department of Biotechnology, Panjab University, Chandigarh : Aman Mahajan
5. Awarded 2<sup>nd</sup> Prize in 'Ad-Making' in 'National Science Day Celebration', 28<sup>th</sup> February (2010), Department of biotechnology, Panjab University, Chandigarh: Jaspreet, Shreya, Amanpreet, Shabda
6. Awarded 1<sup>st</sup> Prize in 'Senior Level Quiz Contest' in Biotechnica Chandigarh-2010 (November 16-18, 2010) held at Panjab University , Chandigarh , India . : Aman Mahajan & Shefali Chadha

#### **Awards in Poster Presentation: -**

1. Young scientist award to Mr. Avneesh Kumar for best poster entitled " Isolation of high quality RNA from Phyllanthus emblica and its analysis by downstream applications" in

- International conference in Microbial, Plant and Animal Research (ICMPAR-2012; March 29-31 2012) held at Modi Institute of Technology and science, Lakshmanagarh, Rajasthan
- Award to Mr. Ankur Gautam Best poster prize entitled “Structural and Functional features of UDP-*N*-acetylenolpyruvoyl glucosamine reductase of *Mycobacterium tuberculosis* H37Rv” in International Conference on Understanding and Managing Pathogenic Microbes UMPM 2010 (22-24 January, 2010) held at Institute of Microbial Technology, Chandigarh, India.
  - Award to Phulan Rani: 2<sup>nd</sup> Prize for Oral Presentation entitled ‘Identification of Antimicrobial compounds from *Aegle marmelos* using chromatographic fingerprinting’ Symposium on Natural Products in Health & Disease: Biochemical & Molecular mechanisms”, 5<sup>th</sup> -6<sup>th</sup> March, 2010, Department of Biochemistry, Panjab University, Chandigarh.
  - Award to Ms. Mamta: Best Poster Prize “Stimulatory effect of P-solubilizing bacteria on the growth and medicinal contents of Aloe vera” in CHASCON-2010, at Panjab University, Chandigarh from March 19-20, 2010.
  - Award to Mr. Ankur Gautam: Best Poster Prize “Bacterial cell wall as a source of potential drug targets for antibacterial chemotherapy” in Biotechnica Chandigarh-2010 (November 16-18, 2010) held at Panjab University, Chandigarh, India.
  - Award to Antar Puneet Virk: 1<sup>st</sup> Prize for Oral Presentation entitled “Cloning, purification and characterization of a new esterase from *Rheinheimera* sp. isolated from industrial effluent” at Chascon 2010, Panjab University, Chandigarh 160014, India.
  - Award to Abhimanyu Kumar Jha: 2<sup>nd</sup> Best Poster Prize entitled “Effect of plant extracts and EGCG on promoter hypermethylation of RAR $\beta$ 2 in HeLa celline”. Published in Biotechnica Chandigarh-2010 (November 16-18, 2010) held at Panjab University, Chandigarh, India.
  - Award to Mr. Ankur Gautam I<sup>st</sup> Prize both at University and north zone level. II<sup>nd</sup> prize for best proposal at national Level in Student Research Convention (SRC-2010) conducted by Association of Indian Universities, New Delhi.

**Award in Oral Presentation: -**

- Best paper award to Ms Shikha Kalra for her paper entitled “Understanding molecular aspects for saponins biosynthesis in *C. borivilianum*” in Medicinal Plant Genomics area during International symposium on Genomics of crops, Medicinal plants and Microbes” held at Deptt of Botany, university of Kerala, May 29-31, 2011.

**M.Sc. II<sup>nd</sup> Year**

Neha Saini: - Bronze Medal – Zoom Individual Medley, Swimming Inter College Games, PU, Chd.

**M.Sc. 1<sup>st</sup> Year:-**

Inter college-Tackwondo (Gymnasium hall, PU Campus, Chd.)  
Bronze medal - Sakshi Mittal  
Bronze medal - Poonam

**B.Sc. III<sup>rd</sup> year**

Justin Jacob - Gold Medal in Painting Scitron 2013

Vinny Verma- Gold Medal in Scitron debate  
 2<sup>nd</sup> Prize in Elocution held by Chandigarh Saahitya Academy  
 Raghav Sood- Silver Medal in Korfball, Intercollege Games – 2013  
 Bronze Medal in Netball, Intercollege Games – 2013  
 Gold Medal in Korfball, Intercollege, 2014  
 Bronze Medal in Korfball, All India Interuniversity

### **B.Sc. IInd year**

Tanya Sharma:-

Earned merit certificate in quantitative health research from Harvard University.  
 Served as college Head for Rotaract club Chandigarh Himalayan conducting social wants for charity and Chandigarh administration.

Top 15 finalists in “I India Lead” an initiative by times of India.

Ist Prize solo signing at PEC FEST, 2013

Ist Prize solo signing at Rose Fest, PU

2<sup>nd</sup> Prize solo signing at Jhankar, Annual Fest, PU

2<sup>nd</sup> Prize solo signing at Rasayan, Deptt. of Chemistry, PU

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)**

<b>S.No.</b>	<b>Title of the Seminar/Conference / Symposia</b>	<b>Date</b>
1.	Chascon – 2009	26 <sup>th</sup> -27 <sup>th</sup> Feb 2009
2.	Recent Advances in Plant Biotechnology	12th March 2010
3.	One day seminar in “Recent Techniques in Biotechnology – 2010”	26th Nov 2010
4.	National Symposium on ‘Frontier in Biotechnology’ at Department of Biotechnology, PU	17 <sup>th</sup> Feb 2011
5.	Chascon – 2011	26 <sup>th</sup> – 28 <sup>th</sup> Feb 2011
6.	Biotechnika 2011	13 <sup>th</sup> – 14 <sup>th</sup> Oct 2011
7.	One day seminar in “Recent Techniques in Biotechnology – 2011”	16 <sup>th</sup> Nov 2011
8.	One day Seminar on Recent Techniques in Biotechnology, 2012 on 15 September 2012 at Department of Biotechnology, PU	15 <sup>th</sup> Sep 2012
9.	Chascon – 2013	1 <sup>st</sup> – 3 <sup>rd</sup> March 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	Applications received	Selected		Pass percentage	
		Male	Female	M	F
(refer to question no. 4)					
<b>B.Sc. 1<sup>st</sup> year (H.S.) Biotechnology</b>	Applications received through <b>CET- P.U.</b>	<b>4(2009-10) 3(2010-11) 8(2011-12) 5(2012-13) 5(2013-14)</b>	<b>11(2009-10) 11(2010-11) 8(2011-12) 9(2012-13) 10(2013-14)</b>	<b>100%</b>	<b>100%</b>
<b>M.Sc. 1<sup>st</sup> Year (H.S.) Biotechnology</b>	<b>132</b> through OCET-P.U. (for 7 seats 2009-10) <b>142</b> through OCET-P.U. (for 7 seats 2010-11) <b>171</b> through OCET-P.U. (for 7 seats 2011-12) <b>112</b> through OCET-P.U. (for 7 seats 2012-13) <b>106</b> through OCET-P.U. (for 7 seats 2013-14)	<b>4(2009-10) 6(2010-11) 4(2011-12) 2(2012-13) 5(2013-14)</b>	<b>16(2009-10) 17(2010-11) 16(2011-12) 16(2012-13) 18(2013-14)</b>	<b>100%</b>	<b>100%</b>
<b>Ph.D.</b>	Admissions are done on the basis of merit and availability of seats	1(2009) 2(2010) 4(2011) 2(2012) 7(2013)	3(2009) 6(2010) 6(2011) 2(2012) 9(2013)	N.A.	N.A.



33. Diversity of students

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
(refer to question no. 4)				
M.Sc. (H.S.) Biotechnology	80%	20%	Nil	Nil
Ph.D.	45%	14%	20%	8.5%

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

**Total No. of Students who have cleared NET/GATE/DBT/UGC/CISR/LS (2009-13): 43**

35. Student progression

Student progression	Percentage against enrolled
UG to PG	100%
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
Ph.D. to Post-Doctoral	--
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>25%</b>
from other universities within the State	<b>50%</b>
from universities of other states	<b>25%</b>
from universities outside the country	<b>Nil</b>

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 : **Fully functional library of the department**
- b) Internet facilities for staff and students : **Available**
- c) Total number of class rooms : **2**
- d) Class rooms with ICT facility : **No**
- e) Students' laboratories : **2**
- f) Research laboratories : **4**

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	Amanjot	Panjab University, Chd
2	Gurkamal	Panjab University, Chd
3	Himanshu	Panjab University, Chd
4	Naindeep	Panjab University, Chd
5	Nandita Dogra	Panjab University, Chd
6	Neha Lakhnpal	Panjab University, Chd
7	Neha Singh	Panjab University, Chd

8	Neha Singla	Panjab University, Chd
9	Nisha	Panjab University, Chd
10	Pratibha Mann	Panjab University, Chd
11	Rohit Kumar	Panjab University, Chd
12	Savita Bains	Panjab University, Chd
13	Shweta	Panjab University, Chd
14	Stuti Arya	Panjab University, Chd
15	Vibha Mandhan	Panjab University, Chd

b) from other institutions/universities:

➤ **List of Doctoral Students:**

<b>S.No.</b>	<b>Name of the scholar</b>	<b>Institute</b>
1	Akshra	Khalsa College, Chandigarh
2	Anupama Bhardwaj	Khalsa College, Chandigarh
3	Arbind Kumar	Utkal University, Bhubaneshwar
4	Damanjeet Kaur	Khalsa College, Chandigarh
5	Depender Jadeja	Pondicherry University
6	Gaurav Prashar	Bundelkhand University, Jhansi
7	Gurpreet Singh	University of Rajasthan, Rajasthan
8	Hamed Hemati	Iran University, Iran & Kakatiya University, Warangal
9	Javeed Ahmad Bhat	Bangalore University
10	Kaushal Kumar Bhatti	B.H.U., Banaras
11	Manisha	Lovely Professional University, Jalandhar
12	Manpreet Kaur Saini	S.D. College, Chandigarh
13	Marjan Askari	Iran University, Iran

14	Nidhi Bhargava	Panjabi Univ. Patiala
15	Rakesh Kumar	Patna University, Patna
16	Richard Chalo Muoki	Egerton University, Kenya
17	Sajad Shahbazi	Iran University, Iran & Kakatiya University, Warangal
18	Sipla Aggarwal	
19	Sonu Bhatia	S.D. College, Chandigarh
20	Vishal Sharma	Lovely Professional University, Jalandhar
21	Yogesh Gupta	Goa University, Goa

➤ **One Research Associate Dr. Anjani Kumar under DS Kothari Post Doctoral Fellowship**

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

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

**Yes, feedback is taken and changes are made in the curriculum accordingly**

b. 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**

c. 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)

**Prof. R.C. Sobti (Emeritus Prof.)**

44. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts :

S.No.	Title of the Seminar/Conference / Symposia	Date
1.	Chascon – 2009	26 <sup>th</sup> -27 <sup>th</sup> Feb 2009
2.	Recent Advances in Plant Biotechnology	12th March 2010
3.	One day seminar in “Recent Techniques in Biotechnology – 2010”	26th Nov 2010
4.	National Symposium on ‘Frontier in Biotechnology’ at Department of Biotechnology, PU	17 <sup>th</sup> Feb 2011
5.	Chascon – 2011	26 <sup>th</sup> – 28 <sup>th</sup> Feb 2011
6.	Biotechnika 2011	13 <sup>th</sup> – 14 <sup>th</sup> Oct 2011
7.	One day seminar in “Recent Techniques in Biotechnology – 2011”	16 <sup>th</sup> Nov 2011
8.	One day Seminar on Recent Techniques in Biotechnology, 2012 on 15 September 2012 at Department of Biotechnology, PU	15 <sup>th</sup> Sep 2012
9.	Chascon – 2013	1 <sup>st</sup> – 3 <sup>rd</sup> March 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 (More than 50%)**

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

**Faculty delivers extension lectures in different colleges pursuing Biotechnology Course.**

## Extension Lectures (2009-2013)

### Dr. Jagdeep Kaur

1. Genetic Engineering an overview at National Institute of Technical Teachers Training and Research, Sector 26, Chandigarh. Feb 4, 2009
2. **Genetic Engineering an overview** at NATIONAL INSTITUTE OF TECHNICAL TEACHERS' TRAINING AND RESEARCH, SECTOR 26, CHANDIGARH , Feb 4, 2009
3. **Gene Cloning** at Government College Mohali in Workshop for National workshop on Genetic Engineering, May 14-30, 2009
4. rDNA technology in medicine, at NATIONAL INSTITUTE OF TECHNICAL TEACHERS' TRAINING AND RESEARCH, SECTOR 26, CHANDIGARH, Nov 23, 2009
5. Genetic Engineering in Agriculture, at NATIONAL INSTITUTE OF TECHNICAL TEACHERS' TRAINING AND RESEARCH, SECTOR 26, CHANDIGARH, Feb 5, 2010
6. Engineering a metagenome derived lipase towards enhanced thermostability at one day national seminar on New Science horizons at Guru Nanak Khalsa college Yamuna Nagar, Haryana on 24<sup>th</sup> Feb, 2010.
7. rDNA technology, at National Institute of Technical Teachers' Training and Research, Sector 26, Chandigarh , Nov 23, 2010.
8. Gene manipulation at National Institute of Technical Teachers' Training and Research, Sector 26, Chandigarh, Feb 1, 2011
9. Genetic Engineering and Tailored Industrial enzymes in Mata Gujri college, Fatehgarh Sahib, Punjab November 5, 2012
10. Genetically Modified Crops and Food Security at Guru Nanak Khalsa College Yamuna Nagar Feb 28, 2013
11. **Genetic Engineering: an overview** at National Institute of Technical Teachers' Training and Research, **Sector 26, Chandigarh**, Feb 4, 2009.
12. **Gene Cloning** at Government College Mohali in Workshop for National workshop on Genetic Engineering, May 16, 2009
13. **rDNA technology in medicine**, at National Institute of Technical Teachers' Training and Research, Sector 26, Chandigarh (Nov 23, 2009).
14. **Genetic Engineering in Agriculture**, at National Institute of Technical Teachers' Training and Research, Sector 26, Chandigarh (Feb 5, 2010).
15. **Engineering a metagenome derived lipase towards enhanced thermostability** at one day national seminar on **New Science horizons** at Guru Nanak Khalsa college Yamuna Nagar, Haryana on 24<sup>th</sup> Feb, 2010.
16. **Mycobacterial lipid degrading enzymes as a promising vaccine candidates or drug targets.** National Conference on '**Current Trends in Biotechnology-2012 (CTBT-2012)**' at Department of Biotechnology, K.V.A.D.A.V. College For Women, Karnal. Haryana (April 3, 2012).

17. **Genetic Engineering and Tailored Industrial enzymes** at Mata Gujri college, Fatehgarh Sahib, Punjab (November 5, 2012).
18. **Genetically Modified Crops and Food Security** at Guru Nanak Khalsa College Yamuna Nagar (Feb 28, 2013).

#### **Dr. Neena Capalash**

1. Bacterial Conversation at Guru Nanak Girls College ,Ludhiana on Feb 6,2009
2. Quorum sensing a target for anti pathogenic therapy at Deptt of Microbial Biotechnology, PU Chd on 28<sup>th</sup>March,2013

#### **Dr. Neeraj Khullar**

1. Expert lecture on “Immunology in vaccine development ” during STC on “Biosciences & Bionanotechnology “ on 5<sup>th</sup> Feb at NITTR, Sector-26, Chandigarh.
2. “Vaccines-The ultimate weapon” during STC on ‘ Biosciences and Bionanotechnology, 5th Feb,2009 at NATIONAL INSTITUTE OF TECHNICAL TEACHERS’ TRAINING AND RESEARCH, SECTOR 26, CHANDIGARH.
3. “Immunology and its applications for vaccine development”, 26<sup>th</sup> Nov, 2009 In Training program for Engg college teachers “ Interaction on industrial biotechnology and inter microbiology” at NITTR, Chandigarh.
4. “Vaccines--The ultimate weapon” at a refresher course in Biotechnology, National Institute of technical teachers training and research, Chandigarh, Nov 2010.
5. “Application of Immunology for vaccine manufacture”, in course on ‘Biotechnology and Biochemical engineering’ at NITTR, Chandigarh, 25<sup>th</sup> Nov, 2010.

#### **Dr. Jagtar Singh**

1. Concept of immobilization in GGSD College, Sector-32, Chandigarh on December 12, 2012
2. Invite talk on “Immobilization of enzymes for bio-transformation” and conducted a practical on December 22<sup>nd</sup>, 2011 at 2<sup>nd</sup> workshop on Fermentation Process “From Petriplate to Bioreactor” sponsored by DBT New Delhi and organized by GGSD College, Chandigarh from December 14-28, 2011.
3. Invited talk on “Concepts of immobilization” and conducted a practical on December 23<sup>rd</sup>, 2012 at 3<sup>rd</sup> workshop on Fermentation Process “From Petriplate to Bioreactor” sponsored by DBT New Delhi and organized by GGSD College, Chandigarh from December 18-31, 2012.

#### **Dr. Kashmir Singh**

1. Genomic DNA isolation: Principle and procedure, at National Workshop on recombinant DNA technology, Govt. College Mohali.
2. Introduction to Bioinformatics, at National Workshop on recombinant DNA technology, Govt College Mohali.
3. Plant genetic engineering at School of emerging technologies, Sri Guru Granth sahib world university, Fatehgarh Sahib (march 2013).

4. Plant tissue culture; methodology and applications, at School of emerging technologies, Sri Guru Granth sahib world university, Fatehgarh Sahib (April 2012)

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

- **Departmental seminars on recent advances in Biotechnology**

S.No.	Title of the Seminar/Conference / Symposia	Date
1.	Chascon – 2009	26 <sup>th</sup> -27 <sup>th</sup> Feb 2009
2.	Recent Advances in Plant Biotechnology	12th March 2010
3.	One day seminar in “Recent Techniques in Biotechnology – 2010”	26th Nov 2010
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9.	Chascon – 2013	1 <sup>st</sup> – 3 <sup>rd</sup> March 2013

- **Educational visits to National Research Laboratories and Biotechnology Industries**
- **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 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) Biotechnology base in the country and abroad is expanding,. So the scope for the students of Biotechnology is high.
- b) There is a large scope for entrepreneurial 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) Summer training for one month for M.Sc. 1<sup>st</sup> Year students in collaboration with national laboratories to enhance their skill based knowledge is proposed.
- b) In addition, the syllabus will be modified by incorporating the subjects like : GLP (Good Laboratory Practice) & Entrepreneurship.
- c) Research facilities in the department will be upgraded.

