Evaluative Report of the Department - A

1. Name of the Department: School of Biotechnology
2. Year of establishment: 1991
3. Is the Department part of a School/Faculty of the university? Life Science
5. Interdisciplinary programmes and departments involved: M.Sc. Genetic Engineering and Bioinformatics, only School of Biotechnology is involved.
6. Courses in collaboration with other universities, industries, foreign institutions, etc. 15 days hands on training programmes on Biotechnology, sponsored by M.P. Biotechnology Council, Bhopal.
7. Details of programmes discontinued, if any, with reasons: Nil
8. Examination System: Annual/Semester/Trimester/Choice Based Credit System: Semester and also using CBCS.
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)

<table>
<thead>
<tr>
<th>Name of the post</th>
<th>Sanctioned</th>
<th>Filled</th>
<th>Actual (including CAS&amp; MPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>01</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>00</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Asst. Professor</td>
<td>02 (01Gen+01 ST)</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>Others (Contractual Lecturer)</td>
<td>12</td>
<td>08</td>
<td>05</td>
</tr>
</tbody>
</table>
11. Faculty profile with name, qualification, designation and specialization (D.Sc./D.Litt./Ph.D./M.Phil., etc.)

<table>
<thead>
<tr>
<th>Name</th>
<th>Qualification</th>
<th>Designation</th>
<th>Specialization</th>
<th>No. of Years of Experience</th>
<th>No. of Ph.D. students guided for the last 4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Anil Kumar</td>
<td>Ph.D.</td>
<td>Professor</td>
<td>Enzyme Technology Gen Eng. &amp; Mol.Bio.</td>
<td>33 years</td>
<td>07 (Ph.D.s)</td>
</tr>
<tr>
<td>Dr. H.S. Parmar</td>
<td>Ph.D.</td>
<td>Lecturer</td>
<td>Medical and Animal Biotechnology</td>
<td>04 years</td>
<td>43 M. Sc. dissertations</td>
</tr>
</tbody>
</table>

12. List of senior Visiting Fellows, adjunct faculty, emeritus professors
Dr. Govindjee, Emeritus Professor, Albana University, USA. Delivered a lecture on 19th Oct. 2012.

13. Percentage of classes taken by temporary faculty – programme-wise information
   ~68 % in Biotechnology
   ~ 78 % in Genetic Engineering
   ~ 80 % in Bioinformatics

14. Programme-wise Student Teacher Ratio: 10:1

15. Number of academic support staff (technical) and administrative staff: sanctioned, filled and actual
   04 technical staff (Contractual in Bioinformatics sub-centre) and 01 Office Assistant.

16. Research thrust areas as recognized by major funding agencies
   Enzyme technology
   Bioinformatics
   Drug discoveries and therapeutics
   Plant Biotechnology
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.

Dr. Anil Kumar (PI)

(1) M.Sc. Biotechnology Program sponsored from DBT, New Delhi (since 1991 till to date). Total grant received so far is approx. 2 Crores.

(2) Bioinformatics sub-centre: Total grant received till to date is approx. 2 crore.

(3) Purification, characterization and immobilization of starch phosphorylase and amylase from sorghum DST project.

(4) Purification, characterization and immobilization of pectinase and cellulase enzymes CSIR project.

(5) Purification and characterization of starch phosphorylase from a C4 plant leaf MPCOST project.

(6) Assistance for up-grading Biotechnology facilities- MPCOST project (costing Rs. 12,00000/-).

(7) Dr. Krityanand Kumar Mahatman DBT-TWAS Fellowship- TWAS-DBT project


Dr. H.S. Parmar (Ongoing/ Sanctioned)

(1) A Major research project “Evaluation of small polyphenolic compounds for their potential anti-obesity effects” from UGC 2013 for three years. Grant of Rs. 9,33,800/- (2013-2016)

(2) Evaluation of herbal extract on OVA induced allergic rhinitis. Grant of Rs. 3,00000/- (04 months duration).

18. Inter-institutional collaborative projects and associated grants received

a) National collaboration

b) International collaboration

a) National collaboration:

1. NCCS, Pune.
2. National Research & Development Corp., New Delhi
4. Institute of Transgene Life Sciences, Lucknow
5. Jain Irrigation Systems Ltd., Jalgaon
6. NEERI, Nagpur

Evaluate SSR Report of School of Biotechnology

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b) International collaboration

1. MOU signed for research collaboration with Institute of Animal Physiology and Genetics, Libechov, Czech Republic.
2. Collaboration is in progress with Kunk University, Korea.
3. Collaboration for summer training programme with University of Poiters, France.
4. University of Saskatchewan, Canada.

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

1. M.Sc. Biotechnology Program sponsored from DBT, New Delhi (since 1991 till to date). Total grant received so far is approx. 2 Crores.

2. Bioinformatics sub-centre: Total grant received till to date is approx. 2 crore.

3. Assistance for up-grading Biotechnology facilities, grants of Rs. 12,00,000/- from MPCOST, Bhopal.

4. Research facility / centre with

   a. state recognition: Bioinformatics sub-centre
   b. national recognition: Recognized for quality of research
   c. international recognition: Recognized for quality of research

21. Special research laboratories sponsored by / created by industry or corporate bodies:
    Herbakraft, USA offered for the funding of Rs. 3,00,000/- to Dr. H.S. Parmar to work in collaboration.

22. Publications:

   - Number of papers published in peer reviewed journals (national / international): 135
     - Monographs: 03
     - Chapters in Books: 10
     - Edited Books: 10
     - Number listed in International Database (For e.g. Web of Science, Scopus, Humanities International Complete, Dare Database - International Social Sciences Directory, EBSCO host, etc.): All the papers listed in one or the other Database.
     - Citation Index – range / average: Dr. Anil Kumar: 20
       - Dr. H.S. Parmar: 08 (as per Scopus) and 12.5 (as per Google Scholar)
   - SNIP: Not known
   - SJR: Not known

   - Impact Factor – range / average: Dr. Anil Kumar: ~200 (Cumulative) and 1.732 (Average)
     - Dr. H.S. Parmar: 40
**h-index:**

- Dr. Anil Kumar: 20
- Dr. H.S. Parmar: 08 (as per Scopus) and 12.5 (as per Google Scholar)

LIST OF PUBLICATIONS (2007-2013): 61


Evaluate SSR Report of School of Biotechnology

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somaclones of Veronia cinerea. *Genes Genomes Genomics* 4, 58-64.


23. Details of patents and income generated: Nil

24. Areas of consultancy and income generated: Academic-industry collaboration to Dr. H.S. Parmar from Herbakraft, USA for Rs. 3,00000/-.

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

1. Dr. Anil Kumar has been awarded Biotechnology Overseas Associateship from DBT. He availed the Associateship from Oct., 2003 to January , 2004 (in Jack Preiss Lab, MSU, USA).

26. Faculty serving in

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

Yes, Dr. Anil Kumar is member of several committees meant to design syllabus for DBT, New Delhi and many other Universities. Examination observer and decision on the paper pattern. Dr. H.S. Parmar is also expert at VYAPAM, Bhopal.

Evaluate SSR Report of School of Biotechnology
Dr. Anil Kumar and Dr. H.S. Parmar are reviewers of various National and International journals.

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

1. Dr. H.S. Parmar (lecturer) successfully completed 21 days long Refresher cum Orientation course on Disaster Management (June 18, 2013 to July 08, 2013).

2. Dr. H.S. Parmar (lecturer) successfully completed 21 days long Refresher course (January 02, 2013 to January 22, 2013).

3. Dr. H.S. Parmar also attended 06 days long UGC Sponsored workshop at Jamia Hamdard University, in 2010.
28. Student projects

percentage of students who have done in-house projects including inter-departmental projects

- 100% Biotechnology Students
- 50% Genetic Engineering
- 60% Bioinformatics

percentage of students doing projects in collaboration with other universities

industry / institute

- 50% Students of Genetic Engineering
- 40% Students of Bioinformatics

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

- Faculty
- Dr. Anil Kumar
  - Dr. Anil Kumar is founder Professor and Head of School of Biotechnology. His unique work has made School of Biotechnology Nationally as well as internationally recognized institution.
  - He is senior most Professor of Biotechnology in the entire MP.
  - He is Officer Incharge of Bioinformatics Sub Center at the University. The center is sponsored by the Department of Biotechnology, Govt. of India, New Delhi.
  - Dr. Anil Kumar has published number of research papers in various reputed National and international journals. He has also produced 25 Ph.Ds. At present several Ph.D students are working under his supervision.
  - He and his team developed various low cost technologies.
• Various numbers of times he has been expert member in the Ministry of Human Resource development, Govt. of India, New Delhi for the selection of candidates for Japan, Russia, Australia, Germany and Commonwealth etc.

• He has been expert (Governor’s/Chancellor’s nominee) in the selection of teachers (Professors, Readers, Lecturers) in number of universities.

• Dr. Anil Kumar is member of Advisory board for the book ‘Dictionary of Biotechnology’ authored by Somani.

• Dr. Anil Kumar is Chairperson of Board of Studies of Biotechnology, Devi Ahilya University, Indore.

• Dr. Anil Kumar has been External member on the Board of Studies in Biotechnology at Amravati University, Amravati.

• Dr. Anil Kumar has been External member on the Faculty board of Life Science, Jiwaji University, Gwalior.

• Dr. Anil Kumar is Convener Indore Chapter and life member of Society of Biological Chemists, Plant Research, and Indian Science Congress Association, India

• Dr. Anil Kumar has received Distinguished Leadership award of American Biographical Institute and has been nominated as Deputy Governor in their Board.

• Due to his contributions to Biotechnology, Dr. Anil Kumar’s name has been included in the International Directory published by The American Chemical Society, USA.

• Dr. Anil Kumar has been expert member of the Standing Committee of the Madhya Pradesh State Government.

• Dr. Anil Kumar has been elected Senate member for Devi Ahilya University Court.

• Dr. Anil Kumar has been external member on the Post Graduate Board of Studies in Biotechnology at Nagarjuna University, Nagarjuna Nagar, Guntur.
• Dr. Anil Kumar is member of various International Societies like New York Academy of Sciences, USA, Bioencapsulation Research Group, France.

• He has been member of Biotechnology Club, BCIL, New Delhi.


• CIMAP Lucknow (an organization of CSIR, New Delhi) felicitated Dr. Anil Kumar for his valuable contributions in the field of Biotechnology.

• Dr. Anil Kumar was awarded Fellow of the Year 2000 by the Society of Plant Research.

• Dr. Anil Kumar has collaborations with other National Research Laboratories. He is having collaborations with CIMAP, Lucknow; NCCS, Pune.

• Dr. Anil Kumar's name has been included in the book 'Curriculum Vitae International' of International Biographical Research Foundation.

• Dr. Anil Kumar’s name has been included in Marquis Who’s Who, Asian/American Who’s Who and in many other publications.

• He is also engaged in social and charity services.

• He has been member (2009-2012) of the Executive Council of Devi Ahilya University, Indore.

• He is life member of Biotechnology Society of India, member of the Society for Bioscience and Bioengineering, Japan and member of the American Society of Biochemistry and Molecular Biology and member of the American Chemical Society.
- He has been awarded Biotechnology Overseas Associateship from DBT. He availed the Associateship from Oct., 2003 to January, 2004 (in Jack Preiss Lab, MSU, USA)

- He was nominated member, International Scientific Committee of 4th World Congress of Cellular and Molecular Biology Society held on October 7-12, 2005 at Poitiers, France. He also chaired a Symposium entitled ‘Enzymes of carbohydrate metabolism and their exploitation in biotechnology’ in the Congress.

- He has been nominated President for the Society for Science & Environment for the year 2007. He was Vice-President of the Society for the year 2006.

- He has organized and hosted National Conference on Biotechnology, Science & Environment on Dec. 28-29, 2006 at the School of Biotechnology of the University.


- He was the Organizer & President of the 5th World Congress of Cellular and Molecular Biology held on Nov. 2-6, 2009 at the Devi Ahilya University, Indore, India (jointly in collaboration of World Society for Cellular & Molecular Biology).

- He has been offered Honorary Fellowship of Association of Biotechnology & Pharmacy, and World Society of Cellular & Molecular Biology, France

Dr. H.S. Parmar:

Best Science Research Award-2009-2010 sponsored from M.P.C.S.T., Bhopal.

- Awarded UGC-Major Research Project-2013
- Awarded a project from Herbakraft, NJ, USA.

- Doctoral / post doctoral fellows: Nil

- Students: Received 8th rank in ABLE-BEST-2011.
<table>
<thead>
<tr>
<th>Year</th>
<th>National</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-08</td>
<td>Workshop on Bioinformatics for genomics and proteomics data analysis (Oct 29-Nov 02, 2007)</td>
<td></td>
</tr>
<tr>
<td>2008-09</td>
<td>Workshop on machine learning techniques for bioinformatics data analysis (04-08, Nov, 2008)</td>
<td>5th World Congress of Cellular and Molecular Biology (02-06, Nov, 2009)</td>
</tr>
<tr>
<td>2009-10</td>
<td>Workshop on structural Bioinformatics and system biology (25-27, Nov, 2009)</td>
<td></td>
</tr>
<tr>
<td>2010-11</td>
<td>Workshop on computational Biology and Molecular Dynamics (20-22, Jan, 2011)</td>
<td></td>
</tr>
<tr>
<td>2011-12</td>
<td>National Seminar on Industrial facet of Biotechnology (24-25 Jan, 2012)</td>
<td></td>
</tr>
<tr>
<td>2012-13</td>
<td>World Ocean Day (8th June 2013)</td>
<td></td>
</tr>
</tbody>
</table>
31. Code of ethics for research followed by the departments
   (1) Follow guidelines of CPCSEA and institutional ethical committee to perform experimentation on laboratory animals (mice and rats).
   (2) Not using any radioactive and genetic materials that need additional biosafety.
   (3) Extreme care in handling health hazardous chemicals.
   (4) No plagiarism and no copy paste in manuscripts and theses.
   (5) Working on the topics closely associated with the direct benefits to society and end users including enzyme technologies, agricultural aspects, understanding of pathologies and drug discovery & therapeutics.
   (6) All research papers in good journals.

32. Student profile programme-wise: 2013-14

<table>
<thead>
<tr>
<th>Name of the Course (refer to question no. 4)</th>
<th>Applications received</th>
<th>Selected Male</th>
<th>Selected Female</th>
<th>Pass percentage in qualifying UG examinations Male</th>
<th>Pass percentage in qualifying UG examinations Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>JET (Joint entrance Test) for M.Sc.</td>
<td>On an average 8000-10000 students</td>
<td>Biotech: 7M 19F</td>
<td>55%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Biotech (industry), Genetic Engineering and Bioinformatics and CEEB (conducted through JNU, New Delhi) appear in CEEB and 100-300 for JET

<table>
<thead>
<tr>
<th>G.E.</th>
<th>9M 10F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioinfo.</td>
<td>9M 8F</td>
</tr>
</tbody>
</table>

33. Diversity of students

<table>
<thead>
<tr>
<th>Name of the Programme (refer to question no. 4)</th>
<th>% of students from same University</th>
<th>% of students from other Universities within the State</th>
<th>% of students from other Universities outside the State</th>
<th>% of students from other Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.Sc. Biotechnology</td>
<td>42.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.Sc. Genetic Engineering</td>
<td>94.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.Sc. Bioinformatics</td>
<td>88.23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

34. How many students have cleared Civil Services and Defense Services examinations, NET, SET, GATE and other competitive examinations? Give details category-wise.

UGC NET / SLET (Since 2011-12)

<table>
<thead>
<tr>
<th>Name of examination</th>
<th>% of students appeared</th>
<th>% of students qualified</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSIR-UGC-NET</td>
<td>95 (ELIGIBLE STUDENTS)</td>
<td>30</td>
</tr>
<tr>
<td>GATE</td>
<td>95 (ELIGIBLE STUDENTS)</td>
<td>70</td>
</tr>
<tr>
<td>TIFR/NCBS/IGIB/AIIMS/DBT-JRF/ IISc/ IITs/ IARI/DSR/ICAR/IISER</td>
<td>75(ELIGIBLE STUDENTS)</td>
<td>~57</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>GRE/TOEFL</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

35. Student progression

<table>
<thead>
<tr>
<th>Student progression</th>
<th>Percentage against enrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>UG to PG</td>
<td>NA</td>
</tr>
<tr>
<td>PG to M.Phil.</td>
<td>NIL</td>
</tr>
<tr>
<td>PG to Ph.D.</td>
<td>68.8</td>
</tr>
<tr>
<td>Ph.D. to Post-Doctoral</td>
<td>20</td>
</tr>
<tr>
<td>Employed</td>
<td></td>
</tr>
<tr>
<td>Campus selection</td>
<td></td>
</tr>
<tr>
<td>Other than campus recruitment</td>
<td>~30</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>~1-2</td>
</tr>
</tbody>
</table>

36. Diversity of staff

| Percentage of faculty who are graduates |
|---|---|
| of the same university | 77.77 |
| from other universities within the State | |
| from universities from other States | 22.23 |
| 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

01 (Dr. H.S. Parmar in Aug 13, 2009)

38. Present details of departmental infrastructural facilities with regard to

a) Library: SoBT departmental library has more than 3000 books relevant to biotechnology, genetic engineering and bioinformatics. SoBT has access to International journals for example, NATURE, Animal Tissue Culture and Cell Science, and Journal of Bioscience and Bioengineering etc.

b) Internet facilities for staff and students: 36 desktop; 05 laptop; 02 notebooks; 01 workstation; 06 printers; 02 scanners and 01 photocopier for students and staff. All the systems having access of Internet facilities.
c) Total number of class rooms: 05

d) Class rooms with ICT facility: 05

e) Students’ laboratories: 06

f) Research laboratories: 04

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

a) from the host institution/university
   1. Ms. Shivani Bhagwat
   2. Ms. Ritu Jain
   3. Mr. Rupesh Chawda
   4. Mr. Prashant Chaursia
   5. Mukesh Patidar

a. from other institutions/universities
   6. Ms. Neha Barve
   7. Ms. Sonia Raghuvanshi
   8. Mr. Gaurav Singh
   9. Ms. Pratibha Maravi
  10. Ms. Ranjeeta Chauhan

11. Number of post graduate students getting financial assistance from the university.
Our M.Sc. program is funded by DBT, New Delhi and the students enrolled through JNU entrance getting fellowship of Rs. 3000/-p.m. The total students getting this fellowship are 19.

Besides, SC/ST/ OBC students are getting fellowships from State government. The total number of students is 20.

12. Was any need assessment exercise undertaken before the development of new programme(s)? If so, highlight the methodology.
Need assessment was done on the basis of the suggestions of the experts, students and stakeholders. Various aspects have discussed with experts such as changing need of time, requirement of the corporate sector and National level examination. The issues are then
discussed in departmental committee meetings for the need of changing the syllabus or introducing a new programme.

13. Does the department obtain feedback from: Yes

i. faculty on curriculum as well as teaching-learning-evaluation? If yes, how does the department utilize the feedback?
Department uses the feedback as indicator of the overall quality of the teaching and learning and change the methods of teaching and also the syllabi.

ii. students on staff, curriculum and teaching-learning-evaluation and how does the department utilize the feedback?
School uses feedback for infrastructure, behaviour of the staff and faculties to students implement the changes required.

iii. alumni and employers on the programmes offered and how does the department utilize the feedback?
Department improves the program by incorporating the suggestions from feedbacks.

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

1. Dr. Rajesh K. Saini, Faculty USA (1993).
3. Dr. B. Venkaiah, Faculty USA (1995).
6. Dr. Sumati Mattoo, USA(2004).
7. Dr. Divya Sinha, Iowa State University, USA (2005).
9. Dr. Sarika Garg, Postdoc, Canada (2007).
12. Mr. Amit Tripathi, ICGEB, New Delhi (2010).

14. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts.
   2. National Seminar on Industrial Facet of Biotechnology (2012): the experts from corporate sector delivered the lectures on Drug Discoveries
   3. Lecture on how to grab opportunities for PhD. in USA from Senior Advisor Higher Education, India domain, Govt. of USA (2012).
   5. Lectures from Gynecologists and Obstetrics for Girl students (17.01.2013).

15. List the teaching methods adopted by the faculty for different programmes.
   16. Teaching of advanced topics in details by using International research articles and online books including but not limited to:
      17. a. The role of miRNA maintaining pluripotency of stem cells.
      18. b. Tissue engineering technologies with reference to bioprinting.
      19. c. Gene silencing
      20. d. Cellular reprogramming
      21. e. Presentation literature to students on nuclear translation, prodrug therapy and riboswitches.
      23. g. To improve communication and research skills, presentations delivered by students on research topics.

24. Web references:
   26. www.pubmed.com
   27. http://scholar.google.co.in/
   28. http://highered.mcgraw-
30. How does the department ensure that programme objectives are constantly met and learning outcomes are monitored?

The basic objectives of SBT syllabi are to enhance the theoretical and practical understanding as well as skills of students in the area of advance biological sciences. We are shaping the career of students by which after the completion of their course they absorb in higher education, government and corporate sectors. It is also noteworthy that we are not only developing professional competencies, but also shape overall personality of students to become a responsible citizen of country. The outcomes monitored in the form student placement profile (copy enclosed).

31. Highlight the participation of students and faculty in extension activities. Department students participate in every work of the department through various departmental committees. In fact, we take their advice and suggestions to design syllabus, time table and examinations schedule. We also implicated green policy out of which Environment, cleanliness and oceans day were celebrated to spread awareness. We also organized AIDS awareness day (File No. 23).

48. Give details of “beyond syllabus scholarly activities” of the department.
   Participation in various conferences, seminars and lectures.
   b. Hands on training of *in silico* biology.
   c. 15 days long hands on training on enzyme technology being conducted for M.Sc. Students selected from M.P. Biotechnology Council, Bhopal (June 13 to June 28, 2012).

   15 days long hands on training on enzyme technology being conducted for M.Sc. Students selected from M.P. Biotechnology Council, Bhopal (July 15 to July 29, 2013).
   a. Students counseling on the personal problems, life style, career and to teach them to become good human being is done by mentor faculty and HOD.
   b. International research publications of P.G. students in good impact journals.
State whether the programme/ department is accredited/ graded by other agencies? If yes, give details. No.

49. Briefly highlight the contributions of the department in generating new knowledge, basic or applied.
   2. Research projects undertaken:
   3. 1. Lab scale technology for glucose-1-phosphate production.
   4. 2. Low methoxyl pectin production.
   5. 3. Low molecular weight polygalacturonic acid production.
   6. 4. Immobilization technologies.
   7. 5. Plant tissue culture technologies.
   8. 6. Basic understanding of metabolic disorders.
   9. 7. Drug discoveries & therapeutics development.
   10. 8. Development of tools and information using bioinformatics research such as DEMP (database of epitopes and MHC binding peptides); SSPred; Predict Bias; GGRP; MT Genome DB; Orchid DB; PCR RECEIPE; OLERA and TAXON etc.

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

   Strengths:
   • International and National collaborations
   • Students placement in National and International Institutions, companies
   • Renowned Professor heading the School research laboratories
   • Access of each laboratory for everyone.
   • Student participation in policy decisions.

   Weaknesses
   • Requirement of additional permanent teaching faculties.
   • Supporting and administrative staff needs to be appointed.
   • Present University and State Govt. rules are out of context and needs to be in line with International practices.
   • Decreasing number of students pursuing Science.
   • Shrinking of opportunities in the area of Biological sciences.
Opportunities

- International and National collaborations will improve research standards and opportunities to students.
- Research skills and aptitude of faculty and students will further improve the quality of teaching and research.
- Sandwich Ph.D. programme of various funding agencies will be beneficial to start the consultancy services from Corporate.
- Adjunct Faculty positions of funding agencies like DST can improve teaching standards.
- International fellowships for the Faculty will enhance the communication and research skills further.

Challenges:

Recruitment of permanent faculty members is an urgent need of the department.

- Procedural delay should be greatly improved.
- Proper implementation of leave rules required to avail research fellowships.
- Institutional subscription required to access National and International research journals.
- Lack of motivation for science among students.
Write up of efforts for Quality Sustenance and Assurance in the department- B

SoBT continuously makes efforts towards maintaining the quality by promoting research and quality of teaching. This is further substantiated by the research publications of students during M.Sc. It is very significant achievement for department and University.

Besides, during student and teacher meetings SBT makes the students aware to study, plan the strategies to crack competitive examinations including NET, GATE, ICMR and specific exams for premier research institutes. Department hosted workshop and conference on Fostering research excellence at University level.

SBT has also recruited number of temporary faculty members (contract). Bioinformatics sub-centre staff also contributes to support teaching and research to students. Recruitment is as per qualifications and UGC regulations.
Declaration by the Head of the Department - C

I certify 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 institution

[Signature]

Place: Indore
Date: 23.08.2013

Evaluate SSR Report of School of Biotechnology