
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
4. Names of programmes offered (UG, PG, M.Phil., Ph.D., Integrated Masters; Integrated Ph.D., D.Sc., D.Litt., etc.): Masters in Biotechnology, Genetic Engineering and Bioinformatics and Ph.D. in Biotechnology.
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)

Name of the post	Sanctioned	Filled	Actual (including CAS& MPS)
Professor	01	01	01
Associate Professor	00	00	00
Asst. Professor	02 (01Gen+01 ST)	01	01
Others (Contractual Lecturer)	12	08	05

11. Faculty profile with name, qualification, designation and specialization (D.Sc./D.Litt./ Ph.D./M.Phil., etc.)

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

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
- (8) Dr. Abebe Girma Demissie from Ethiopia for postdoctoral Fellowship under CV Raman International Fellowship for African Researchers (2013-2014).

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
3. Centre for Genomics & Applied Gene Technology ,Institute of Integrated Omics & Applied Biotechnology Purba Medinipur
4. Institute of Transgene Life Sciences, Lucknow
5. Jain Irrigation Systems Ltd., Jalgaon
NEERI, Nagpur

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 Poitiers, 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. 12,00000/- 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. 3,00000/- 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
 - Books with ISBN with details of publishers: Available in detailed list.
 - 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

(Cumulative and 2.5 Average)

* 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

1. Parmar HS, Kar A. Antidiabetic potential of *Citrus sinensis* and *Punica granatum* peel extracts in alloxan treated male mice. *Biofactors*. 2007; 31:17-24 (IF:4.933).
2. Parmar HS, Kar A. Atherogenic diet induced diabetes mellitus: involvement of thyroid hormones. *Eur J Pharmacol*. 2007; 570: 244-8 (IF:2.728).
3. Jatwa R, Parmar HS, Panda S, Kar A. Amelioration of corticosteroid-induced type 2 diabetes mellitus by rosiglitazone is possibly mediated through stimulation of thyroid function and inhibition of tissue lipid peroxidation in mice. *Basic Clin Pharmacol Toxicol*. 2007; 101 (3):177-80 (IF:2.179).
4. Krishna N, Mohan S, Yashavantha BS, Rammurthy A, Kiran Kumar HB, Mittal U, Tyagi S, Mukerji M, Jain S, Pal PK, Purushottam M. SCA 1, SCA 2 & SCA 3/MJD mutations in ataxia syndromes in southern India. *Indian J Med Res*. 2007; 126: 465-70.
5. Garg, S, Sohani, N., Pundhir, S. and Kumar, A. (2007) Primer designing for Endo-1, 4- β -Xylanase gene. *J. Cell Tissue Res*. 7, 1147-1154.
6. Maheshwari, P., Songara, P., Kumar, S., Jain, P., Srivastava, K. and Kumar, A. (2007) Alkaloid production in *Vernonia cinerea*: Callus, cell suspension and root cultures. *Biotechnology Journal*. 2, 1026-1032..
7. Maheshwari, P., Garg, S., Sood, P.P. and Kumar, A. (2007) Xylanase: A biotechnological perspective. *VAK* 2, 44-56.
8. Garg, S. and Kumar, A. (2007) Immobilization of starch phosphorylase from seeds of Indian millet (*Pennisetum typhoides*) variety KB 560. *African J. Biotech.* 6, 2715-2720.
9. Garg, N. and Kumar, A. (2008) Immobilization of starch phosphorylase from cabbage leaves: Production of glucose-1-phosphate. *Brazilian J. Chem. Eng.* 25, 229-235.

10. Pundhir, S., Vijayvargiya, H. and Kumar, A. (2008) PredictBias: a server for the identification of genomic and pathogenicity islands in prokaryotes. In *Silico Biology* 8, 223-234.
11. Garg, N., Pundhir, S., Prakash, A. and Kumar, A. (2008) Primer designing for *DREB1A*, A cold induced gene. *J. Proteomics Bioinformatics* 1, 37-46.
12. Maheshwari, P., Garg, S. and Kumar, A. (2008) Taxoids: Biosynthesis and *in vitro* production. *Biotechnology Molecular Biology Reviews* 3(4), 71-87.
13. Garg, N., Pundhir, S., Prakash, A. & Kumar, A. (2008) PCR Primer Design: DREB Genes *J. Comp. Sci. Syst. Biol.* 1, 21-40.
14. Parmar HS, Kar A. Medicinal values of fruit peels from *Citrus sinensis*, *Punica granatum*, and *Musa paradisiaca* with respect to alterations in tissue lipid peroxidation and serum concentration of glucose, insulin, and thyroid hormones. *J Med Food*. 2008 ; 11: 376-81 (IF: 1.408).
15. Parmar HS, Kar A. Antiperoxidative, antithyroidal, antihyperglycemic and cardioprotective role of *Citrus sinensis* peel extract in male mice. *Phytother Res*. 2008; 22: 791-5 (IF: 2.086).
16. Parmar HS, Kar A. Possible amelioration of atherogenic diet induced dyslipidemia, hypothyroidism and hyperglycemia by the peel extracts of *Mangifera indica*, *Cucumis melo* and *Citrullus vulgaris* fruits in rats. *Biofactors*. 2008; 33:13-24(IF: 4.933).
17. Parmar HS, Kar A. Protective role of *Mangifera indica*, *Cucumis melo* and *Citrullus vulgaris* peel extracts in chemically induced hypothyroidism. *Chem Biol Interact*. 2009 ;177: 254-8(IF: 2.967).
18. Parmar HS, Kar A. Comparative analysis of free radical scavenging potential of several fruit peel extracts by *in vitro* methods. *Drug Discov Ther*. 2009; 3:49-55.
19. Garg, S., Ali, R. and Kumar, A. (2009) Production of Alkaline Xylanase by an Alkalophilic Bacteria, *Bacillus halodurans*, MTCC 9512 Isolated from Dung. *Curr. Trends Biotech. Pharm.* 3, 90-96.
20. Rathore, R. S., Garg, N., Garg, S. and Kumar, A. (2009) Starch Phosphorylase: Role in Starch Metabolism and Biotechnological Applications. *Critical Rev. Biotechnology* 29, 214-224.
21. Kumar, S., Mishra, R.K., Kumar, A. And Chaudhary, S. (2009) Mapping of the multifoliate pinna (mfp) leafblade morphology mutation in grain pea (*Pisum sativum*). *J. Genetics* 88, 227-232..

22. Mishra, R.K., Chaudhary, S., Kumar, A. and Kumar, S. (2009) Effects of MULTIFOLIATE-PINNA, TENDRILL-LESS and UNIFOLIATA genes on leafblade architecture in *Pisum sativum*. *Planta* 230, 177-190.
23. Barh, D. and Kumar, A. (2009) *In silico* Identification of candidate drug and vaccine targets from various pathways in *Neisseria gonorrhoeae*. *In Silico Biology* 9, 225-231..
24. Kumar, S., Mishra, R. K., Kumar, A., Srivastava, S. and Chaudhary, S. (2009) Regulation of stipule development by COCHLEATA and STIPULE-REDUCED genes in peas *Pisum sativum*. *Planta* 230, 449-458.
25. Maheshwari, P. and Kumar, A. (2009) Antimicrobial activity of *Abelmoschus moschatus* leaf extracts. . *Curr. Trends Biotech. Pharm.* 3, 260-266..
26. Barh, D., Kumar, A., Chatterjee, S. And Liloglou, T. (2009) Molecular features, markers, drug targets and prospective therapeutics in cardiac myxoma. *Current Cancer Drug Targets*, 9, 705-716.
27. Barh, D., Kumar, A. and Misra, A.N. (2009) Genomic Target Database (GTD): A database of potential targets in human pathogenic bacteria. *Bioinformation* 4, 50-51.
28. Chaudhary, N., Mahajan, L., Madan, T., Kumar, A., Raghav, G.P.S., Katti, S.B., Haq, W. and Sarma, P. U. (2009) Prophylactic and therapeutic potential of Asp fl epitopes in naïve and sensitized BALB/e mice. *Immune Network* 9, 179-191.
29. Parmar HS, Kar A, Dixit Y. Fruit and vegetable peels: Paving the way towards the development of new generation therapeutics. *Drug Discov Ther.* 2010;4:314-25.
30. Dhote, M., Juwarkar, A., Kumar, A., Kanade, G. S. and Chakrabarti, T. (2010) Biodegradation of chrysene by the bacterial strains isolated from oily sludge. *World J Microbiol. Biotechnol.* 26, 329-335.
31. Barh, D., Misra, A. N. and Kumar, A. (2010) *In Silico* Identification of dual ability of N. gonorrhoeae ddl for developing drug and vaccine against pathogenic Neisseria and other human pathogens. *J. Proteomics Bioinformatics* 3, 082-090. doi: 10.4172/jpb.1000125
32. Barh, D., Misra, A. N. ,Kumar, A. And Vasco, A. (2010) A novel strategy of epitope design in *Neisseria gonorrhoeae*. *Bioinformation* 5, 77-85
33. Mahatman, K.K. and Kumar, A. (2010) Xylanase production using alkalo-thermophilic *Bacillus halodurans* KR-1 by solid state fermentation. *Curr. Trends Biotechnol. Pharmacy* 4, 871-880.
34. Mahatman, K.K., Garg, N., Chauhan, R. And Kumar, A. (2010) Production, purification and characterization of xylanase using alkalo-thermophilic *Bacillus halodurans* KR-1. *Iranica. J. Energy Environ.* 1, 265-274.
35. Maheshwari, P. and Kumar, A. (2010) RAPD analysis of UB-B induced variation in

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

36. Barh, D., Tiwari, S., Jain, N., Ali, A., Santos, A.R., Misra, A.N., Azevedo, V. and Kumar, A. (2011) In silico subtractive genomics for target identification in human bacterial pathogens. *Drug Development Res.* 72, 162-177
37. Sethi, A., Parmar, H.S. and Kumar, A. (2011) Atherogenic diet induced diabetic mellitus: Antidiabetic role of aspirin. *Basic Clin. Pharmacol. Toxicol.* 108, 371-377(IF: 2.179).
38. Jain M, Parmar HS. Evaluation of antioxidative and anti-inflammatory potential of hesperidin and naringin on the rat air pouch model of inflammation. *Inflamm Res.* 2011 ;60:483-91(IF: 2.109).
39. Barh, D., Jain, N., Tiwari, S., D'Afonseca, V., Li, L., Ali, A., Santos, A.R., Guimaraes, L.C., Soares, S.D.C., Miyoshi, A., Bhattacharjee, A., Misra, A.N., Silva, A., Kumar, A. and Azevedo, V. (2011) A novel comparative genomics analysis for common drug and vaccine targets in *Corynebacterium pseudotuberculosis* and other CMN group of human pathogens. *Chemical Biol. Drug Design* 78, 73-84.
40. Pundhir, S. and Kumar, A. (2011) SSPred: A prediction server based on SVM for the identification and classification of proteins involved in bacterial secretion systems. *Bioinformatics* 6, 380-382.
41. Cerdeira LT, Schneider MP, Pinto AC, de Almeida SS, dos Santos AR, Barbosa EG, Ali A, Aburjaile FF, de Abreu VA, Guimarães LC, Soares Sde C, Dorella FA, Rocha FS, Bol E, Gomes de Sá PH, Lopes TS, Barbosa MS, Carneiro AR, Jucá Ramos RT, Coimbra NA, Lima AR, Barh D, Jain N, Tiwari S, Raja R, Zambare V, Ghosh P, Trost E, Tauch A, Miyoshi A, Azevedo V, Silva A, Complete genome sequence of *Corynebacterium pseudotuberculosis* strain CIP 52.97, isolated from a horse in Kenya. *J Bacteriol.* 2011 Dec;193(24):7025-6. doi: 10.1128/JB.06293-11. GenBank: CP003061.
42. Cerdeira LT, Pinto AC, Cruz Schneider MP, Silva S, Santos AR, Vieira Barbosa EG, Ali A, Barbosa MS, Carneiro AR, Jucá Ramos RT, Santos O, Barh D, Barve N, Zambare V, Estevão S, Guimarães LC, de Castro S, Dorella FA, Rocha FS, Augusto V, Tauch A, Trost E, Miyoshi A, Azevedo V, Silva A. [2011]. Whole genome sequence of *Corynebacterium pseudotuberculosis* PAT10 of strain isolated from sheep in Patagonia, Argentina. *Journal of Bacteriology*, 193(22):6420-1. [PubMed: 22038974] [IF: 3.92].
43. Silva A, Ramos R, Carneiro A, Almeida S, Barbosa S, Pinto AC, Cerdeira L, Santos A, Soares S, Guimaraes L, Barbosa E, Figueira F, Souza F, Abreu VC, Dorella F, Pacheco L, Ghosh P, Zambare V, Barve N, Tiwari S, Barh D, Miyoshi A, Schneider MP, and Azevedo V. *Corynebacterium pseudotuberculosis* 316, complete genome. GenBank: CP003077.1

44. Barh D, Jain N. A novel omics strategy to identify biomarkers for early diagnosis and classification of lung cancer. *Journal of Thoracic Oncology*, 2012, 7 (11), S5, Page No-S471 [Impact Factor: 3.66].
45. Hollmann, A., Saviello, M., Delfederico, L., Luerce, T.D., Barh, D., Jain, N., Tiwari, S., Chandra, S., Gupta, K.K., Zambare, V., Kumar, A., Christopher, L., Misra, A.N., Kumavath, R.N. Azevedo, V., Semorile, L., Miyoshi, A. (2012) Tight controlled expression and secretion of *Lactobacillus brevis* SlpA in *Lactobacillus lactis*. *Biotechnology Letters*. 34, 1275-1281.
46. Sharma, M. and Kumar, A. (2012) Optimization of xylanase secretion from *Paenibacillus macquariensis*. *Curr. Trends Biotechnol. Pharmac.* 6, 190-195.
47. Parmar, H.S., Jain, P., Chauhan, D.S., Bhinchar, M.K., Munjal, V., Yusuf, M., Choube, K., Tawani, A., Tiwari, V., Manivannam, E. and Kumar, A. (2012) DPP-IV inhibitory potential of naringin : An in silico, in vitro and in vivo study. *Diab., Res. Clin. Pract.* 97, 105-111. Doi 10.1016/j.diabres.2012.02.011 (IF: 2.754).
48. Tiwari V, Parmar HS. Diabetogenic effects of *Parthinium hysterophorus* induced allergic rhinitis. *Inflamm Allergy Drug Targets*. 2012;11:492-8 (IF: 3.97).
49. Tiwari, R. and Kumar, A. (2012) Starch phosphorylase: Biochemical and Biotechnological perspectives. *Biotechnol. Mol. Biol. Rev.* 7, 69-83.
50. Barh, D., Gupta, K.K., Jain, N., Khatri, G., Sicairos, N.L., Canizalez-Roman, A., Tiwari, S., Verma, A., Rahangdale, S., Hassan, S.S., dos-Santos, A.R., Ali, A., Guimaraes, L.C., Ramos, R.T.J., Devarapalli, P., Barve, N., Bakhtiar, M., Kumavath, R., Ghosh, P., Miyoshi, A., Silva, A., Kumar, A., Misra, A.N., Blum, K., and Azevedo, V. (2012) Globally conserved inter-species bacterial PPIs based conserved host-pathogen interactome in *C. pseudotuberculosis*, *C. diphtheria*, *M. tuberculosis*, and *Y. pestis*: implementation in broad spectrum drug target identification. *Integrative Biol.* In press. Doi: 10.1039/c2ib20206a.
51. Barve, N., Mandloi, P., Kumar, A. and Jain, A. (2012) 2D QSAR analysis of inositol derivatives as inositol monophosphatase inhibitors. *Adv. Res. Pharmaceut. Biol.* 2, 79-87.
52. Hassan, S., Schneider, M.P., Ramos, R.T., Carneiro, A., Lima, A.R., Guimarães, L.C., Ali, A., Bakhtiar, S., Pereira, U., Santos, A., Soares, S.C., Dorella, F., Pinto, A., Ribeiro, D., Barbosa, M.S., Almeida, S., Abreu, V.A., Aburjaile, F., Fiaux, K.K., Barbosa, E.G., Diniz, C., Rocha, F., Saxena, R., Tiwari, S., Zambare, V., Ghosh, P., Pacheco, L.G., Dowson, C., Kumar, A., Barh, D., Miyoshi, A., Azevedo, V. and Silva, A. (2012) Whole genome sequence of *Corynebacterium pseudotuberculosis* strain 162 isolated from camel. *J. Bacteriol.* 194, 5718-5719.

53. Juneja L, Parmar HS. Ovalbumin induced allergic rhinitis and development of prediabetes to rats: possible role of th2 cytokines. *Inflamm Allergy Drug Targets*. 2013 4; 12(3):199-205 (IF: 3.97).
54. Dhote, M., Juwarkar, A., and Kumar, A. (2013) Bioremediation of oil sludge- Present and Future. *International J. Sustainable Biotechnol.* In press
55. Barh, D., Barve, N., Gupta, K.K., Chandra, S., Jain, N., Tiwari, S., Sicairos, N, L., Canizalez-Roman, A., dos-Santos, A.R., Almeida, S., Ramos, R.T.J., de- Abreu, A.C., Carneiro, A.R., Soares, S.C., Castro, T.L.P., Miyoshi, A., Silva, A., Kumar, A., Misra, A.N., Blum, K., Braverman, E.R. and Azevedo, V. (2013) Exoproteome and secretome derived broad spectrum novel drug and vaccine candidates in *Vibrio cholera* targeted by Piper betel derived compounds. *PLOS One* in press.
56. Sharma, M., Mehta, S. and Kumar, A. (2013) Purification and characterization of alkaline xylanase secreted from *Paenibacillus macquariensis*. *Adv. Microbiol.* 3, 32-41.
57. Sharma, M. and Kumar, A. (2013) Xylanase: An Overview. *British Biotechnol. J.* 3, 1-28.
58. Barh D, Jain N, Tiwari S, Field JK, Padín E, Ruibal E, López R, Bhattacharya A, Juneja L, Viero C, Silva A, Miyoshi A, Kumar A, Blum K, Herranz M, Azevedo V, Liloglou T [2013], A novel in silico reverse-transcriptomics-based identification and blood-based validation of a panel of sub-type specific biomarkers in lung cancer'. *BMC Genomics* (Accepted) [Impact Factor: 4.40].

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. 3,00,000/-.
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.

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 (June18, 2013 to July08, 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.
- He is working for popularization of Biotechnology. He has organized various conferences and workshops. He has organized National Science Weeks in 1992, 1993, 1994, 1997, 2000, 2002, 2003, 2004. He has also organized Technician Training Programme of 3 months. He has also organized Popular Lecture Series in 1993 and in Aug. 1998 and Bioinformatics Workshops regularly since 1997.
- 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 Associate ship 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 is Associate Editor for the Journal of Cell & Tissue Research. Besides, he is member of the Editorial Board of many journals Viz. Journal of Proteomics & Bioinformatics, Journal of Computer Science & Systems Biology, Current Trends in Biotechnology and Pharmacy, Biotechnology & Molecular Biology Reviews etc.
- 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.

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

Year	National	International
2007-08	Workshop on Bioinformatics for genomics and proteomics data analysis (Oct 29-Nov 02, 2007)	
2008-09	Workshop on machine learning techniques for bioinformatics data analysis (04-08, Nov, 2008)	5 th world congress of Cellular and Molecular Biology (02-06, Nov, 2009)
2009-10	Workshop on structural Bioinformatics and system biology (25-27, Nov, 2009)	
2010-11	Workshop on computational Biology and Molecular Dynamics (20-22, Jan, 2011)	
2011-12	National Seminar on Industrial facet of Biotechnology (24-25 Jan, 2012)	
2012-13	World Ocean Day (8 th June 2013)	

2013-2014	Bioinformatics Workshop on Genomics, Proteomics and Bioinformatics (Aug 29 to Aug31, 2013).	
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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

Name of the Course (refer to question no. 4)	Applications received	Selected Male Female	Pass percentage in qualifying UG examinations Male Female
JET (Joint entrance Test) for M.Sc.	On an average 8000-10000 students	Biotech: 7M 19F	55%

Biotech (industry), Genetic Engineering and Bioinformatics and CEEB (conducted through JNU, New Delhi)	appear in CEEB and 100-300 for JET	G.E. 9M 10F Bioinfo. 9M 8F	
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33. Diversity of students

Name of the Programme (refer to question no. 4)	% of students from same University	% of students from other Universities within the State	% of students from other Universities outside the State	% of students from other Countries
M.Sc. Biotechnology	42.30		57.70	
M.Sc. Genetic Engineering	94.73		5.27	
M.Sc. Bioinformatics	88.23		5.89	

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)

Name of examination	% of students appeared	% of students qualified
CSIR-UGC-NET	95 (ELIGIBLE STUDENTS)	30
GATE	95 (ELIGIBLE STUDENTS)	70

TIFR/NCBS/IGIB/AIIMS/DBT- JRF/ IISc/ IITs/ IARI/DSR/ICAR/IISER	75(ELIGIBLE STUDENTS)	~57
GRE/TOEFL	10	10

35. Student progression

Student progression	Percentage against enrolled
UG to PG	NA
PG to M.Phil.	NIL
PG to Ph.D.	68.8
Ph.D. to Post-Doctoral	20
Employed	
• Campus selection	
• Other than campus recruitment	~30
Entrepreneurs	~1-2

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 Chaurasia

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).
2. Dr. Nevil J Singh, Scientist TIFR, Mumbai (1993).
3. Dr. B. Venkaiah, Faculty USA (1995).
4. Mr. Somnath Ghosh: Scientist BARC, Mumbai (2003).
5. Mr. Arjun Singh Raghuwanshi, Scientist INTAS, Ahmedabad (2003).
6. Dr. Sumati Mattoo, USA(2004).
7. Dr. Divya Sinha, Iowa State University, USA (2005).
8. Dr. Arun Singh, Munich Germany (2006).
9. Dr. Sarika Garg, Postdoc, Canada (2007).
10. Dr. Himanshu Arora, Korea (2007).
11. Mr. Rustam Ali, IISc. Bangalore (2008).

12. Mr. Amit Tripathi, ICGEB, New Delhi (2010).
 13. Ms. Vinita Tiwari, IISc. Bangalore (2011).
14. Give details of student enrichment programmes (special lectures / workshops / seminar) involving external experts.
 1. Workshop on Bioinformatics: Computational Biology and Molecular Dynamics (2011).
 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).
 4. Lecture on Photosynthesis delivered by Prof. Govindjee, Emeritus, Albana University, USA (2012) on 19th Oct. 2012.
 5. Lectures from Gynecologists and Obstetrics for Girl students (17.01.2013).
 6. National workshop on Bioinformatics to be held on 29-31 Aug, 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.
 22. f. Mechanism of DNA histone binding: epigenetic regulation.
 23. g. To improve communication and research skills, presentations delivered by students on research topics.
 24. Web references:
 25. <http://www.ncbi.nlm.nih.gov/books/NBK27044/>
 26. www.pubmed.com
 27. <http://scholar.google.co.in/>
 28. <http://highered.mcgraw->

hill.com/sites/0072495855/student_view0/chapter2/animation_mitosis_and_cytokinesis.html

29. http://www.phschool.com/science/biology_place/biocoach/cellresp/review5a.html

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.

Evaluate SSR Report of School of Biotechnology

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.

1. Our department produced 25 Ph.D. and 370 M.Sc. students.
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

Prof. Suresh Kumar
with seal:
School of Biotechnology,
Keshavnagar, Vishwavidyalaya, INDORE

Place: **Indore**
Date: **23.08.2013**