

CURRICULUM VITAE

NAME: Dr. Pravindra Kumar, Associate Professor
Department of Biotechnology
Indian Institute of Technology Roorkee, Roorkee – 247 667

Date of birth: March 01, 1973

Educational Qualifications:

Ph. D (Biophysics): All India Institute of Medical Sciences, New Delhi 2001

Title: "Three Dimensional Structure Determination of Lactoferrin." **Gold Medal for Best Ph.D.** .

TEACHING & RESEARCH EXPERIENCE: 18 Years

1. Worked as a Senior Demonstrator at A.I.I.M.S., Delhi (1996 – 1999)
2. Worked as a Post-Doc at Purdue University, USA (2001-2005)
3. Worked as Assistant Professor at I.I.T. Roorkee (2005-2012)
4. Worked as Associate Professor at I.I.T. Roorkee since 2012-cont.

Courses Taught: X-ray Crystallography, Bioinformatics, Biochemistry & Biophysics and Macromolecular Crystallography (Institute Elective)

SPONSORED PROJECTS as P.I.

Title	Sponsoring Agency	Tenure	Funding (Rs. Lakhs)
<u>As Principal Investigator:</u>			
1. Structural Studies of Aromatic-ring-Hydroxylating Dioxygenases and their complexes with toxic Polyaromatic compounds	DST, New Delhi	03 Years (2006-2009)	11.16
2. Structural characterization of the enzymes involved in the biodegradation of polychlorinated biphenyls and other Waste materials	MHRD-IITR	01 Years (2006)	1.0
3. Structural studies of biphenyl dehydrogenase from <i>Comamonas testosteroni</i> strain B-356	C.S.I.R., New Delhi	03 Years (2008-2011)	10.7

4. Structural Characterization Of DAHP Synthase For Designing Rational Inhibitors As Antibacterial Drug.	MHRD-IITR	03 Years (2008-2011)	9.6
5. Structural analysis of DAHP synthase from <i>Arabidopsis thaliana</i>	DST, New Delhi	03 Years (2010-2013)	29.95
6. Microbial degradation of toxic aromatic compounds using structural biology approach.	DRDO	03 Years (2012-2015)	41.27
7. Structure-based development of anti-bacterial enzyme inhibitors against enzyme involved in lipooligosaccharide (LOS) biosynthesis: <i>Structure determination and in-silico</i> drug design against <i>Moraxella catarrhalis</i> UDP-N-acetylglucosamine acyltransferase (LpxA)	ICMR	03 Years (2012-2015)	38.0
8. Structural studies of chorismate synthase	CSIR	03 Years (2013-16)	23.0
9. Structural studies of 11S globulin	DBT	03 Years (2013-16)	26.0

Awards and Recognition's:

1. **S.V. TALEKAR MEDAL FOR BEST POST GRADUA0074**

E DEGREE IN AIIMS, DELHI

2. **Awarded Senior Research Fellowship**, Council of Scientific and Industrial Research (1999-2001), Govt. of India.

3. **Visiting Scientist** (2006) at PURDUE UNIVERSITY, USA

4. **BOYSCAST award** (2008) from Department of Science and Technology, India and **Visiting Scientist** at Purdue University, USA

5. **Visiting Scientist (2011)** at BM-14, ESRF-Grenoble

DUTIES & RESPONSIBILITIES AT IIT ROORKEE:

Since my joining, I have developed a Macromolecular Crystallographic Unit (MCU) in IIC. It consists of Molecular cloning, Protein biochemistry, Isothermal Calorimeter and X-ray crystallography sections. This facility is being heavily used by IITR students/faculty. I have also developed a bioinformatics lab in the Dept. of Biotechnology and I am the O/C of these two labs.

I have also provided my contribution towards institute administration as a warden from 2006-2008, staff adviser of volleyball & badminton from 2007-2011 and Deputy Chief Adviser of student club (2010-contd.).

RESEARCH GUIDANCE:	Awarded	Submitted:	In progress
Ph. D	05	0	9
M. Sc.	11	Nil	2
B.Tech	14	Nil	3
RAs			1

Complete list of publications in SCI Journals & other Referred Journals in **chronologically descending order beginning with publications in 2012 along with impact factor of the journal.**

(Paper published after filling the form)

1. Selvakumar P, Sharma N, Tomar PP, **Kumar P**, Sharma AK. (2013) Structural insights into the aggregation behavior of *Murraya koenigii* miraculin-like protein below pH 7.5.

Proteins. In Press.

2. Dev, A., Bodra, N. Kumar, P., Pratap, S, **Kumar, P.** (2013) Homology modeling and functional characterization of three-dimensional structure of DAHP Synthase from *Brachypodium distachyon*. *J. Proteins Proteom.* 4(1). **In Press.**

3. Patil DN, Datta M, Dev A, Dhindwal S, Singh N, Dasauni P, Kundu S, Sharma AK, Tomar S, **Kumar P.** (2013) Structural Investigation of a Novel N-Acetyl Glucosamine Binding Chi-Lectin Which Reveals Evolutionary Relationship with Class III Chitinases. *PLoS One.* 23;8(5):e63779. [Epub ahead of print]

4. Mukhi N, Dhindwal S, Uppal S, **Kumar P**, Kaur J, Kundu S. (2013) X-Ray crystallographic structural characteristics of Arabidopsis hemoglobin I and their functional implications. *Biochim Biophys Acta.* [Epub ahead of print]

5. Preeti, Tapas S, **Kumar P**, Madhubala R, Tomar S. (2013) Structural insight into DFMO resistant ornithine decarboxylase from *Entamoeba histolytica*: an inkling to adaptive evolution. *PLoS One*. (In Press)
6. Colbert CL, Agar NY, **Kumar P**, Chakko MN, Sinha SC, Powlowski JB, Eltis LD, Bolin JT. (2013) Structural characterization of *Pandoraea pnomenusa* B-356 biphenyl dioxygenase reveals features of potent polychlorinated biphenyl-degrading enzymes. *PLoS One*. (In Press)
7. Aggarwal M, Tapas S, Preeti, Siwach A, **Kumar P**, Kuhn RJ, Tomar S. (2013) Crystal structure of aura virus capsid protease and its complex with dioxane: new insights into capsid-glycoprotein molecular contacts. *PLoS One*. (In Press)
8. Patil, D.N., Chaudhry, A., Sharma, A.K., Tomar, S., **Kumar, P.** (2012). Structural basis for dual inhibitory role of tamarind Kunitz inhibitor (TKI) against factor Xa and trypsin **279(24):4547-64. FEBS J (Impact factor 3.97)**
9. Kumar, P., Patil, D.N., Chaudhary, A., Tomar, S., Yernool, D., Singh, N., Dasauni, P., Kundu, S., & **Kumar, P.**, (2012) Purification and biophysical characterization of IIS globulin from *Wrightia tinctoria* exhibiting hemagglutinating activity. *Protein & peptide letters* **20(5):499-509 (Impact factor 1.94)**
10. **Kumar P**, Mohammadi M, Dhindwal S., Bolin JT & Sylvestre M. (2012) Structural insights into the metabolism of 2-chlorodibenzofuran by an evolved biphenyl dioxygenase *BBRC*. **421(4):757-62. (Impact factor 2.72)**
11. Pratap S, Narwal M, Dev A, Dhindwal S, Tomar S, **Kumar P** (2012) Crimean- Congo hemorrhagic fever virus: Strategies to combat with an emerging threat to human *Current Bioinformatics*. **7 (4), 466-477. (Impact factor 2.1)**
12. **Kumar, P.**, Mohammadi, M., Viger, J.F., Barriault, D., Gomez-Gil, L., Eltis, LD., Bolin J.T. & Sylvestre M. (2011). Structural Insight into the Expanded PCB-Degrading Abilities of a Biphenyl Dioxygenase Obtained by Directed Evolution. *J Mol Biol*. 405(2):531-47.
13. Dev, A., Tapas,S., Pratap,S., **Kumar, P.** (2012) Structure and Function of Enzymes of Shikimate Pathway *Current Bioinformatics* **7 (4), 374-391 (Impact factor 2.1)**
14. Preeti, Tapas S, **Kumar P**, Madhubala R, Tomar S. (2012) Biochemical, Mutational and In Silico Structural Evidence for a Functional Dimeric Form of the Ornithine Decarboxylase

from *Entamoeba histolytica*. *PLoS Negl Trop Dis*. PMID: 22389745; PubMed Central PMCID: PMC3289617. **(In Press) (Impact factor 4.42)**

15. Narayanan A, Paul LN, Tomar S, Patil DN, **Kumar P**, Yernool DA. (2012) Structure-function studies of DNA binding domain of response regulator KdpE reveals equal affinity interactions at DNA half-sites. *PLoS One*. PMID: 22291906; PubMed Central PMCID: PMC3264566. **(In Press) (Impact factor 4.41)**

16. Aggarwal, M., Dhindwal, S., Pratap, S., Kuhn, R.J., **Kumar P.**, & Tomar, S. (2011). Crystallization, high-resolution data collection and preliminary crystallographic analysis of Aura virus capsid protease and its complex with dioxane. *Acta Cryst*. F67, 1394-1398 **(Impact factor 0.65)**

17. Bhattacharya, S., & **Kumar, P.** (2011). An insilico approach to structural elucidation of 3-deoxy-d arabino-heptulosonate 7-phosphate synthase from *Arabidopsis thaliana*: Hints for herbicide design. *Phytochemistry*. 2011 Oct 12. [Epub ahead of print] PubMed PMID: 22000723. **(Impact factor 3.34)**

18. Dhindwal, S., Patil, D.N., Mohammadi, M., Sylvestre, M., Tomar, S., **Kumar, P.** (2011). Biochemical studies and ligand bound structures of biphenyl dehydrogenase from *Pandoraea pnomenua* strain B-356 reveal a basis for broad specificity of the enzyme. *J Biol Chem*. 286(42):37011-22. **(Impact factor 6.91)**

19. Tapas, S., Kumar, A., Dhindwal, S., Preeti, **Kumar, P.** (2011). Structural analysis of chorismate synthase from *Plasmodium falciparum*: A novel target for antimalaria drug discovery. *Int J Biol Macromol*. 49(4), 767-77. **(Impact factor 2.61)**

20. Mohammadi, M.[†], Viger, J.F.[†], **Kumar, P.**[†], Barriault, D., Bolin, J.T., & Sylvestre, M. (2011). Fine tuning Rieske - type oxygenases reactive atoms to expand their substrate range. *J. Biol. Chem.* ([†]*Contributed equally*). 286(31):27612-21. **(Impact factor 6.91)**

21. **Kumar, P.**, Mohammadi, M., Viger, J.F., Barriault, D., Gomez-Gil, L., Eltis, L.D., Bolin J.T. & Sylvestre M. (2011). Structural Insight into the Expanded PCB-Degrading Abilities of a Biphenyl Dioxygenase Obtained by Directed Evolution. *J Mol Biol*. 405(2):531-47. *Arch Biochem Biophys*. **(Impact factor 4.09)**

22. **Kumar, P.**, Gómez-Gil, L., Mohammadi, M., Sylvestre, M., Eltis, L.D. & Bolin, J.T. (2011). Anaerobic crystallization and initial X-ray diffraction data of biphenyl 2,3-

dioxygenase from Burkholderia xenovorans LB400: addition of agarose improved the quality of the crystals. *Acta Crystallogr Sect F*, 67, 59-62. **(Impact factor 0.65)**

23. Sakshi, Patil, D.N., Tomar, S., Sylvestre, M., & **Kumar, P.** (2010). Expression, purification, crystallization and preliminary crystallographic studies of cis-biphenyl-2,3-dihydrodiol-2,3-dehydrogenase from Pandoraea pnomenus B-356. *Acta Crystallogr Sect F*, 66:1517-20. **(Impact factor 0.65)**

24. Gahloth, D., Selvakumar, P., Shee, C., **Kumar, P.**, Sharma, A.K. (2010). Cloning, sequence analysis and crystal structure determination of a miraculin-like protein from *Murraya koenigii*. *Arch Biochem Biophys*. 1;494(1):15-22. **(Impact factor 3.02)**

25. Tomar, S., Patil, D.N., Datta, M., Tapas, S., Preeti, Chaudhary, A., Sharma, A.K., Tomar, S., **Kumar, P.** (2009). Crystallization and preliminary X-ray diffraction analysis of the complex of Kunitz-type tamarind trypsin inhibitor and porcine pancreatic trypsin. *Acta Crystallogr Sect F Struct Biol Cryst Commun*. 1;65(Pt 11):1179-81. **(Impact factor 0.65)**

26. Patil, D.N., Datta, M., Chaudhary, A., Tomar, S., Sharma, A.K. & **Kumar, P.** (2009). Isolation, purification, crystallization and preliminary crystallographic studies of chitinase from tamarind (*Tamarindus indica*) seeds. *Acta Crystallogr Sect F Struct Biol Cryst Commun*. 65(Pt 4):343-5. **(Impact factor 0.65)**

27. Patil, D.N., Preeti, Chaudhry, A., Sharma, A.K., Tomar, S., **Kumar, P.** (2009). Purification, crystallization and preliminary crystallographic studies of a Kunitz-type proteinase inhibitor from tamarind (*Tamarindus indica*) seeds. *Acta Crystallogr Sect F Struct Biol Cryst Commun*. 65(Pt 7):736-8. **(Impact factor 0.65)**

28. Nath, M., **Kumar, P.**, & Sulaxna. (2009). Structural Investigation of (5-Amino-1,3,4-thiadiazolyl-2-thionato)trimethyltin(IV): 1D Chains Generated by Hydrogen Bonding. *SPECTROSCOPY LETTERS*, 42, 268-273. **(Impact factor 0.74)**

29. Nath, M., Singh, H., **Kumar, P.**, Kumar, A., Song, X. and Eng, G. (2009), Organotin(IV) tryptophanylglycinates: potential non-steroidal antiinflammatory agents; crystal structure of dibutyltin(IV) tryptophanylglycinate. *Applied Organometallic Chemistry*, 23: 347–358. **(Impact factor 2.06)**

30. Chaudhary, N.S., Shee, C., Islam, A., Ahmad, F., Yernool, D., **Kumar, P.** & Sharma, A.K. (2008). Purification and characterization of a trypsin inhibitor from *Putranjiva roxburghii* seeds. *Phytochemistry*. 69(11):2120-6. **(Impact factor 0.65)**

31. Shee, C., Singh, T.P., **Kumar, P.** & Sharma, A.K. (2007). Crystallization and preliminary X-ray diffraction studies of *Murraya koenigii* trypsin inhibitor. *Acta Crystallogr Sect F Struct Biol Cryst Commun.* 63(Pt 4):318-9. **(Impact factor 0.65)**
32. Horsman, G.P., Bhowmik, S., Seah, S.Y., **Kumar, P.**, Bolin, J.T. & Eltis, L.D. (2007). The tautomeric half-reaction of BphD, a C-C bond hydrolase. Kinetic and structural evidence supporting a key role for histidine 265 of the catalytic triad. *J Biol Chem.* 282(27):19894-904. **(Impact factor 6.91)**
33. Gomez-Gil L., **Kumar, P.**, Barriault, D., Bolin, J.T., Sylvestre, M. & Eltis, L.D. (2007). Characterization of biphenyl dioxygenase of *Pandoraea pnomemusa* B-356 as a potent polychlorinated biphenyl-degrading enzyme. *J Bacteriol.* 189(15):5705-15. **(Impact factor 3.73)**
34. Dey, S., Vijayaraghavan, R., Goel, V.K., Kumar, S., **Kumar, P.** & Singh, T.P. (2004) Design of a model peptide with α , β -dehydro-residues: Synthesis of Boc-Ile- Δ Ala-OCH₃ and its crystal structures obtained from two different solvents. *J. Mol. Struct.* 737 27-3. **(Impact factor 1.60)**
35. Vijayaraghavan, R., Makker, J., **Kumar, P.**, Dey, S., Singh, T. P. (2003) Crystal structure of Boc-Trp (CHO) - Δ Phe-Ile- Δ Phe-Leu-OCH₃, C48H59N6O10. *Zeitschrift fuer Kristallographie - New Crystal Structures*, 218(1), 52-54. **(Impact factor 1.16)**
36. Makker, J., Dey, S., **Kumar, P.**, Singh, T. P. (2003) Crystal structure of Boc-Ile- Δ Phe-Ile-OCH₃, C27H43N3O7. *Zeitschrift fuer Kristallographie - New Crystal Structures* (2003), 218, 179-180. **(Impact factor 1.16)**
37. Vijayaraghavan R., Makker, J., **Kumar, P.**, Dey S., Singh T.P. (2003). Design of peptides with α , β -dehydro-residues: syntheses, crystal structures and molecular conformations of two Δ Phe-Trp containing peptides: *Journal of Molecular Structure*, 654(1-3), 103-110. **(Impact factor 1.60)**
38. Makker, J., Dey, S., Mukherjee, S., Vijayaraghavan, R., **Kumar, P.**, Singh, T. P. (2003). Design of peptides with α , β -dehydro-residues: synthesis, crystal structure and molecular conformation of a tetrapeptide Z- Δ Val-Val- Δ Phe-Ile-Ome. *Journal of Molecular Structure*, 654(1-3), 119-124. **(Impact factor 1.60)**
39. Vijayaraghavan R., **Kumar P.**, Dey S., Singh T.P. (2003). Design of peptides with branched beta-carbon dehydro-residues: syntheses, crystal structures and molecular

conformations of two peptides, (I) N-Carbobenzoxy-DeltaVal-Ala-Leu-OCH₃ and (II) N-Carbobenzoxy-DeltaIle-Ala-Leu-OCH₃ : *J. Pept. Res.* 62(2):63-9. (**Impact factor 1.95**)

40. Mohanty A.K., Singh G., Paramasivam M., Saravanan K., Jabeen T., Sharma S., Yadav S., Kaur P., **Kumar P.**, Srinivasan A., Singh T.P. (2003). Crystal structure of a novel regulatory 40-kDa mammary gland protein (MGP-40) secreted during involution : *J. Biol. Chem.* 278(16):14451-60. (**Impact factor 6.91**)

41. Makker, J., Dey, S., Mukherjee, S., **Kumar, P.**, Singh, T. P. (2002). Crystal structure of Boc-Leu-ΔPhe-ΔPhe-Ile-OCH₃, C₃₆H₄₈N₄O₇. *Zeitschrift fuer Kristallographie-New Crystal Structures* (2002), 217(3), 372-374. (**Impact factor 1.16**)

42. Makkar, J., Dey, S., **Kumar, P.**, Singh, T.P. (2002). Crystal structure of Boc-Leu-ΔPhe-Ile-ΔPhe-Ile-OCH₃, C₄₂H₅₉N₅O₈. *Zeitschrift fuer Kristallographie - New Crystal Structures*, 217(3), 369-371. (**Impact factor 1.16**)

43. **Kumar, P.**, Yadav, S. & Singh, T.P. (2002). Crystallization and structure determination of goat lactoferrin at 4.0 Å resolution: A new form of packing in lactoferrins with a high solvent in crystals. *Ind. J. Biochem. Biophys.* 39(1):16-21. (**Impact factor 0.82**)

44. Makkar, J., Dey, S., **Kumar, P.**, Singh, T.P. (2002). Design of peptides with alpha, beta-dehydro residues: pseudo-tripeptideN-benzyloxycarbonyl-DeltaLeu-L-Ala-L-Leu-OCH₃. *Acta Crystallogr C* 58, 212-4. (**Impact factor 0.75**)

45. **Kumar, P.**, Khan, J.A., Yadav, S. & Singh, T.P. (2002). Crystal structure of equine apolactoferrin at 303 K providing further evidence of closed conformations of N and C lobes. *Acta Crystallogr D* 58, 225-32. (**Impact factor 14.0**)

46. Singh, J.D., Milton, M.D., Bhalla, G. Khandelwal, B. L., **Kumar, P.**, Singh, T. P., Butcher, R. J. (2001). Design, synthesis and structural aspects of acyclic N₃E₂ (E = Se or Te) type donors and its complexes with Group 12 metals. *Phosphorus, Sulfur and Silicon and the Related Elements.* (171-172) 477-484. (**Impact factor 0.72**)

47. Milton, M.D., Singh, J. D., Khandelwal, B. L.; **Kumar, P.**, Singh, T. P., Butcher, R. J. (2001). Design, synthesis and structural aspects of terdentate (N,O,Se/Te) donors and their competitive coordination behavior towards Pt(II). *Phosphorus, Sulfur and Silicon and the Related Elements*, (171-172) 485-492. (**Impact factor 0.72**)

48. Tomar, S., Yadav, S., Chandra, V., **Kumar, P.**, Singh, T.P. (2001). Purification, crystallization and preliminary X-ray diffraction studies of disintegrin (schistatin) from saw-scaled viper (*Echis carinatus*): *Acta Crystallogr* D57, 1669-70. **(Impact factor 14.0)**
49. Vijayaraghavan, R., **Kumar, P.**, Dey, S., Singh, T.P. (2001). Design of peptides with alpha, beta-dehydro residues: a dipeptide with a branched beta-carbon dehydro residue at the (i+1) position, methyl N - (benzyloxycarbonyl) - alpha, beta - didehydrovalyl - L - tryptophanate: *Acta Crystallogr* C57, 1220-1. **(Impact factor 0.75)**
50. Khan, J.A., **Kumar, P.**, Sharma, S., Mohanty, A.K., Jabeen, T., Paramasivam, M., Yadav, S., Srinivasan, A. & Singh, T.P. (2001). Mechanism of iron-uptake and iron-release in lactoferrins: *Proc. Ind. Nat. Sc. Acad. (INSA)* B67, 1-17.
51. **Kumar, P.**, Yadav, S., Srinivasan, A., Bhatia, K.L. & Singh, T.P. (2001). A novel 40 kDa protein from goat mammary secretions: purification, crystallization and preliminary X-ray diffraction studies: *Acta Crystallogr.* D57, 1332-3. **(Impact factor 14.0)**
52. Sharma, S., **Kumar, P.**, Betzel, C., Singh, T.P. (2001). Structure and function of proteins involved in milk allergies: *J Chromatogr B Biomed Sci Appl.* 756(1-2), 183-7. **(Impact factor 3.0)**
53. Khan, J.A., **Kumar, P.**, Paramasivam, M., Yadav, R.S., Sahni, M.S., Sharma, S., Srinivasan, A. & Singh, T.P. (2001). Structure of camel apolactoferrin at 2.6Å resolution and structural basis of its dual role as a transferrin-cum-lactoferrin: *J. Mol. Biol.* 309(3), 751-61. **(Impact factor 4.09)**
54. Khan J.A., **Kumar, P.**, Srinivasan, A., Singh, T.P. (2001). Protein intermediate trapped by the simultaneous crystallization process. Crystal structure of an iron-saturated intermediate in the Fe³⁺ binding pathway of camel lactoferrin at 2.7 Å resolution: *J.Biol. Chem.* 276(39), 36817-23. **(Impact factor 6.91)**
55. Betzel, C., Gourinath, S., **Kumar, P.**, Kaur, P., Perbandt, M., Eschenburg, S. & Singh, T.P. (2001). Structure of a serine protease proteinase K from *Tritirachium album* Limber at 0.98Å resolution: *Biochemistry.* 40(10), 3080-8. **(Impact factor 3.23)**
56. Bhatia, S., **Kumar, P.**, Kaur, P., & Singh, T.P. (1999). Design of peptides with α, β -dehydro-residues: synthesis, and crystal and molecular structure of a 310-helical tetrapeptide Boc-L-Val- Δ P η ϵ - Δ Phe-L-Ile-OCH₃: *J. Pept. Res.* 54, 249-256. **(Impact factor 1.95)**

57. Vijayaraghavan, R., **Kumar, P.**, Dey, S. & Singh, T.P. (1998). Design of Peptides with α, β -Dehydro-residues: Synthesis, Crystal and Molecular Conformation of N-Boc-L-Ile- Δ Phe-L-Trp-OCH₃: *J.Pept Res.* 52, 89-96. (**Impact factor 1.95**)