

CURRICULUM VITAE

KRISHNA PRAKASH, Ph.D.

Department of Biotechnology

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CAREER OBJECTIVES

The rapid advancement of research, in various fields of Biochemistry and Biotechnology such as Molecular Biology, Functional genomics, Proteomics, Bioinformatics, Structural Biology etc., meant to influence the all spheres of human life such as medicine, agriculture, food technology and environment. For the improvement of human life, this branch of Life Sciences is demanding new approaches to research and creating new challenges. I am committed to meet these challenges and contribute new solutions, to serve mankind.

CURRENT STATUS

Presently, I am working as an Assistant Professor (Contract) at Department of Biotechnology in Central University of Bihar, Patna from July 2010 to till today. My job is to teach M.Sc biotechnology students and carry out practical experiments for them. Apart that I am establishing research laboratory and writing a project to generate fund to initiate PhD programme.

ABSTRACT OF Ph.D. THESIS

Functional analysis of recombinant murine IRF-2

Interferon Regulatory Factor-2 (IRF-2) has generally been described as a transcriptional repressor, and is functioning by competing with the transcriptional activator IRF-1. However, IRF-2 can also act as a positive regulator for interferon-stimulated response element (ISRE)-like sequences such as the promoters: histone H4, Vascular cell adhesion molecule-1 (VCAM-1), IL-7 and TLR-9. IRF-2 plays important role in cell growth regulation, and has been shown to act as a potential oncogene. Despite extensive information regarding involvement of IRF-2 in diverse cellular processes, very little is known about the mechanism(s) by which its structural domains function. IRF-2 is a typical modular protein comprising of many individual domains. Distinct domains have been identified such as DNA binding domain, transcriptional activation domain (TAD), IRF association domain-2 (IAD2) and transcription repression domain (RD). Its C-terminal domain facilitates the diversity in function of IRF-2. Its repression/activation potential is modulated by posttranslational modification and interaction with other factors. The specificity of interacting partners varies with the cell type and specific stimuli to evoke an

appropriate response. The present study aimed at: (a) generating prokaryotic expression plasmid for IRF-2; (b) expression of recombinant IRF-2 as GST-IRF-2 in *E. coli*; (c) study of the DNA binding activity of the recombinant IRF-2; (d) generation of recombinant mutant IRF-2 i.e. replacing of mouse IRF-2 314 to 317 region by the corresponding human a.a. sequence and (e) determining DNA binding activity of the two IRF-2 molecules. The DNA binding activities of the recombinant wild type IRF-2 with ³¹⁴PAPV³¹⁷ and the mutant IRF-2 with ³¹⁴SSSM³¹⁷ by using (GAAAGT)₄ DNA sequence were different. Thus, 314-PAPV-317 and 314-SSSM-317 sequence may regulate/influence IRF-2 DNA binding activity. Therefore, such comparative study may help in better understanding of the molecular evolution of transcription factors.

EDUCATIONAL QUALIFICATION

Qualification	Univ./Board	Percentage	Div	Year	Subjects
Ph.D.	JNU, New Delhi			2008	Title “Functional analysis of recombinant murine IRF-2”
M.Phil	JNU, New Delhi 110067	62	1 st	2003	Title “Expression of Recombinant IRF-2”.
M.Sc. (Biotechnology)	Lalit Narayan Mithila University Darbhanga-846008 INDIA	73.3	1 st	2000	Molecular Biology*, Immunology*, Cell Biology, Microbiology, Biotechnology, Basic principles of genetic engineering*, Biochemistry, Computer & Biostat.
B.Sc. Botany (Hons.)	BR Ambedkar Bihar University, Muzaffarpur, Bihar, India	67.8	1 st	1996	Botany (Hons), Zoology, Chemistry etc.

* Obtained distinction marks.

MEMBERSHIP OF SCIENTIFIC SOCIETIES

- ❖ Advisory Editorial board member of Journal of Biosciences and Medicine (JBM, ISSN: 2161-2625).
- ❖ Reviewer of Pharmaceutical biology journal (ISSN: 1388-0209 (print), 1744-5116 (electronic))

RESEARCH EXPERIENCE

- ❖ I worked as a Research Associate (I) from January 2010 to June 2010 in the project entitled “***E. coli*–Expressed Recombinant Porcine Zona Proteins as Candidate Antigens for immunocontraception in Wild Life**” funded by Humane society of the United states under Indo-US project at National Institute of Immunology, New Delhi. From this work one manuscript has been communicated in international journal of repute.
- ❖ I worked as a Research Associate (III) from March 2008 to November 2009 in the project entitled “**Isolation and characterization of nucleic acid unwinding enzyme from malaria**”

parasite *plasmodium falciparum*” funded by Department of Science and Technology (DST) at International Center for Genetic Engineering and Biotechnology, New Delhi. The work included cloning, expression, and Site directed mutagenesis, purification of recombinant protein, followed by functional analysis. From this work one Malaria helicase (PFF1500c) cloned gene sequence has been submitted to the GeneBank and the accession number is **FJ641053**.

- ❖ Attended and oral presented title “**Comparison of DNA binding activity of the recombinant wild and mutant IRF-2 on P³² (GAAAGT)₄ oligo by EMSA**” in Biospark 2008 14th to 15th march 2008.
- ❖ Attended and presented poster title “**Modulation of DNA-binding activity of Interferon Regulatory Factor (IRF)-1 and IRF-2**” presented in Society of Biological chemists (India), 75th annual meeting December 8-11, 2006.
- ❖ Attended and presented poster title “**Expression and DNA binding activity of IRF-2**” presented in Biospark 2005 24th to 25th February 2005.
- ❖ Summer internship carried out at Department of **Biotechnology, NIPER, Mohali Chandigarh, Punjab in 1999**, during my M.Sc.

SCHOLARSHIP AWARDED

- ❖ Qualified all India Entrance test for the award of **Junior Research Fellowship** in July –2001 conducted Jointly by **Council for scientific and Industrial Research (CSIR) and University Grant Commission (UGC)**, New Delhi, India. The Fellowship is awarded for five years.

ACADEMIC ACHIEVEMENT

- ❖ Cleared **Graduate Aptitude Test in Engineering (GATE) 2001** conducted by **Indian Institute of Technology (IIT) Kanpur**, India.
- ❖ Cleared **Graduate Aptitude Test in Engineering (GATE) 2003** percentile conducted by **Indian Institute of Technology (IIT) Madras**, India.
- ❖ Cleared all India level entrance examination 2001 conducted by **Jawaharlal Nehru University New Delhi** for admission to **M.Phil / Ph.D programme** in the School Of Life Sciences.

TECHNIQUES KNOWN

- ❖ **Molecular Biology:** Gene Cloning expression and purification which includes:
 - Isolation of Total RNA.
 - Conversion of RNA to cDNA by using oligo-dT Primer
 - RT-PCR by using gene specific Primer
 - Purification of PCR Product
 - Gene cloning
 - Transformation into Bacterial cells
 - Induction by IPTG, followed by SDS-PAGE to confirm the expression
 - Detection of expressed protein by Western blot technique

- Purification of expressed protein by affinity chromatography technique
- ❖ **PCR:** Primer Designing for PCR, Isolation of Total RNA from Tissues as well as Cells grown in suspension, Isolation of Plasmid DNA, Elution of DNA from Gel, Restriction Digestion and ligation.
- ❖ **Protein works:** Purification of recombinant protein by affinity chromatography (Akta prime plus from Amersham biosciences).
- ❖ **Electrophoresis Techniques:** Electrophoresis of DNA/RNA on Agarose gel. Electrophoresis of protein on SDS-PAGE.
- ❖ **Blotting Technique:** Northern and Western Blotting.
- ❖ **Cell Culture:** Malaria parasite culture, Preparation of culture media, Culturing of Human Embryonic Kidney (HEK)-293 cell line; Maintenance of cell line; Transfection, Total RNA isolation, and RT-PCR to check gene expression profile etc.
- ❖ **Microbiological Techniques:** Competent cell preparation, Transformation, preparation of culture media, streaking, spreading, Culturing of Bacteria etc.
- ❖ **Biochemical Estimation** of DNA, RNA, and Protein concentration estimation (Bradford reagent).
- ❖ **Computational Skills:** Working knowledge of computer; MS windows, MS office, Excel, power point, Internet surfing & its various application for research purposes. I also have exposure to scientific Programme like Mac Vector programme, Clustal-X, Clustal-W, Sigma Plot, Blast family of programs, Primer designing, Sequence analysis, Retrieval of data from various databases, Gene Scan, Protein databases, EXPASY, Gel Documentation Programme etc.
- ❖ **Microscopic technique:** Confocal Microscopy, Fluorescent microscopy etc.
- ❖ **Molecular techniques:** DNA/RNA-protein interaction study by Electrophoretically mobility shift assay, ATPase assay, Helicase assay etc.
- ❖ **Immunological techniques:** Antibody production in mice and ELISA.

OTHER ACTIVITIES/SKILLS

- Had been taken Practical classes for the of M. Sc students on Gene Expression which involves teaching them how to amplify an ORF through PCR, Put it in a cloning vector, digest and subclone it in an expression vector and finally screen clones through expression on an SDS-PAGE.
- Had been trained MSc. Students from different Universities in projects related to IRF-2 for the two years.
- Working knowledge of computer programmes that are required for scientific research

SEMINAR PRESENTED

- ❖ RNaseL and apoptosis
- ❖ Interferon Regulatory Factors
- ❖ Hematopoietic Stem Cell
- ❖ IRF-2 regulated genes

PUBLICATIONS

- ❖ Pardeep Kumar¹, Somnath Mukharjee¹, **Krishna Prakash**¹, R. K. Kale², P. Mclean² and Nazma zaheer baquer^{1*}. Antidiabetic effects of Trigonella foenum-graecum seed powder in a rat model. (2011). Toxicology and environmental chemistry J. (Accepted for publication)
- ❖ Satish K. Gupta^{a*}, N. Gupta^a, P. Suman^a, S. Choudhury^a, **K. Prakash**^a, T. Gupta^a, R. Sriraman^b, S. B. Nagendrakumar^b and V. A. Srinivasan^b. Contraceptive vaccines for human and animal utility. (2010) *Journal of Reproductive Immunology* 2011 Mar; 88(2):240-6..
- ❖ **Krishna Prakash**^{*} and Pramod C. Rath. Replacement of the C-terminal tetrapeptide (³¹⁴PAPV³¹⁷ to ³¹⁴SSSM³¹⁷) in Interferon Regulatory Factor-2 alters its N-terminal DNA binding activity. *J. Biosciences* 35(4), December 2010.
- ❖ **Krishna Prakash** and Renu Tuteja^{*}. A novel DEAD box helicase Has1p from *Plasmodium falciparum*: N-terminal is essential for activity. International parasitology. *Parasitol Int.* 2010 Jun; 59(2):271-7. Epub 2010 Feb 11
- ❖ **Krishna Prakash**^{*} and Pramod C. Rath. Expression, Purification and the DNA binding activity of the recombinant Interferon Regulatory Factor-2 (IRF-2) from mouse. *Molecular Biology Reports* (2011) Mol Biol Rep. 2011 May 11. [Epub ahead of print] PubMed PMID: 21559834.

PERSONAL PROFILE

Father's Name	:	Sri S. R. Thakur
Date of Birth	:	24 th April 1975.
Sex	:	Male
Marital Status	:	Married
Nationality	:	Indian
Language Known	:	Hindi and English.
Mailing Address	:	S/O Sri S. R. Thakur. Pratap Nagar, Mehsole Sitamarhi, Bihar, 843302, India

REFERENCES

- ❖ Dr. P.C. Rath
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(Krishna Prakash)