



*Curriculum Vitae*  
of  
**Vikas Handa**

Phone: 09463930451  
Email: vikas.handa@thapar.edu

## **Professional Information**

I am working as Assistant Professor in Department of Biotechnology and Environmental Sciences, Thapar University, Patiala since December 2009. Prior to that I was associated with Lovely Professional University, Phagwara. I have been awarded PhD in Biotechnology by Centre for Biotechnology, Jawaharlal Nehru University. Then I joined Institut fuer Biochemie, Justus Liebig Universitaet, Giessen, Germany for Post Doctoral research. Then I worked as a Guest Scientist in German Cancer Research Centre, Heidelberg, Germany.

My research interests include Epigenetics and Gene regulation. Presently I am working on influence of sequence on DNA methylation propensity in humans genome using computational approaches.

## **Academics**

### **Assistant Professor, Dec 2009-**

**Department of Biotechnology and Environmental Studies, Thapar University, Patiala**

Teaching Genomics & Proteomics, Concepts in Biotechnology, Bio-Techniques and Environmental studies to Masters, Bachelor & Graduate classes. I have also been involved in conducting entrance examination for MSc and PhD Biotechnology programmes. I also guided three BTech Biotechnology students in short research projects.

### **Professor & Officiating Head of Department, Feb 2007- Dec 2009**

**Department of Biotechnology, Lovely Professional University, Phagwara**

- Professor in Department of Biotechnology
- Officiating Head, Department of Biotechnology
- Curriculum Development of Programmes running in Department of Biotechnology
- Research activities in the Department

Taught courses in Genetic Engineering, Molecular Biology, Genomics & Proteomics and Biochemical & Biophysical Techniques for Masters students of Biotechnology and Microbiology. For some time I was also engaged in administration of the department of Biotechnology. I have also been given responsibility of developing curricula of newly introduced programmes and upgrading curricula of existing programmes of the department.

I have also supervised Masters and co-supervised MPhil students in research projects.

### **Guest Scientist, 2005 –2007**

**Deutsches Krebs Forchungs Zentrum (DKFZ), Heidelberg, Germany**

The project I worked on involved investigating the mechanism of targeted DNA demethylation. Mammalian genome undergoes active DNA demethylation during gametogenesis and early embryogenesis. Recent studies have shown activation of pluripotency marker genes during nuclear reprogramming of differentiated cells via targeted DNA demethylation. Solving the

question of targeted demethylation may lead to manipulation of epigenetic state of differentiated cell contributing emphatically in the field of stem cell research.

Stem cell pluripotency marker gene Oct4 is known to undergo active DNA demethylation when differentiated cells are subjected to nuclear reprogramming using oocyte or early embryo extracts. In our laboratory Gadd45a (Growth arrest & DNA damage protein) has been found to be playing key role in active DNA demethylation via Nucleotide Excision Repair (NER) mechanism. NER factors XPG & XPB have been found to be associated with Gadd45a in the process of DNA demethylation. Cell biology & molecular approaches are being employed to find out factors responsible for and hence underlying mechanism of targeting of demethylation activity in the promoter region of Oct4 gene (*Barreto G et al, 2007*).

## **Post doctoral research, 2002 – 2004**

**Institut für Biochemie, Justus-Liebig Universität, Giessen, Germany**

I studied CpG flanking sequence preference of mammalian *de novo* methyltransferases and its biological significance. The cytosines in CpG dinucleotide context are found methylated in vertebrates genomes. This epigenetic change plays important role in gene imprinting, X chromosome inactivation, gene regulation, embryonic development and pathogenesis of cancer. The aim of the project was to study effect of flanking bases on CpG methylation using coupled molecular and computational approach. (*Handa V & Jeltsch A, 2005*)

In parallel I worked on another project on developing Programmable DNA Methyltransferase for highly specific methylation of DNA. Since DNA methylation leads to silencing of gene expression, these enzymes could be used to repress expression of any target gene by directed methylation *in vivo*. Using onco genes or genes of viral origin as target, it can be used as therapeutic agent against cancer and viral diseases. The advantage of this method is that DNA-methylation is heritable hence there is no need of life-long therapy involving toxic substances. I also contributed in project on DNA-protein interactions & catalytic mechanism of Dnmt3a (*Gowher et al, 2006*).

I was involved in practical classes of Masters Students and guiding (in part) Masters & PhD students.

## **PhD, Biotechnology, 1995 - 2001**

**Centre for Biotechnology, Jawaharlal Nehru University, New Delhi**

Secured an 8.43 CGPA in 16 credit course-work covering courses on Animal Virology, Application of computers in Biotechnology, Microvax and GCG Package, Research Methodology, Instrumentation and Journal Club in the first two semesters

**Thesis title: Identification and purification of liver-specific factor(s) that activate human apo(a) gene transcription**

The project was to study transcriptional regulation of human apo(a) gene that has been associated with atherosclerosis. This gene is expressed in liver in a tissue specific manner in human and some primates only. A combination of reporter gene assays using 5' flanking region of the gene and DNA-Protein interaction studies was used to address the problem. 700 bp region upstream of gene was found to be interacting with multiple protein factors resulting in transcriptional activation. (*Handa V et al, 2002 & Negi S et al, 2004*)

## **Publications**

Barreto G, Schäfer A, Marhold J, Stach D, Swaminathan SK, **Handa V**, Döderlein G, Maltry N, Wu W, Lyko F and Niehrs C (2007) Gadd45a promotes epigenetic gene activation by repair-mediated DNA demethylation *Nature* **445** 671-675 [PMID: 17268471]

Gowher H, Loutchanwoot P, Vorobjeva O, **Handa V**, Jurkowska RZ, Jurkowski TP, Jeltsch A (2006) Mutational analysis of the catalytic domain of the murine Dnmt3a DNA-(cytosine C5)-methyltransferase. *J Mol Biol* **357** 928-941 [PMID: 16472822]

**Handa V** and Jeltsch A (2005) Profound flanking sequence preference of dnmt3a and dnmt3b Mammalian DNA methyltransferases shape the human epigenome. *J Mol Biol* **348** 1103-1112 [PMID: 15854647]

**Handa V** and Jeltsch A (2004) Anomalous mobility of PCR products after bisulfite treatment of DNA. *Anal Biochem* **333** 196-198 [PMID: 15351297]

Negi S, Singh SK, Pati N, **Handa V**, Chauhan R and Pati U (2004) A proximal tissue-specific module and a distal negative regulatory module control apolipoprotein(a) gene transcription. *Biochem J* **379** 151-159 [PMID: 14680477]

**Handa V**, Mahboob-ul-hussain, Pati N and Pati U (2002) Multiple liver-specific factors bind to a 64-bp element and activate apo(a) gene. *Biochem Biophys Res Commun* **292** 243-249 [PMID: 11890699]

### **Junior Research Fellow, 1994-1995**

**Department of Biochemistry, Jamia Hamdard University, New Delhi**

Worked as a Junior Research Fellow in a Department of Biotechnology sponsored project on Characterisation and Modulation of Biosynthetic Pathway of Artemisinin

### **M. Sc. Biotechnology, 1992-1994**

**Centre for Biotechnology, Maharaja Sayajirao University of Baroda, Baroda.**

A two-year masters program covering the following subjects: Prokaryotic and Eukaryotic Molecular Biology, Genetic Engineering, Biophysics, Biostatistics, Biochemistry, Environmental Biology, Microbiology, Biochemical Engineering, Developmental Biology, Plant Physiology & Plant Tissue-culture and Immunology.

- *Dissertation*: Studies on Cytokinin Induced Inhibition of Dormancy Break in *Kalanchoe mortagei*.
- *Seminar*: Protein engineering and its industrial implication
- *Project proposal*: Effect of protein splicing on prokaryotic mRNA stability

### **B. Sc. (Honours) Chemistry, 1989-1992**

**Atma Ram Sanatan Dharm College, University of Delhi, New Delhi**

A three-year bachelors program covering the following subjects: Inorganic Chemistry, Organic Chemistry & Physical Chemistry as main subjects and Mathematics & Physics as subsidiary subjects

### **AISSE XII Grade, 1989**

**Central Board of Secondary Education, Kendriya Vidyalaya, Janakpuri, New Delhi**

Subjects: Mathematics, Physics, Chemistry, English & Biology

### **AISSE X Grade, 1987**

**Central Board of Secondary Education, Kendriya Vidyalaya, Janakpuri, New Delhi**

Subjects: Mathematics, Sciences, Social Sciences, Hindi & English

## **Academic Accomplishments**

- Qualified the Joint **CSIR-UGC** (Council of Scientific & Industrial Research - University Grants Commission) Test for Junior Research Fellowship and Eligibility for Lecturer ship (July 1995)
- Qualified **GATE-94** (Graduate Aptitude Test in Engineering) with a score of 96.91 percentile

## **Participations**

- Co-organized National Conference on Emerging Trends in Biopharmaceuticals: Relevance to Human Health in Thapar University, Patiala (11<sup>th</sup> – 13<sup>th</sup> November, 2010)
- Attended workshop on Intellectual Property Rights organized in National Institute of Technology, Jalandhar (2008)

- Attended a Bioinformatics workshop (HUSAR/GCG Sequence Analysis Package) in dkfz, Heidelberg (2005)
- Attended a symposium titled '*DNA Methylation – An important signal: Its significance in Biology and Pathogenesis*' organised in Weissenburg, Germany (2004)
- Presented a poster at the 67<sup>th</sup> annual meet of society of biological chemists (India) held Jawaharlal Nehru University, New Delhi (1998) on *Activation of apo(a) gene transcription by four HepG2 specific factors*
- Attended a workshop on DNA and Protein footprinting, organised at Centre for Cellular & Molecular Biology, Hyderabad (1997)
- Attended a workshop on Self-Fabricated Instruments, organised by Department of Chemistry, Maitreyi College and Centre for Science Education & Communication, University of Delhi (1991)

## **Personal Information**

- Languages known: English, Hindi and Punjabi
- Born (24<sup>th</sup> September 1971) and brought up in India
- Permanent residence in New Delhi

Vikas Handa