

Dr. Surendra Nimesh
UGC Assistant Professor,
Department of Biotechnology,
School of Life Sciences,
Central University of Rajasthan,
Bandarsindri, N.H. 8, Kishangarh-305801
Dist. Ajmer, Rajasthan, India
Phone: 91-9468949252

EDUCATION

- Ph.D.** Biomedical Science, Nanotechnology (2001-2007)
Dr. B.R. Ambedkar Center for Biomedical Research (ACBR),
University of Delhi, Delhi
- M.Sc.** Biomedical Science (1999-2001)
ACBR, University of Delhi, Delhi
- B.Sc.** Zoology, Botany, Chemistry (1995-1998)
Maharaja's College, University of Rajasthan, Jaipur

Certified courses

Radioprotection Course (2009), Clinical Research Institute of Montreal, Montreal.
Course in Good Laboratory Practices (2009), École Polytechnique of Montreal, Montreal.
Course in Experimental Animal Handling (2009), University of Montreal, Montreal.
Advanced Course in Laboratory Safety (2007), University of Montreal, Montreal.
The Workshop on Materials Characterization (2007), Perkin Elmer, Montreal.
Simdut Training (2007), École Polytechnique of Montreal, Montreal.

AWARDS AND FELLOWSHIPS

- 1. Young Scientist Project (2012)**
Science & Engineering Research Board (SERB), Department of Science and Technology (SERC Fast Track Proposals for Young Scientists Scheme), Government of India, entitled, "Novel receptor targeted nanotechnology based gene silencing approach to suppress metabolic function of PCSK9 gene for treatment of hypercholesterolemia"
- 2. Visiting Fellowship (Jan 2012 – March 2013)**
Awarded visiting fellowship from Natural Science and Engineering Research Council of Canada (NSERC), for working in Canadian Government Research Laboratory (Health Canada).
- 3. Best poster award (2010)**
Gordon Research Conferences, Proprotein Processing, Trafficking & Secretion: Latest Insights into Molecular Mechanisms, Disease and Therapeutic Applications, 18-23 Jun 2010, Colby-Sawyer College, New London, NH, US.
- 4. Young Scientist Project (2007)**
Department of Science and Technology (SERC Fast Track Proposals for Young Scientists Scheme), Government of India, entitled "Design and Preparation of Nanoparticle and Nanoparticulate based Efficient Gene and siRNA Delivery Systems"

5. **Senior Research Fellowship (Aug 2003- Jul 2006) (SRF)**

Junior Research Fellowship (Aug 2001- Jul 2003) (JRF)

Qualified Council of Scientific and Industrial Research- University Grants Commission's Junior Research Fellowship (JRF) and Eligibility for Lectureship - National Eligibility Test (NET), Dec. 2000.

RESEARCH EXPERIENCE

Postdoctoral Fellow: Inhalation Toxicology Laboratory / Hazard Identification Division, Environmental Health Science and Research Bureau, Health Canada, Ottawa, Canada (Jan 2012 – Mar 2013). Project, "Investigation of Physicochemical Properties and Toxicity of Silica oxide and Titanium Dioxide Nanomaterials"

Research Assistant: Biomedical Technology and Cell Therapy Research Laboratory, McGill University, Montreal (May 2011- Dec 2011). Project, "Novel Receptor Targeted Nanotechnology based Gene Silencing Approach to Suppress Cellular Function of PCSK9"

Postdoctoral Fellow: Biochemical Neuroendocrinology Laboratory, Clinical Research Institute of Montreal, Montreal (Nov. 2009- Apr. 2011). Projects, "The Role of PCSK9 in Hepatitis C Virus Infection", and "Single Domain Antibodies Based Approach to Suppress Cellular Function of PCSK9"

Postdoctoral Fellow: Department of Chemical Engineering, Ecole Polytechnique of Montreal, Montreal (Aug. 2007- Aug. 2009). Project "Investigation of Transfection Efficiency, Uptake and Cytotoxicity of various Chitosan-DNA Complexes and Influence of Different Transfection Conditions"

Doctoral Research: Dr. B.R. Ambedkar Center for Biomedical Research, University of Delhi, Delhi and Nucleic Acid Research Lab, Institute of Genomics and Integrative Biology (CSIR), Delhi (Jul. 2001 – Aug. 2007). Title "Development of Nanoparticle Based Carrier Systems for the Delivery of Biomolecules"

Masters Dissertation: Nucleic Acid Research Lab, Institute of Genomics and Integrative Biology (CSIR), Delhi (Jan. 2001- Jun. 2001). Title "Synthesis and Characterization of Modified Oligonucleotides using MALDI-TOF Mass Spectrometry"

Masters Summer Project: Nucleic Acid Research Lab, Institute of Genomics and Integrative Biology (CSIR), Delhi (May 2000 -Jul. 2000). Title "Preparation and Characterization of Peptide Sequence using MALDI"

RESEARCH INTERESTS

Design and development of nanoparticle based novel delivery systems for efficient and targeted delivery of drugs, genes and siRNAs for therapeutics with emphasis on treatment of cardiovascular diseases.

TECHNICAL SKILLS

Nanotechnology

Design, preparation and characterization of novel polymeric nanoparticles using highly sophisticated scientific techniques such as transmission electron microscopy (TEM), atomic force microscopy (AFM), dynamic light scattering (DLS).

Application of nanoparticles for *in vitro* drug release employing spectroscopic techniques such as Fluorescence, UV-Vis, IR spectrometry.

Gene and siRNA delivery efficiency of nanoparticles estimated using flow cytometry (FACS), Fluorescence spectrometry and Luminometry.

Analytical method development for estimation of *in vitro* cytotoxicity of nanoparticles involving various cytotoxicity assays e.g. MTT, Alamar blue, LDH.

Molecular Biology

DNA isolation (genomic/plasmid) purification and quantification, RNA isolation (mammalian cells), PCR, Reverse Transcriptase PCR, SDS-PAGE, ELISA, Enzyme kinetics and various enzyme-substrate assays by UV/Vis spectroscopy, Luciferase assay.

Animal handling

Investigation of drugs that regulates functioning of heart in frogs and mice. Studied effect of various drugs on rabbit eyes and ileum. Immunization studies for generation of antibodies in mice.

Other techniques

Maintenance of mammalian cell culture, Immunocytochemistry and use of Confocal Microscopy (CLSM) in cellular tracking studies, Matrix-assisted laser desorption ionization (MALDI) to determine molecular weight of oligonucleotides and peptides, High Performance Liquid Chromatography (HPLC) for oligonucleotide purification, Fast Protein Liquid Chromatography (FPLC) for protein purification, Gene assembler plus for oligonucleotide synthesis.

PUBLICATIONS

Research Articles

1. Improved transfection efficiency of chitosan-DNA complexes employing reverse transfection. **Surendra Nimesh***, A. Saxena, A. Kumar, R. Chandra. J. Appl. Polym. Sc.124 (2012) 1771-1777.
2. Enhanced gene delivery mediated by low molecular weight chitosan/DNA complexes: Effect of pH and serum. **Surendra Nimesh**, M. M. Thibault, M. Lavertu, M.D. Buschmann. Mol. Biotechnol. 46(2010) 182-196.
3. Intracellular trafficking and decondensation kinetics of chitosan-pDNA polyplexes. M. M. Thibault, **Surendra Nimesh**, M. Lavertu, M.D. Buschmann. Mol. Ther. 18(2010) 1787-1795.
4. Controlled size chitosan nanoparticles as an efficient, biocompatible oligonucleotides delivery system. R. Manchanda, **Surendra Nimesh**. J. Appl. Polym. Sc. 118(2010) 2071-2077.
5. Polyethylenimine nanoparticles as an efficient *in vitro* siRNA delivery system. **Surendra Nimesh***, R. Chandra. Eur. J. Pharm. Biopharm. 73(2009) 43-49.
6. Guanidinium-grafted polyethylenimine: An efficient transfecting agent for mammalian cells. **Surendra Nimesh***, R. Chandra. Eur. J. Pharm. Biopharm. 68(2008) 647-655.

7. Influence of acyl chain length on transfection mediated by acylated PEI nanoparticles. **Surendra Nimesh**, A. Aggarwal, P.Kumar, Y. Singh, K.C. Gupta, R. Chandra. *Int. J. Pharm.* 337 (2007) 265-274.
8. Synthesis, characterization and in vitro biological studies of novel cyano derivatives of N-alkyl and N-aryl piperazine. P. Chaudhary, **Surendra Nimesh**, V. Yadav, A.K. Verma, R. Kumar. *Eur. J. Med. Chem.* 42 (2006) 471-476.
9. Preparation, characterization and in vitro drug release studies of novel polymeric nanoparticles **Surendra Nimesh**, R. Kumar, A. Saxena, P. Chaudhary, V. Yadav, S. Mozumdar, R. Chandra. *Int. J. Pharm.* 323 (2006) 146-152.
10. PEI-alginate nanocomposites as efficient in vitro gene transfection agents. S. Patnaik, A. Aggarwal, **Surendra Nimesh**, A. Goel, M. Ganguli, N. Saini, Y. Singh, K.C. Gupta. *J. Control. Release* 114 (2006) 398-409.
11. Novel polyallylamine- dextran sulfate-DNA nanoplexes: Highly efficient non-viral vector for gene delivery. **Surendra Nimesh**, R. Kumar, R. Chandra. *Int. J. Pharm.* 320 (2006) 143-149.
12. An efficient synthesis of 1, 5-benzodiazepine derivatives catalyzed by silver nitrate. R. Kumar, P. Chaudhary, **Surendra Nimesh**, A.K. Verma, R. Chandra. *Green Chem.* 8 (2006) 519-521.
13. Polyethylene glycol as a non-ionic liquid solvent for Michael addition reaction of amines to conjugated alkenes. R. Kumar, P. Chaudhary, **Surendra Nimesh**, R. Chandra. *Green Chem.* 8 (2006) 356-358.
14. Polyethylenimine nanoparticles as efficient transfecting agents for mammalian cells. **Surendra Nimesh**, A. Goyal, V. Pawar, S. Jayaraman, P. Kumar, R. Chandra, Y. Singh, K. C. Gupta. *J. Control. Release* 110 (2006) 457-468.

Review Articles

1. The rise of the nano, **Surendra Nimesh***, *Eur. Biopharm. Rev.* April (2013) 22-24.
2. Potential implications of physicochemical characterization on in vitro and in vivo gene delivery, **Surendra Nimesh***, *Ther. Del.* 3 (2012) 1347-1356.
3. Polyethylenimine as a promising vector for targeted siRNA delivery, **Surendra Nimesh***, *Curr. Clin. Pharmacol.* 7 (2012) 121-130.
4. Recent patents in siRNA delivery employing nanoparticles as delivery vectors, **Surendra Nimesh*** *Recent Pat DNA Gene Seq.* 6 (2012) 91-97.
5. Cationic Polymer based Nanocarriers for Delivery of Therapeutic Nucleic Acids. **Surendra Nimesh***, N. Gupta, R. Chandra. *J. Biomed. Nanotechnol.* 7 (2011) 504-520.
6. Strategies and Advances in Nanomedicine for Targeted siRNA Delivery. **Surendra Nimesh***, N. Gupta, R. Chandra. *Nanomedicine* 6 (2011) 729-746.

Book Chapters

1. Application of Polyethylenimine Based Nanoparticles for RNA Therapeutics. **Surendra Nimesh***, R. Chandra. In *Selected Topics in Nanotechnology*, Ed: TMS Chang (World Scientific Publishing, US) 2012 (In press).

2. Chitosan Based Nanocarriers for Efficient and Targeted siRNA Delivery. **Surendra Nimesh***, R. Chandra. In Selected Topics in Nanotechnology, Ed: TMS Chang (World Scientific Publishing, US) 2012 (In press).
3. Nanomedicine Based Strategies for RNA Therapeutics. **Surendra Nimesh***, N. Gupta, R. Chandra. In RNA Degradation, Editor: Frank Columbus (Nova Science Publishers Inc., US) 2011.
4. Polymeric nanoparticles as efficient siRNA delivery systems. **Surendra Nimesh***, N. Gupta, R. Chandra. In Gene Silencing: Theory, Techniques and Applications, Editor: Anthony J. Catalano (Nova Science Publishers Inc., US) 2010.

Books/ Monographs

1. Theory, Techniques and Applications of Nanotechnology in Gene Silencing. Editors: **Surendra Nimesh***, R. Chandra. River Publishers, Denmark (2012)
http://riverpublishers.com/river_publisher/view_details.php?book_id=92
2. Polymeric Nanoparticles for Efficient in vitro Gene Delivery, Editor: **Surendra Nimesh**, Lambert Academic Publishing, GmbH & Co. KG, Germany (2012)
<https://www.morebooks.de/store/gb/book/polymeric-nanoparticles-for-efficient-in-vitro-gene-delivery/isbn/978-3-659-10457-2>
*corresponding author

SEMINARS / SYMPOSIUM / CONFERENCES ATTENDED:

1. 16th International Biomedical Science and Technology Symposium (BIOMED 2010), 28 Sep - 2 Oct 2010, Istanbul, Turkey. **Invited speaker**, title of presentation, “Efficient Gene Delivery Mediated by Low Molecular Weight Chitosan/pDNA Polyplexes”.
2. Second World Congress, IANM II (NANOMED 2010), 3-6 Oct 2010, Antalya, Turkey. **Invited Speaker**, title of presentation, “Gene Delivery using Chitosan/DNA Complexes”.
3. Gordon Research Conferences, Proprotein Processing, Trafficking & Secretion: Latest Insights into Molecular Mechanisms, Disease and Therapeutic Applications, 18-23 Jun 2010, Colby-Sawyer College, New London, NH, US. **Poster** title, “Single Domain Antibody Approach to Suppress Function of PCSK9”. Won **best poster** award.
4. International Conference on Chemistry Biology Interface: Synergistic New Frontiers, 21-26th Nov. 2004, B.R. Ambedkar Center for Bio-Medical Research, University of Delhi, Delhi-110007, India. **Poster** title, “Polyethylenimine Nanoparticles as Efficient Transfecting Agents for Mammalian Cells”.
5. International Conference on Recent Advances in Biomedical & Therapeutic Sciences, 13-15th Jan. 2004, Jhansi, Uttar Pradesh, India.
6. 4th Annual Symposium on Frontiers in Biomedical Research, 13-15th April 2003, B.R. Ambedkar Center for Bio-Medical Research, University of Delhi, Delhi-110007, India.
7. National Conference on Emerging Areas in Biomedical Sciences, 28-30th Dec. 2002, Jhansi, Uttar Pradesh, India.
8. Indian Science Congress 87th Session, 3-7 January 2000, University of Pune, India.