

# CURRICULUM VITAE

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## Dr. MANOJ KUMAR PATEL (Ph.D.)

Assistant Professor, School of Studies in Life Science

Principal Investigator, Nano-Biology Laboratory

Pt. Ravishankar Shukla University, Amanaka, G.E. Road, Raipur - 492 010 (C.G.), India

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### Education:

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- Ph.D. (2014): Nano-Biotechnology, Jamia Millia Islamia and CSIR-NPL, New Delhi, India
- M.Sc. (2006): Biotechnology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), India
- B.Sc. (2004): Microbiology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), India

### Professional Experience:

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- Assistant Professor (06/2017-Till Date), Pt. Ravishankar Shukla University, Raipur
- RCB - Young Investigator (06/2016-05/2017), Regional Centre for Biotechnology, Faridabad
- Postdoctoral Research Fellow (05/2015-05/2016), Oklahoma State University, Stillwater, USA
- Postdoctoral Research Fellow (09/2014-05/2015), Jawaharlal Nehru University, New Delhi
- Research Associate (07/2014-09/2014), Institute of Pesticides Formulation Technology, Gurgaon
- Senior Research Fellow (05/2013-02/2014), CSIR-National Physical Laboratory, New Delhi
- CSIR-Senior Research Fellow (04/2010-03/2013), CSIR-National Physical Laboratory, New Delhi
- Senior Research Fellow (05/2009-03/2010), CSIR-National Physical Laboratory, New Delhi
- Research Fellow (03/2007-04/2009), CSIR-Institute of Genomics and Integrative Biology, Delhi

### Honors / Awards:

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- Young Investigator award, Awarded by RCB, Faridabad, India
- Fast Track Young Scientist Award, Awarded by DST-SERB, New Delhi
- Dr. DSK Postdoctoral Research Fellowship, awarded by UGC, New Delhi
- CSIR-Senior Research Fellowship, Awarded by CSIR-HRDG, New Delhi
- Best Poster Award in NCBST-2013 at CSIR-National Physical Laboratory, New Delhi
- First Poster Prize in NSNT-2012 at Indian Institute of Technology, Mandi
- Dr. R. Chandrasekhar Memorial Prize in NSPTS-17 at Jamia Millia Islamia, New Delhi

### Area of Interest:

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- Nano-Biology / Nano-Biotechnology
- Medical Microbiology / Clinical Diagnostics
- Nano-Biosensors / Nano-Devices
- Nanomedicine / Nanomaterials Based Drug Delivery
- Biomaterials / Bioengineering
- Microfluidics / Lab-on-a-Chip Devices



## Research Publications:

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- Gayan Premaratne, Jinesh Niroula, **Manoj K. Patel**, W. Zhong, S. L. Suib, K. A. Kalkan and Sadagopan Krishnan. Electrochemical and Surface Plasmon Correlation of Serum Autoantibody Immunoassay with Binding Insights: Graphenyl vs. Mercapto-Monolayer Surface. *Analytical Chemistry* (2018) 90 (21): 12456-12463 [I.F: 6.785].
- Sandeep Kumar Verma, Ashok Kumar Das, **Manoj K. Patel**, Ashish Shah, Vinay Kumar, Saikat Gantait. Engineered Nanomaterials for Plant Growth and Development: A Perspective Analysis. *Science of the Total Environment* (2018) 630:1413-1435 [I.F: 6.551].
- **Manoj K. Patel**, Md. Azahar Ali, Sadagopan Krishnan, Ved Varun Agrawal, Al A. A. Kheraif, H. Fouad, Z. A. Ansari, S. G. Ansari and Bansi D. Malhotra. A Label-Free Photoluminescence Genosensor Using Nanostructure Magnesium Oxide for Cholera Detection. *Scientific Reports* (2015) 5:17384 [I.F: 4.576].
- Pratima R. Solanki, **Manoj K. Patel**, Md. Azahar Ali and Bansi D. Malhotra. Chitosan Modified Nickel Oxide Platform for Biosensing Applications. *Journal of Materials Chemistry B* (2015) 3: 6698-6708 [I.F: 5.344].
- **Manoj K. Patel**, Ved Varun Agrawal, Bansi D. Malhotra and S.G. Ansari. Nanostructured Magnesium Oxide: A Suitable Material for DNA Based Biosensors. *Materials Focus* (2014) 3:1-11.
- **Manoj K. Patel**, Md. Azahar Ali, Saurabh Srivastava, Ved Varun Agrawal, S. G. Ansari and Bansi D. Malhotra. Magnesium Oxide Grafted Carbon Nanotubes Based Impedimetric Genosensor for Biomedical Application. *Biosensors and Bioelectronics* (2013) 50: 406-413 [I.F: 10.257].
- **Manoj K. Patel**, Md. Azahar Ali, Md. Zafaryab, Ved Varun Agrawal, M. Moshahid Alam Rizvi, Z. A. Ansari, S. G. Ansari and Bansi D. Malhotra. Biocompatible Nanostructured Magnesium Oxide-Chitosan Platform for Genosensing Application. *Biosensors and Bioelectronics* (2013) 45: 181-188 [I.F: 10.257].
- **Manoj K. Patel**, Md. Azahar Ali, Ved Varun Agrawal, Z. A. Ansari, S. G. Ansari and Bansi D. Malhotra. Nanostructured Magnesium Oxide Biosensing Platform for Cholera Detection. *Applied Physics Letters* (2013) 102: 144106 [I.F: 3.597].
- Azahar Ali, P. R. Solanki, **Manoj K. Patel**, H. Dhayani, V. V. Agrawal, R. John and Bansi D. Malhotra. Highly Efficient Microfluidics Nano Biochip Based on Nanostructured Nickel Oxide. *Nanoscale* (2013) 5: 2883-2891 [I.F: 6.895].
- **Manoj K. Patel**, Jai Singh, Manish K. Singh, Ved V. Agrawal, S.G. Ansari and Bansi D. Malhotra. Tin Oxide Quantum Dot Based DNA Sensor for Pathogen Detection. *Journal of Nanoscience and Nanotechnology* (2013)13: 1671-1678 [I.F: 1.354].
- **Manoj K. Patel**, Md. Zafaryab, M. Moshed Alam Rizvi, Z. A. Ansari, Ved Varun Agrawal, Bansi D. Malhotra and S. G. Ansari. Antibacterial and Cytotoxic Effect of Magnesium Oxide Nanoparticles in Bacterial and Human Cells. *Journal of Nanoengineering and Nanomanufacturing* (2013) 3: 162-166.

- **Manoj K. Patel**, P. R. Solanki, Sachin Khandelwal, Ved V. Agrawal, S.G. Ansari and Bansi D. Malhotra. Self-Assembled Monolayer Based Nucleic Acid Sensor for *Vibrio cholerae* Detection. **Journal of Physics Conference Series** (2012) 358: 012009.
- **Manoj K. Patel**, Ved V. Agrawal, B. D. Malhotra and S.G. Ansari. DNA Based Diagnosis of *Vibrio cholerae* Infection. **Journal of Proteins and Proteomics** (2012) 3: 39.
- Pratima R. Solanki, **Manoj K. Patel**, Ajeet Kaushik, M.K. Pandey, R.K. Kotnala and Bansi D. Malhotra. Sol-gel Derived Nanostructured Metal Oxide Platform for Bacterial Detection. **Electroanalysis** (2011) 23: 2699-2708 [**I.F: 2.544**].
- **Manoj K. Patel**, Ved V. Agrawal, Z.A. Ansari, B. D. Malhotra and S.G. Ansari. Use of DNA Sequence in Nano-Biosensing Techniques. **Journal of Natural Science Biology and Medicine** (2011) 2: 134-135.
- **Manoj K. Patel**, P. R. Solanki, A. Kumar, S. Gupta, S. Khare and Bansi D. Malhotra. Electrochemical DNA Sensor for *Neisseria Meningitidis* Detection. **Biosensors and Bioelectronics** (2010) 25: 2586-2591 [**I.F: 10.257**].
- **Manoj K. Patel**, P. R. Solanki, S. Seth, S. Gupta, S. Khare, A. Kumar and Bansi D. Malhotra. *CtrA* Gene Based Electrochemical Sensor for Meningitis Detection. **Electrochemistry Communications** (2009) 11: 969-973 [**I.F: 4.333**].
- **Manoj K. Patel**, Suman and Ashok Kumar. Recent Laboratory Techniques for Diagnosis of Bacterial Meningitis. **Bioscience and Biotechnology Research Communications** (2008) 01:1-10.
- **Manoj K. Patel**, Sunil Gupta, Shashi Khare, Ashok Kumar. DNA Based Diagnosis of Bacterial Meningitis. **Indian Journal of Clinical Biochemistry** (2007) 22: 215.

### Book Chapter:

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- **Manoj K. Patel** and Pratima R. Solanki. Nanobiotechnology for Sensing Applications: From Lab to Field. Nanomaterials Based Immunosensors for Clinical Diagnostics Applications. **Apple Academic Press**, Waretown, New Jersey 08758 USA (2015) [ISBN: 9781771883283].

### Research Highlights:

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- Genosensor to Detect Cholera. **Nature India** (2015) [**DOI: 10.1038/nindia.2015.176**]
- Patel et al. **Materials Focus** (2014) 3: 1-11 [**Journal Cover Page Article**]
- Patel et al. **J. Nanoeng. Nanomanuf.** (2013) 3: 162-166 [**Journal Cover Page Article**]
- Sensor to Detect Cholera Quickly. **Nature India** (2013) [**DOI: 10.1038/nindia.2013.95**]
- Meningitis Sensor. **Nature India** (2010) [**DOI: 10.1038/nindia.2010.66**]
- DNA Detectives for Meningitis. **Nature India** (2009) [**DOI: 10.1038/nindia.2009.132**]

## Scientific Presentations (Talks):

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- Presenter: **Manoj K. Patel**  
Title: Magnesium Oxide Based Nucleic Acid Sensor for Cholera Detection  
Symposium: Proceeding of International Symposium on Physics & Technology of Sensors (ISPTS-1, 2012) held on 08-10 March 2012. Jointly Organized by Centre for Materials for Electronics Technology (C-MET) and University of Pune, India.
- Presenter: **Manoj K. Patel**  
Title: Magnesium Oxide-Chitosan Nano-Biocomposite for *Vibrio cholerae* Detection  
Workshop: Proceeding of **India - Japan** Workshop on Biomolecular Electronics & Organic Nanotechnology for Environment Preservation (IJWBME-2011) held on **07-10 December 2011**. Organized by Department of Electrical Engineering and Computer Sciences University of Hyogo, Japan.
- Presenter: **Manoj K. Patel**  
Title: Nucleic Acid Sensor for Quick Detection of Cholera Caused by *Vibrio cholerae*  
Conference: Proceeding of International Interdisciplinary Science Conference on Nano-Biotechnology: An Interface between Physics and Biology (I-ISC, 2010) held on 02-04 December 2010. Organized by Centre for Interdisciplinary Research in Basic Science, Jamia Millia Islamia, Jamia Nagar, New Delhi, India
- Presenter: **Manoj K. Patel**  
Title: DNA Biosensor for the Diagnosis of *N. meningitidis*  
Workshop: **National** Workshop on the topic “Immobilized Enzyme Technology for Sensors (NWIETS-2007)” held on **24 August - 02 September 2007**. Organized by Faculty of Life Science, Maharishi Dayanand University, Rohtak, Haryana, India.

## Scientific Presentations (Poster):

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- Presenter: **Manoj K. Patel**  
Title: Surface Plasmon Resonance Imaging of Onset of Type-1 Diabetes Based on Biomarkers other than Glucose  
Conference: Proceeding of **ACS Pentasectional Regional Meeting** held on **09 April 2016** at Oklahoma Wesleyan University, Oklahoma, United States.
- Presenter: **Manoj K. Patel**  
Title: Nanostructured Magnesium Oxide Based Genosensor for Biomedical Application  
Conference: Proceeding of **National** Conference on Biomedical Science and Technology (NCBST-2013) held on **21-22 November 2013**. Organized by CSIR-National Physical Laboratory, New Delhi, India.
- Presenter: **Manoj K. Patel**  
Title: Biocompatible Nanostructured Magnesium Oxide for Genosensing Application  
Seminar: Proceeding of 17<sup>th</sup> **National** Seminar on Physics and Technology of Sensors (NSPTS-2013) held on **11-13 March 2013**. Organized by Centre for Interdisciplinary Research in Basic Science, Jamia Millia Islamia, New Delhi, India.

- Presenter: **Manoj K. Patel**

Title: Magnesium Oxide Based Photoluminescence DNA Biosensor for Bacterial Detection

Workshop: Proceeding of **India - Japan** Workshop on Biomolecular Electronics & Organic Nanotechnology for Environment Preservation (IJWBME-2013) held on **13-15 December 2013**. Organized by Delhi Technological University and Department of Electrical Engineering, Kyushu Institute of Technology, Japan.

- Presenter: **Manoj K. Patel**

Title: Nanostructured Magnesium Oxide Based DNA Sensor

Symposium: Proceeding of **National** Symposium on Nano-Biotechnology (NSNT-2012) held on **01-02 June 2012**. Organized by Indian Institute of Technology, Mandi, Himachal Pradesh, India.

- Presenter: **Manoj K. Patel**

Title: DNA Based Diagnosis of *Vibrio cholerae* Infection

Conference: Proceeding of **International** Interdisciplinary Science Conference on Protein Folding and Diseases (I-ISC, 2012) held on **08-10 December 2012**. Organized by Centre for Interdisciplinary Research in Basic Science, Jamia Millia Islamia, Jamia Nagar, New Delhi, India.

- Presenter: **Manoj K. Patel**

Title: Nucleic Acid Sensor Based on SnO<sub>2</sub>-QDs for Cholera Detection

Conference: Proceeding of **International** Conference on Nanomaterials & Nanotechnology (ICNANO-2011) held on **18-21 December 2011**. Jointly Organized by International Association of Advanced Materials (IAAM), Advanced Materials Letters, VBRI Press and University of Delhi, India.

- Presenter: **Manoj K. Patel**

Title: Use of DNA Sequence in Nano-Biosensing Techniques

Conference: Proceeding of **International** Interdisciplinary Science Conference on Bioinformatics: An Interface between Computer Science and Biology (I-ISC, 2011) held on **15-17 November 2011**. Organized by CIRBSc, Jamia Millia Islamia, Jamia Nagar, New Delhi, India.

- Presenter: **Manoj K. Patel**

Title: Nanostructured Magnesium Oxide Based Electrochemical DNA Sensor for Cholera Detection

Conference: Proceeding of **International** Conference on Bio-Materials and Implants: Prospects & Possibilities in the New Millennium (BIO-2011) held on **21-23 July 2011**. Organized by Central Glass and Ceramic Research Institute (CGCRI), Kolkata, India.

- Presenter: **Manoj K. Patel**

Title: Nanostructured Zirconium Oxide Based Genosensor for Cholera Detection

Workshop: Proceeding of **India - Japan** Workshop on Biomolecular Electronics & Organic Nanotechnology for Environment Preservation (IJWBME-2009) held on **17-20 December 2009**. Organized by Department of Science and Technology Centre on Biomolecular Electronics, National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi, India & Department of Biological Functions and Engineering, Graduate School of Life Science Systems Engineering, Kitakyushu, Kyushu Institute of Technology, Japan.

- Presenter: **Manoj K. Patel**

Title: Amperometric Molecular Biosensor for Diagnosis of Infectious Disease Meningitis

Symposium: Proceeding of **National** Symposium on New Trends on Biosensor Technology (NSNTBT-2009) held on **17-19 January 2009**, Organized by Department of Physics, Hindustan College of Science & Technology, Farah (Mathura), U.P, India.

- Presenter: **Manoj K. Patel**

Title: Sensor for Quick Molecular Diagnosis of Meningitis Caused by *Neisseria meningitidis*

Conference: Proceeding of 49<sup>th</sup> Annual Conference of Association of Microbiologists of India (AMI), entitled “**International** Symposium on Microbial Biotechnology: Diversity, Genomics and Metagenomics, held on **18-20 November 2008**, Organized by Department of Zoology, University of Delhi, India.

- Presenter: **Manoj K. Patel**

Title: DNA Biosensor for Bacterial Meningitis in Humans

Conference: Proceeding of 48<sup>th</sup> Annual Conference of Association of Microbiologists of India (AMI), entitled “Microbes: Bio-factories of the Future, held on **18 - 21 December 2007**, Organized by Indian Institute of Technology, Chennai, Tamilnadu Unit, Association of Microbiologists of India.

- Presenter: **Manoj K. Patel**

Title: DNA Based Diagnosis of Bacterial Meningitis

Conference: Proceeding of 34<sup>th</sup> **National** conference of Association of Clinical Biochemists of India (ACBI), held on **17-20 December 2007**, Organized by Escorts Heart Institute & Research Centre Limited, New Delhi, India.

- Presenter: **Manoj K. Patel**

Title: DNA Biosensor for the Diagnosis of *N. meningitidis*

Workshop: Immobilized Enzyme Technology for Sensors (NWIETS-2007)” held on **24 August - 02 September 2007**. Organized by Faculty of Life Science, Maharishi Dayanand University, Rohtak, Haryana, India.

### **Scientific Meetings (Attended):**

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- International Seminar on “**Recent Advances in Sensors for Human Healthcare**” participated at Pt. Ravishankar Shukla University, Raipur held on 29 November 2019.
- Presented Poster entitled “**Nucleic Acid Biosensors for Clinical Diagnostics**” in Regional Centre for Biotechnology (RCB) colloquium held on 29<sup>th</sup>-30<sup>th</sup> September 2016.
- 22<sup>nd</sup> Annual Review Meet on “**DBT Network Project on Brucellosis**” participated at Jawaharlal Nehru University (JNU), New Delhi held on 21<sup>st</sup> - 22<sup>nd</sup> November 2014.
- National Symposium on “**New Horizon in Basic and Clinical Research**” participated at All India Institute of Medical Sciences (AIIMS), New Delhi held on 16<sup>th</sup> April 2012.
- National Symposium on “**Translational Research in Health Sciences**” participated at All India Institute of Medical Sciences (AIIMS), New Delhi held on 24<sup>th</sup> November 2009.

- National Workshop on “**Photonics**” participated at Dayal Singh College, University of Delhi, New Delhi held on 27<sup>th</sup> October 2009.
- 2<sup>nd</sup> National Conference on “**Innovations in Indian Science, Engineering and Technology**” participated at NPL, New Delhi held on 17 -19 July 2009.
- National Seminar on “**Environmental Lung Diseases**” participated at Vallabhbhai Patel Chest Institute, New Delhi held on 06 April 2009.
- International Symposium on “**Novel Strategies for Targeted Prevention and Treatment of Cancer**” participated at Jawaharlal Nehru University (JNU), New Delhi held on 19 -20 December 2008.
- National Workshop on “**Immobilized Enzyme Technology for Sensors (NWIETS - 2007)**” attended at Maharishi Dayanand University, Rohtak, Haryana held on 24 August - 02 September 2007.
- National Seminar on “**Emerging Horizons of Biotechnology**” attended at Guru Ghasidas Vishwavidyalaya, Bilaspur, held on 10 - 12 November 2006.

### Professional Skills:

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- **Microbiology**

Culture and Identification of Microorganisms, Molecular and Biochemical Characterizations, Handling of Infectious Pathogens and Biosafety Laboratory (BSL-1/2/3).

- **Biotechnology**

DNA Isolation, Polymerase Chain Reaction (PCR), Agarose Gel Electrophoresis, SDS-PAGE, Microbial, Plant and Animal Tissue Culture, DNA Sequencing and Sequence Analysis.

- **Nanotechnology**

Synthesis of Nanomaterials (Metal Oxides, Nanocarbon Materials & Quantum Dots), Characterizations, Application of Nanomaterials in Biosensors and Clinical Diagnostics.

- **Biosensors Development**

Bio-Electrochemistry, Nanobiosensors, Microfluidics and Lab-on-a-Chip Devices

- **Instrumentation**

Fourier Transform Infrared Spectroscopy (FT-IR), UV-Vis/NIR Spectrophotometer, X-Ray Diffraction (XRD), Photoluminescence (PL), Surface Plasmon Resonance Imaging (SPR-i), Cyclic Voltammetry (CV), Differential Pulse Voltammetry (DPV), Electrochemical Impedance (EIS), Contact Angle (CA), Atomic Force Microscopy (AFM), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy, Zetasizer measurement and Thin Film Deposition for Nanobiosensor Development.

- **Software's Applications**

Primer and Probe Designing, NCBI, PubMed, PDB Database, Analytical Softwares, Bioinformatics Software, Office Automation (M. S. Office), Window Operating Systems and Operation of Research Oriented Software's.

## Laboratory Skills:

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Knowledge of All Basic Interdisciplinary Laboratory Techniques Related to Microbiology, Molecular Biology, Immunology, Chemical and Physical Sciences Laboratory.

## Research Summary (ID: C-2967-2012):

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Total Publications	: 19	Book Chapter	: 01
Total Impact Factor	: 64	Total Citations	: 437
h-index	: 13	i10- Index	: 13
National Conference	: 08	International Conference	: 11

## Reviewer of the Scientific Journals:

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- **Nature:** Scientific Reports
- **Elsevier:** Sensor and Actuators B, Biosensors and Bioelectronics
- **Springer:** Applied Biochemistry & Biotechnology, 3-Biotech
- **Royal Society of Chemistry:** Journal of Materials Chemistry B
- **American Chemical Society:** ACS Sustainable Chemistry & Engineering
- **American Scientific Publishers:** Sensor Letters
- **Dove Press:** Reports in Electrochemistry, Nano-Biosensors in Disease Diagnosis  
Medical Devices: Evidence and Research, Nanotechnology, Science and Applications
- **Sciotechnol:** Journals of Nanomaterials & Molecular Nanotechnology
- **MDPI:** Biosensors

## Research Project Sanctioned/Ongoing/Completed:

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- **Sanctioned:** Science & Engineering Research Board (SERB) Sponsored Startup Research Grant (SRG) Project on “*Development of Nanomaterial Based Nanobiosensors for Clinical Diagnostics Applications*” (Ref. No. SRG/2019/000754), Amount: Rs. 27,24,700/-.

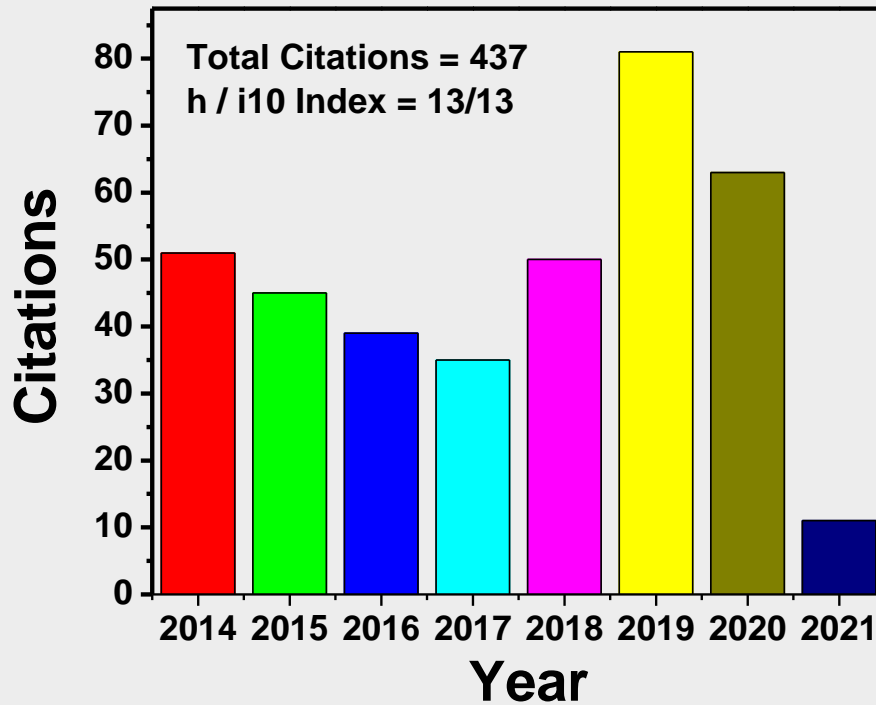
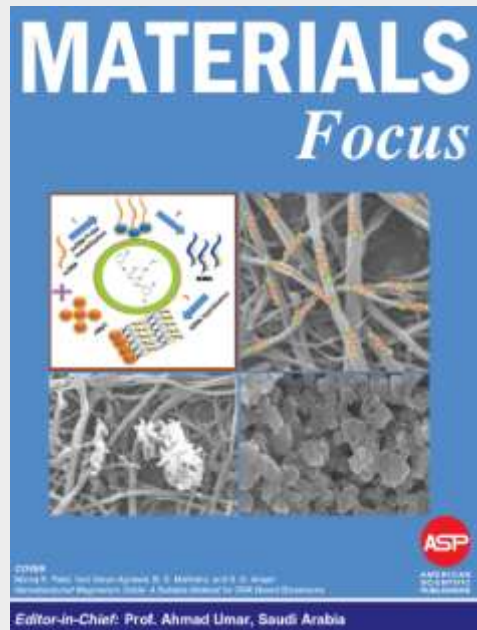
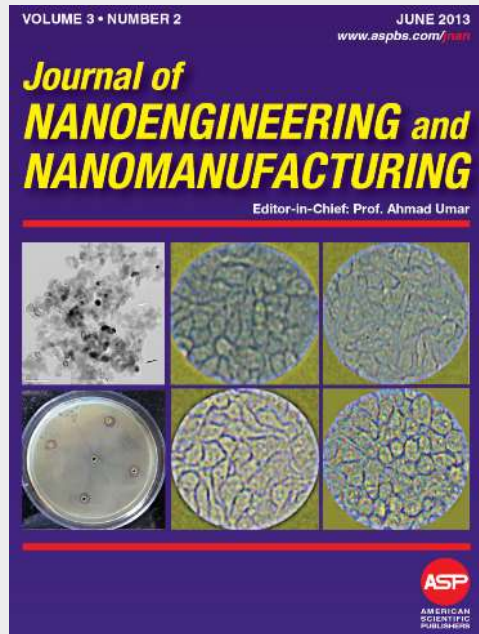
## Participation in Refresher/ Orientation/Short Term Training Program:

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- Participated in UGC Sponsored Refresher Program on “**Life Science and Biotechnology: Recent Trends, Advances and Challenges**” organized by Centre for Professional Development in Higher Education (HRDC-Centre) at University of Delhi, New Delhi, from 25<sup>th</sup> January 2021 to 08<sup>th</sup> February 2021.
- Participated in UGC Sponsored Orientation Program (OP-02) on “**Quality of Higher Education**” organized by Human Resource Development Centre at Pt. Ravishankar Shukla University, Raipur, Chhattisgarh, India from 09<sup>th</sup> September 2019 to 01<sup>st</sup> October 2019.



Cover Page Journal Articles and Citation Index:



Web Research Profiles:

- ORCID: <https://orcid.org/0000-0003-0764-5955>
- Researcher ID: [www.researcherid.com/rid/C-2967-2012](http://www.researcherid.com/rid/C-2967-2012)
- Research Gate: [https://www.researchgate.net/profile/Manoj\\_Patel9](https://www.researchgate.net/profile/Manoj_Patel9)
- Publoans: <https://publons.com/researcher/1662642/manoj-kumar-patel>
- Google Scholar: <https://scholar.google.co.in/citations?user=rsZApxoAAAAJ&hl=en>