

1. **Name** : **Dr.Vinita Vishwakarma**
2. **Designation & Present Institution** : **Scientist-E**  
**Centre for Nanoscience & Nanotechnology**  
*(A Joint Initiative of Indira Gandhi Centre for Atomic Research & Sathyabama University)*  
Jeppiaar Nagar, Chennai-600119, Tamilnadu
3. **Postal Address for Communication** : **Centre for Nanoscience & Nanotechnology**  
International Research Centre,  
Sathyabama University,  
Jeppiaar Nagar, Chennai-600119, Tamilnadu
4. **Phone no.** : 044-24502726-5642 (Extn),  
5. **Fax no.** : 044-24502736, Mobile: +91-9444719383  
6. **E-mail** : [vinitavishwakarma1@gmail.com](mailto:vinitavishwakarma1@gmail.com)

**7. Brief account of your research interests with special focus on Nano Science and Technology (strictly within 300 words):**

My research interest includes modification of Titanium (Ti) metal surface which has been used as condenser tubes in the cooling water systems and facing Biofouling problems. To control this, surface modification of Ti was carried out by developing nano thin films of Cu and Cu/Ni alloy on the Ti surface. Antimicrobial properties of surface were evaluated which showed an apparent decrease in bacterial attachment on modified Ti surfaces.

Another study of the work is to improve the concrete quality for nuclear industry by addition of nanomaterials having significantly higher compressive strength compared to that of the concrete without nanomaterials. We are attempting to achieve additional antibacterial and self cleaning properties and durability by Fly Ash concrete modification with nanomaterials.

**8. Key Words: Nanoparticles, Nano thin film, Antimicrobial, Biofouling, Concrete**

## Qualification Overview

- Well-qualified and technically proficient **Research Scientist** with more than 14 years laboratory experience.
- Research experience in the interdisciplinary area of **Surface Modification** of metallic substrates by nanocoatings.
- **Biofilm characterization** study of Titanium surface in aquatic environment and identification of bacteria upto species Level.
- **Concrete Modification** by different types of admixture and Nanomaterials
- Substantial experience in sophisticated research techniques and technologies.
- Expertise in lab and field research, data collection/analysis and project management.
- Extensive experience working with cross-functional scientific and research teams.
- Teaching to post graduates and doctoral level in selective areas of biosciences and Nanoscience.

## Techniques Used

- Microbiological techniques for isolation and pure culturing.
- Biochemical techniques for identification up to genus level.
- Concrete modification and Metallic Nanocoatings for biofouling control
- Microscopic techniques – Epifluorescence microscopy with acridine orange, DAPI and Live and death stain.
- Image analysis of Atomic Force Microscope (AFM), Glancing Incidence X-ray Diffraction (GIXRD) Scanning Electron Microscope (SEM) and energy-dispersive X-ray analyses (EDAX), Thermography, and Laser Raman spectroscopy.
- Spectrophotometric analysis of nutrients, chlorophyll, protein, carbohydrates in biofilms.
- Surface preparation of materials by pickling, polishing and by Pulsed DC magnetron sputtering, Pulse laser deposition (PLD), Electroless plating and Electrochemical plating.

## Research Thesis Coordinated/Guided

### Ph.D supervisor as Guide

1. **Mr.Manoj.L** “Development of UV/Vis active TiO<sub>2</sub> based Nano materials for self-cleaning and anti-bacterial activities on textiles”, Registration No. 2012199302, under Department of Physics, Sathyabama University, Chennai.

## Ph.D supervisor as Co-Guide

1. **Mr.D.Ramachandran** “Biodeterioration of Concrete Under Biofilms – Especially Sulphur Oxidising And Acid Producing Microbes”, Registration No. 2011799605, under Department of Chemistry, Sathyabama University, Chennai.

## *International Journal*

1. Surface Modification of Titanium Using Nanothin Films of Copper for Biofouling Control, **Vinita Vishwakarma**, N.Manoharan, R.P.George, S.Dash, M.Kamruddin, A.K.Tyagi and R.K Dayal, *Journal of Nanoscience and Nanotechnology*, Vol.9, 1–4, 2009.
2. Antimicrobial copper nickel bilayer and multilayer coatings by pulsed laser deposition on titanium, **Vinita Vishwakarma**, J.Theresa, R.P.George, R.Krishnan, S.Dash, M.Kamruddin, S.Kalavathi, N.Manoharan, A.K.Tyagi and R.K.Dayal, *Journal of Biofouling*, Vol. 25: 8, 705–710, 2009.
3. Safety and Risk Associated with Nanoparticles- A Review, **Vinita Vishwakarma**, Subhranshu Sekhar Samal and N. Manoharan, *Journal of Minerals & Materials Characterization & Engineering*, Vol. 9: 5,455-459, 2010.
4. Sonochemical Coating of Ag-TiO<sub>2</sub> Nanoparticles on Textile Fabrics for Stain Repellency and Self-Cleaning- The Indian Scenario: A Review, Subhranshu Sekhar Samal, P. Jeyaraman and **Vinita Vishwakarma**, *Journal of Minerals & Materials Characterization & Engineering*, Vol. 9: 6, pp.519-525, 2010.
5. Reducing biofouling of titanium surface by electroless deposition of antibacterial nano copper films, Josephine Therasa, **Vinita Vishwakarma**, R.P.George, M.Kamruddin, S.Kalavathi, N.Manoharan, A.K.Tyagi and R.K.Dayal, *Current science*, VOL. 99, NO. 8, 1079-1083, 2010.

## *International Conference:*

1. Lithium Carbonate Induced Mitotic Anomalies in *Vicia faba*, L Rashmi, **Vinita Vishwakarma**, Z.A. Haider and Anil Kumar, **New Research**, American Psychiatric Association, **May** 13-18, 2000 Chicago, IL, pp 11.

2. Predicting the Feasibility Analysis of Nanomedicine for Antituberculosis Compounds by Database, Data Mining, Modeling and Simulation", P.Sardar Maran, N Manoharan and **Vinita Vishwakarma**, International Conference on Nanotechnology, Coimbatore, June 23 – 25, 2006, Paper code:ICNT- 26.
3. Development of Asthma Drug Database- A Nanotechnology approach', Poongavanam Sardar Maran, **Vinita Vishwakarma** and N .Manoharan International Symposium on Computational Biology and Bioinformatics, Bhubaneshwar, India (ISBB-06), December 15-17, 2006, pp26.
4. Motivating A Girl Child Towards A Journey Through Science, Judy Gopal, **Vinita.V**, Rani P George and R. Sandhya, Sustaining Global Pressure for Women in Science and Engineering: (SGPW 2008) 3 – 5 Jan, 2008,p-48-51.
5. Antimicrobial copper nanothin films for biofouling control of titanium, **Vinita Vishwakarma**, N.Manoharan, R.P.George, S.Dash, M.Kamruddin, A.K.Tyagi and R.K Dayal, International Conference on Nano Science and Technology (ICONSAT), February 27-29, 2008, Chennai, India,pp B-142.
6. Surface modification of titanium by nano copper and copper-nickel alloy coatings to inhibit biofouling, **Vinita Vishwakarma**, J.Therasa, R.P.George, R.Krishnan, S.Dash, M.Kamruddin, S.Kalavathi, N.Manoharan, A.K.Tyagi and R.K.Dayal, Bangalore Nano 11-13 December 2008,P-061.
7. Surface modification of titanium condenser material to improve antimicrobial properties by nanotechnology, **Vinita Vishwakarma**, J.Therasa, R.P.George, R.Krishnan, S.Dash, M.Kamruddin, S.Kalavathi, N.Manoharan, A.K.Tyagi and R.K.Dayal, Surface Modification Technologies (SMT)-23,November 2-5, 2009,P-02.
8. Detailed Microbiological investigations on Biodeterioration of modified concretes in seawater environments, R.P. George, **Vinita Vishwakarma**, D. Ramachandran and U. Kamachi Mudali, Proceedings of East Asia & Pacific Area Corrosion Conference and Expo, CORCON 2011, 28<sup>th</sup> September to October 1<sup>st</sup>, Mumbai, India, R122.
9. Comparative study of surface modification of Titanium to improve antimicrobial properties in condenser material, **Vinita Vishwakarma**, Josephine Theresa, and A.K.Tyagi, ICONSET-2011, November,28-30<sup>th</sup>,2011,729-731.

10. Nanophase modification of concrete for Enhancement of microbial properties and durability: Present status and future scope, D.Ramachandran, **Vinita Vishwakarma** and S.S Samal, ICONSET-2011, November, 28-30<sup>th</sup>, 2011, 731-734.

### ***National Conference***

1. Effect of Chlor – alkali solid waster pollutant on paddy seed germination and its establishment. Chanchal Kr. Chowdhuary, Rashmi and **Vinita Vishwakarma**, National seminar on Socio-Economy Morbidity pattern, Demographical Changes and Cultural Heritage in Damodar Basin, 26- 27 Nov.1999, pp 223-228.
2. Lithium Carbonate induced sterility in *Vicia faba* L. Rashmi, **Vinita Vishwakarma**, Haider, Z.A. National symposium on plant diversity and Biotechnology, Department of Botany, Patna university, October 9-10, 2000, pp 34.
3. Polymers in Drug Delivery-A review, **Vinita Vishwakarma** and N. Manoharan, National Conference on Polymers for Advanced Technologies, Pune, Macro-2006, 17-20, December 2006.
4. Improving the antimicrobial properties of titanium condenser material by surface modification using nanotechnology, R.P.George, **Vinita Vishwakarma**, Josephine Theresa, N. Manoharan, S.Dash, R. Krishnan, M. Kamaruddin, S. Kalavathi, A.K.Tyagi and R.K. Dayal, OPENWAC-2008, Kalpakkam, 15-16 December, 2008, pp 144-147.
5. Biofouling control of condenser material by copper nanocoatings using pulsed laser deposition techniques, **Vinita Vishwakarma**, J. Theresa, R.P.George, R. Krishnan, S.Dash, M. Kamaruddin, N. Manoharan, A.K.Tyagi and R.K. Dayal, 11<sup>th</sup> Orissa Bigyan Congress, December 23 - 24, 2008, pp 110-115.
6. Antimicrobial effects of carbon nanotubes synthesized from soot, Subhranshu Shekar Samal and **Vinita Vishwakarma**, National Conference on Antimicrobial Resistance: From Emerging Threat to Reality, 23<sup>rd</sup> -25<sup>th</sup> March, 2009, Allahabad, ENV-08.
7. Effect of surface morphology for biofilm growth on titanium surface, J. Theresa, **Vinita Vishwakarma** R.P.George, R. Krishnan, S.Dash, M. Kamruddin, N. Manoharan, A.K.Tyagi and R.K. Dayal, National Conference on Antimicrobial

Resistance: From Emerging Threat to Reality, 23<sup>rd</sup> -25<sup>th</sup> March, 2009, Allahabad, ENV-013.

8. Investigations of microbiological aspects of Biodeterioration/biodegradation of concrete by sulphur oxidizing bacteria/fungi, RP George, **V Vishwakarma**, SS Samal and N. Manoharan, 12<sup>th</sup> Orissa Bigyan Congress, December 5 -6, 2009, pp 159.
9. Study of antibacterial effects of multiwalled carbon nanotubes synthesized by CVD method, Subhranshu Shekar Samal and **Vinita Vishwakarma**, National Conference on Interplay of Biological and Chemical Sciences (NCIBCS)-2010, Vellore, January 6-8, 2010, pp 107.
10. Eco-friendly concrete, D.Ramachandran, **Vinita Vishwakarma** and Subhranshu Sekhar Samal, National Conference on Trends in Renewable Energy Sources, Applications & Climate Change (TRESAC 2010), July 23<sup>rd</sup> -25<sup>th</sup>, 2010, pp 66.
11. Microbially induced deterioration of concrete, D.Ramachandran, **Vinita Vishwakarma**, Subhranshu Sekhar Samal, R.P.George, P.Muraleedharan and R.K.Dayal, National Conference on Trends in Renewable Energy Sources, Applications & Climate Change (TRESAC 2010), July 23<sup>rd</sup> -25<sup>th</sup>, 2010, pp 70.

### **BOOK PUBLISHED**

1. **Forest, Environment and Biodiversity**, M.P. Singh and **Vinita Vishwakarma**, Daya Publication, New Delhi, (1997) - ISBN 8170351707 (81-7035-170-7).
2. **Afforestation to improve rural Environment**, M.P. Singh, **Vinita Vishwakarma**, R.N. Trivedi, S.N. Singh and Azra Yasmin, Dimension of Safe environment, Anmole Publication, New Delhi, 1997, pp 257-264.
3. **Surface modification of titanium condenser material to improve antimicrobial properties by nanotechnology**, **Vinita Vishwakarma**, J. Theresa, R.P. George, R. Krishnan, S. Dash, M. Kamruddin, S. Kalavathi, N. Manoharan, A.K. Tyagi and R.K. Dayal, Surface Modification Technologies (SMT)-Proceedings, Vol, 23, pp. 427-432, ISBN 978-81-910570-0-2, Valardocs, 2010.

### **MEMBERSHIP**

1. Associate member, Indian Institute of Metals (IIM) –AS-40846

2. Life Member, Indian Women Scientist Association (IWSA), Kalpakkam Chapter, Chennai.

### **REVIEWER**

1. International Journal of Biomedical Nanoscience and Nanotechnology.
2. International Journal of Nutrition and Metabolism
3. Analyst
4. Journal of Materials Chemistry

**COMPUTER SKILL:** Diploma course in computer application, DTP, Tally 4.5, SYSTAT12

### **OTHER SKILLS:**

- Self motivation, perseverance, multitasking and management of People
- Critical thinking skills, writing and speaking skills, Research skills, networking skills
- Organizing National/International Conferences/workshops
- Leadership qualities
- Skills of maintaining accounts towards the purchase of materials and procurement of Instruments for the projects
- Maintaining stock book and log book for the purchased materials
- Knowledge of preparing Utilization Certification of the funded projects from various Agencies
- Panel member for the University Recruitment Board for the various post of R & D and Academics