

Varun Vyas

EMAIL ID - *varun.shiva@gmail.com*

DOB - October 20<sup>TH</sup> 1981

NATIONALITY-Indian

**AREA OF SPECIALIZATION** – Nanobiology, Surface & Materials  
Characterization using Atomic Force Microscopy and Optical Spectroscopy.

## Education

- **Ph.D. Medical Nanotechnology** – 2007-11 - European School of Molecular Medicine, University of Milan, Italy
- M.Sc. Biomedical Nanotechnology – 2005-06 - University Of Newcastle Upon Tyne, United Kingdom
- Post Graduate Diploma Bio-Chemical Technology – 2003-04- University of Delhi, India
- B.Sc. Biomedical Sciences-2000-03- University of Delhi, India

## Work Experience

- **Post-Doctoral Research Fellow** @ University of Connecticut (2011 till Present)
- Visiting Scientist At Jawaharlal Nehru University (JNU), Delhi, Sep-Nov 2011

## Teaching Experience

- Training of Grad Students in Microscopy and AFM @ Institute of Materials Sciences, UCONN.
- Lectures Delivered UCONN
  - “Nanoscience and its application in Medical Sciences”
  - “Introduction And Applications to Atomic Force Microscopy”.

## Fellowships and Awards

- 2009: Best Poster Award at IIT Guwahati at Advanced Nanomaterials and Nanotechnology (9-11 Dec. 2009)
- 2005: International Taught Programme Scholarship (ITPS) from University of Newcastle Upon Tyne

## Technical Skills

- **AFM Techniques** – AFM Imaging in tapping mode, contact mode, force spectroscopy, contact resonance, developing colloidal probe cantilevers & estimation of point of zero charge on nanostructured surfaces, estimation of surface roughness & related parameters, AFM tip functionalization, imaging eukaryotic & prokaryotic cells, high speed imaging, etc
- **Scanning Electron Microscopy/Surface Profilometry**

- **Soft lithography techniques** like Nanosphere lithography, Microcontact Printing etc.
- **Deposition Techniques** using Supersonic Cluster Beam Apparatus (**UHV** technology for depositing metal oxide nanoclusters), Physical Vapour Deposition (PVD).
- **Acoustic Microscopy** - Radio Frequency Actuation via Nanomechanical Resonators and Oscillators.
- Mass Spectroscopy - MALDI-TOF
- Surface Profilometry
- Confocal Microscopy
- **Analytical software** - Matlab , Ansys

## Conferences & Workshops

- ASME 2014 3rd Global Congress on NanoEngineering for Medicine and Biology (NEMB2014), Feb. 2-5, 2014 in San Francisco, CA.
  - Technical Presentation - Depth Dependent Nanomechanical Analysis on Monolayered Cells and Biopolymeric Surface.
  - Acted as Judge for the Poster Competition.
- Material Research Society (MRS) November 2012, Boston, USA
- TechConnect World, June 2012, California, USA
- Nanoscience and Nanotechnologies -Transalp' Nano 2010, 3-5 June, Como, Italy
- Advanced Nanomaterials and Nanotechnology - ICANN 2009, IITG, Dec 9-11, Guwahati, India

- Biological Single Molecule Research and Nanoscience - Winter School 2008  
Feb 12-14, Linz, Austria
- Biological Single Molecule Research and Nanoscience - Winter Workshop  
2008, Feb 15-18, Linz, Austria
- Nanoscience and Nanotechnologies -Transalp' Nano 2008, 27-29 October,  
Lyon, France

## **Thesis**

- **Ph.D. Thesis** - An Atomic Force Microscopy Investigation of Interfacial Properties of Biocompatible Nanostructured Metal Oxide Thin Films
- **M.Sc. Thesis** - Investigation of the Relationship between Mechanical and Electrical Properties of DNA Nanowires for Sensing Applications.(BioMEMS Designing)
- **B.Sc. Thesis** - Oligonucleotide and Nanoparticle Synthesis

## **Organizational Skills**

- Steering Committee Member in **Postdoctoral Association** of University of Connecticut.

## Publications

### Important Publications

- Dynamic and Depth Dependent Mechanical Properties of Membrane Ruffles in Live Cells and Biopolymeric Hydrogels ;**Varun Vyas**, Melani Solomon, Gerard GM D'Souza, Bryan Huey (Submitted)
- Nanoscale Mapping of In-Situ Actuating Micro Electro Mechanical Systems with AFM; *Rivas, Manuel; Vyas, Varun; Carter, Aliya; Veronick, James; Khan, Yusuf; Kolosov, Oleg V; Polcawich, Ronald G.; Huey, Bryan*, Journal of Materials Research,( 2014) (**Accepted**)
- Nano and Micro Scale Analysis of Dentin with in-vitro and High Speed Atomic Force Microscopy; *Yasemin Kutes, Varun Vyas & Bryan D. Huey*, Journal of Materials Research, 28, 2300-2307, (2013)
- Probing nanoscale interactions on biocompatible cluster-assembled Titanium Oxide surfaces by Atomic Force Microscopy; **Varun Vyas**, *Alessandro Podesta, Paolo Milani*; Journal of Nanoscience and Nanotechnology, 11 , 4667-4674 (2011)
- Nanoscale Roughness and Morphology Affect the IsoElectric Point of Titania Surfaces; *Borghini F, Vyas V, Podestà A, Milani P* , PLoS ONE 8(7), (2013)
- Quantitative Characterization of the Influence of the Nanoscale Morphology of Nanostructured Surfaces on Bacterial Adhesion and Biofilm Formation; *Ajay Vikram Singh, Varun Vyas, Rajendra Patil, Vimal Sharma, Pasquale Emanuele Scopelliti, Gero Bongiorno, Alessandro Podesta, Cristina Lenardi, Wasudev Namdev Gade, Paolo Milani*; PLoS ONE, Volume 6 , Issue 9 (2011)

- Biofilm formation on nanostructured titanium oxide surfaces and a micro/nanofabrication-based preventive strategy using colloidal lithography; AV Singh, V Vyas, TS Salve, D Cortelli, D Dellasega, A Podestà, P Milani, *Biofabrication* 4 (2), (2012)

### **In preparation and other published work**

- Nanomechanical Characteristics at Cell-Matrix Interface in 3D MultiCell Spheroidal Cultures; **Varun Vyas**, Melani Solomon, Gerard GM D'Souza, Bryan Huey (In Preparation)
- Directing the Mechanical Response of Micropatterned Cardiac Cells with Nano-scale Forces using AFM: Neerajha Nagarajan, **Varun Vyas**, Bryan D. Huey, Pinar Zorlutuna (In Preparation)
- Investigation of *in vitro* cytotoxicity of the redox state of ionic iron in neuroblastoma cells; Singh Ajay Vikram, **Vyas Varun**, Montani Erica, Cartelli Daniele, Parazzoli Dario, Oldani Amanda, Zeri Giulia, Orioli Elisa, Gemmati Donato, Zamboni Paolo; *Journal of Neuroscience in Rural Practice*, Vol. 3, Issue 3, 301-310 (2012)
- Rapid Prototyping of nano- and micro-patterned substrates for the control of PC12 cells neuritogenesis by topographic and chemical cues; Singh AV, Gailite L, **Vyas V**, Lenardi C, Forti S, Matteoli M, Milani P, *Journal of Material Science and Engineering c*; Vol 31, Issue 5, 892-899 (2011)
- Nanoengineering approaches to design advanced dental materials for clinical applications; A.V. Singh, S. Maheshwari, D. Giovanni, V.G. Naikmasur, A. Raj, Aditi VP, W.N.Gade, **V. Vyas**, D. Gemmati, G. Zeri, E. Orioli; *Journal of Bionanosciences*, Vol. 4, 1-13 (2010).

