

Curriculum Vitae
Of
Arun Kumar PhD

Faculty, College of Medicine, Department of Internal Medicine,
University of South Florida, Tampa, FL 33612

Research Interests:

Nano-technology, Targeted drug and biomolecules delivery, Biosensors, Functional nanomaterial, BioMEMS, Bio-Imaging and ultra sensitive detection of biomarkers, Synthesis of organic molecules and biomedical engineering and spectroscopy.

Formal Education:

Ph.D. (Chemistry-Spl. Biosensors) University of Delhi, Delhi, India, 2003

Thesis: Studies on the Immobilization of Some Enzymes and Their Applications to Biosensors.

M.Sc. (Chemistry-Organic) Rohilkhand University, India, 1989

C.F.Sc. (Forensic Science) University of Delhi, India, 1987

B.Sc. (Chemistry and Biology) University of Delhi, Delhi, India, 1986

Professional Positions:

July 2006- Till date-Faculty (Instructor) - Department of Internal Medicine, University of South Florida, Tampa, FL 33612-9220

Feb 2005- July 2006: Adjunct Faculty, Department of Internal Medicine, University of South Florida, Florida, FL, USA.

Jan 2004- Feb 2005: Research Assistant Professor- Nanomaterials and Nanomanufacturing Research Center, University of South Florida, FL, USA

2003Feb-2003Dec: Post Doc Fellow, SensoChip Lab, Department of Chemistry and Biochemistry, New Mexico State University, NM, USA

2000Nov-2000Dec: Visiting Scientist, Center for Molecular and Macromolecular Studies (CMMS), Lodz, Poland

1993-2003: Senior Scientific Assistant, Bimolecular Electronics and Conducting Polymer Research Group, National Physical Laboratory, (CSIR), New Delhi, India

1993Mar-1993Oct: Junior Scientific Assistant, Institute of Genomics and Integrative Biology (Formally CBT), Council of Scientific and Industrial Research (CSIR) Delhi, India

1990-1993Mar: Junior Scientific Assistant, Organic Chemistry Division-III, Indian Institute of Chemical Technology (IICT-CSIR), Council of Scientific and Industrial Research (CSIR), Hyderabad (AP), India.

Other positions

1. 2005-Till date as Co-chair- Diversity and equal opportunity (Asian Alliance of USF)

Honors, Awards, Fellowships

- i) Panelist: National Science Foundation (NSF) study section.
- ii) Regular Referee of international journals
- iii) Co-supervisor of Master and PhD students at USF (2004-till date)
- iv) Best teacher award from NSF IGRET program of USF in 2005
- v) Top Referee of the year 2006 award from Elsevier and Editor of Biosensor and Bioelectronics (International Journal of Biosensor).
- vi) Editorial board member of Sensors and Transducers international Journal since 2004
- vii) Technology Award 2007 (CSIR) Council of Scientific and Industrial Research (CSIR) New Delhi, India

Professional Consultant and Collaborator of Nanobiotech/nanotechnology Companies

1. **TransGenex Nanobiotech:** A USF spin out company located in Research Park involved in ultrasensitive diagnosis, rapid test kit and nanoparticles, 3820 Spectrum Blvd Tampa, FL 33612 USA
2. **Phthisis Diagnostics** is a Virginia-based molecular diagnostics company developing Infectious disease assays that are easy to use and cost-effective. 1400 West Main Street Charlottesville, VA 22905 USA

Certificates

1. Certificate in Bio-safety and Chemical Hazards from University of South Florida, Tampa 33620, USA (2004)
2. Certificate in Animal Uses, from University of South Florida, Internal Medicine, Tampa, USA, (2005)

Others

- i) Instruments used and operated for nanomaterial characterization like AFM, SEM, TEM, Mass Spectrometer, NMR, FTIR, UV visible, DSC, Gas chromatography, HPLC, X-ray Powder, Electrochemical Instruments, Diffractometer and Vacuum coatings instruments.

Teaching and Academic Research Experience

Co-supervisor and Committee member under graduate and graduate students at USF

PhD Thesis (Current students) (Nanotechnology/ biosensor)

1. Shyam Aravamudhan: BioMEMS Lab, College of Engineering, USF, Physical-Biological interactions in systems (Engg) (Indirect student) defended in **2007**.
2. Natalie Frey Huls: Surface and interface phenomena in magnetic nanostructures and thin films Functional Materials Laboratory, Physics Department USF, defended in **April 2008**.
- 3 Yvonne Davis: Microfluidic device for virus detection, Department of Internal Medicine, USF (**Current student**)

Previous student (Masters thesis)

1. Ophir Ortiz; Thesis: Effects of Changing Plating Variables on Morphology of Pd Nanostructures for hydrogen Sensing defended in **2004**.
2. Jessica Otto; Thesis: Development and Characterization of Carbon Nanotubes for Sensor Applications defended in **2005**.
3. Joythi Fernandez: The Use of Electrical Charge to Produce Cell-Cell Contact prior to Electrofusion, Dept. of Chemical Engg. Defended in **2005**

Previous REU student (Undergraduate) worked with me(2004-2005)

1. Brian Brantley: Nanocomposite material development and characterization for toxic gas sensing **(2005)**.
2. Tom Gressle: Modified Nanoparticle for sensor applications **(2005)**.
3. Graham Whitaker: Polyaniline coated carbon Electrode for Electrochemical Detection of Lipase**(2004)**.

International PhD Student completed nanotechnology projects with me

1. Vanesa Fal Miyar Department of Physics, University of Oviedo, 33007, Oviedo, Spain **(2007)**
2. Basu Nagrali from India worked on thin film for drug delivery **(2007)**

Class room teaching experience

1. Teaching BioMEMS classis to Masters and PhD students specifically Bio-engineered Interfaces and BioMEMS (NSF, IGERT program) at University of South Florida, Tampa, FL 33620, USA **(2004-2006)**
2. Teaching the Material characterization to engineering Master and PhD students at University of South Florida, Tampa, FL 33620, USA **(2004-2005)**

Refereed Journal Publications

1. A Novel Protocol to Entrap Active Urease in Tetraethoxysilane Derived Sol-Gel film by **Arun Kumar**, N. D. Kumar, M.N. Kamlahasnan, S. Chandra and B. D. Malhotra, U. Narang and Frank V. Bright; **Chem. Mater.**, Vol 6 **(1994)** 1596-1598.
2. Quantitative analysis of sugar mixture by infrared spectroscopy: Application to sugar industries by R Mehrotra, S. K. Dhawan, **Arun Kumar**, B. D. Malhotra, S. Chandra and J. J. Bhagat; **NPL Technical Bulletin**, India, Jan **(1995)**
3. Co-immobilization of Cholesterol Oxidase and horseradish Peroxidase in sol-gel film by **Arun Kumar**, Rajesh, S.K. Grover and B. D. Malhotra, **Analytica Chimica Acta**, Vol 414(1-2) **(2000)**, pp. 43-50.
4. Immobilization of Cholesterol Oxidase and Potassium Ferricyanide on Dodecylbenzene Sulphonate ion doped polypyrrole film by **Arun Kumar**, Rajesh, A. Chaubey, S.K. Grover and B. D. Malhotra; **J. Applied Polymer Science**, Vol 82 **(2001)**3486-3491.
5. Polymeric Microspheres with immobilized enzymes and other proteins as material for biosensor by S. Slomkowski, B. Miksa, T. Basinska, A. Gambhir, **Arun Kumar** and B.D.Malhotra; **Biocybernetics and Biomedical Engineering**, Vol.21,No 4, **(2001)** 49-65.
6. Covalent immobilization of urease to polypyrrole microspheres for application to urea biosensor by A. Gambhir, **Arun Kumar**, B. D. Malhotra, B. Miksa, S. Slomkowski, **(2002)**, **e- Polymers**, no052,
7. Immobilization of glucose oxidase onto electrochemically prepared Poly (aniline-cofluoroaniline) Films by, Amit L. Sharma, R. Singhal, **Arun Kumar**, Rajesh, K. K. Pande and B.D. Malhotra, **J.Applied Poly. Sci.**, Vol 91, **(2004)** 3999-4006.
8. Highly stable voltammetric detection of nitroaromatic explosives in the presence of organic surfactants at a polyphenol-coted carbon electrode by Joseph Wang, Sompong Thongngamdee and **Arun Kumar**; **Electroanalysis**, Vol 16, 15, **(2004)**.
9. Electro-deposit Polyaniline on Carbon Electrode for Voltametric Detection of Lipase by **Arun Kumar**, Graham Whitaker and Ashok Kumar, **Biosensors and Bioelectronics**, Vol. 21(3) pp 513-517, **(2005)**.

10. Effect of Interfacial Temperature on Tribological, Electrochemical and Surface Properties of Copper during CMP Process by S. Mudhivarthi, Parshuram. B. Zantye, **Arun. Kumar**, Ashok Kumar, Martin Beerbom, Rudy Schlaf; **Electrochemical and Solid-state letters**, 8(9) G241-G245, (2005).
11. Efficient DNA and peptide delivery by Functionalized Chitosan-coated Single Wall Carbon Nanotubes, **Arun Kumar**, Prasanna K. Jena, and Sumita Behera, Richard F. Lockey and Shyam Mohapatra, **Journal of Biomedical Nanotechnology**, vol1 No4 (2005) pp392-396.
12. Effect of Physical State of Carbon Nanocomposite on Hydrogen Adsorption and Desorption, **Arun Kumar**, Michael U. Jurczyk, Ashok Kumar, Elias Stefanakos **Mater. Res. Soc. Symp. Proc.** Vol. 884E, (2005)
13. Synthesis and Characterization of Nanocrystalline Diamond and Its Biomedical Application by Zhenqing Xu, **Arun Kumar**, Ashok Kumar, Arun Sikder; **Mater. Res.Soc. Symp. Proc.**Vol. 843, (2005) Materials Research Society.
14. Novel lactate and pH biosensor for skin and sweat analysis based on single walled carbon nanotubes, Jessica Weber, **Arun Kumar**, Ashok Kumar, Shekhar Bhansali, **Sensor and Actuators B**, (2005).B117,308-313..
15. Synthesis and characterization of nanoscale transition metal complex for hydrogen Storage **Arun Kumar**, Sessa S. Srinivasan, Matthew T. Smith, Deepak Deshpande, Eias K. Stefanakos, Yogi Goswami, Michael Jurczyk, Ashok Kumar, **Mater. Res.Soc. Symp. Proc.** Vol. 884E, (2005).
16. Amperometric detection of glucose using a modified nitrogen doped nanocrystalline diamond electrode, Zhenqing Xu, Ashok Kumar and **Arun Kumar**, **Journal of Biomedical Nanotechnology**, vol1, No 4 (2005) pp 416-420.
17. Tetraethylorthosilicate Film Modified with Protein to Fabricate Cholesterol Biosensor by **Arun Kumar** and Ravi Ranjan Pandey, **Talanta**, Vol.69,3,15 May 2006,700-705.
18. Development of Hyaluronic acid-Fe₂O₃ hybrid magnetic nanoparticles for targeted delivery of peptide, **Arun Kumar**, B. Sahoo, Alison Jones, Sumita Behera and Shyam S Mohapatra, **Nanomedicine: Nanotechnology, Biology and Medicine**,3 (2007) 132-137.
19. Ultra sensitive detection of cortisol with enzyme fragment complementation technology using functionalized nanowire **Arun. Kumar**, Milorad Gordic, Shekhar Bhansali and Shyam Mohapatra communicated to **Biosensor & Bioelectronics** (Elsevier UK) Volume 22, Issues 9-10, 15 April (2007), Pages 2138-2144
20. Sensitive Estimation of Total Cholesterol in Blood using a Nanowire- based Microfluidic Device, Shyam Aravamudhan, **Arun. Kumar**, Shyam Mohapatra and Shekhar Bhansali, **Biosensor & Bioelectronics** (Elsevier UK) Biosensors and Bioelectronics 22 (2007) 2289–2294
21. Analysis of Mesocavity DNA Biochip for Respiratory Syncytial Virus (RSV) Diagnosis, Zekri, Souheil; **Kumar, Arun**; Singh, Shree R.; Kumar, Ashok, **Journal of Biomedical Nanotechnology**, Volume 3, Number 2, June (2007) pp. 139-147(9).
22. Magneto impedance biosensor for Fe₃O₄ nanoparticles intracellular uptake evaluation, **Arun Kumar**, V. Fal-Miyar, J. A. García and A. Cerdeira, S.Mohapatra, H. Srikanth, G. V. Kurlyandskaya, **Applied Physics Letters** 91, 143902 2007
23. Natriuretic peptide receptor A as a novel anticancer target Xiaoyuan Kong, Xiaoqin Wang, Weidong Xu, Sumita Behera, Gary Hellermann, **Arun Kumar**, Richard F Lockey, Subhra Mohapatra, and Shyam S Mohapatra, **Cancer Research** 68: (1). January 1, 2008.
24. Multifunctional Magnetic Nanoparticles for Targeted Delivery of Drug **Arun Kumar**, P. K. Jena, Sumita Behera, Richard F. Lockey and Shyam S Mohapatra **Nanomedicine** (Communicated).2008

Manuscript under preparation

25. Novel nanotech approach for Oxidative Stress Biomarkers Detection in exhaled Breath, **Arun Kumar**, Yvonne Davis, Dawn Vo , S Bhansali, and Richard F Lockey, Shyam S Mohapatra (In the process of submitting)
26. Targeted Delivery to Lung Using Extra-testicular Sertoli cells, **Arun Kumar**, Yvonne Davis, Dawn Vo, Edward Haller, Leslie Patrick, Jane Woodrow, Richard F Lockey, S. Mohapatra and Don F. Cameron (In the process of submission)
27. Functionalized micro fluidic device for RSV detection, **Arun Kumar**, Yvonne Davis, Dawn Vo, S Bhansali ,Richard F Lockey, S. Mohapatra (In the process of submission)

International Conference Presentations:

1. Multifunctional Magnetic Nanoparticles for Targeted Delivery of Drug, **Arun Kumar *Invited Speaker*** R F Lockey and Shyam S Mohapatra international conference on **Advanced Nanomaterial (ANM-2008)**, June 23rd -28th **Aveiro, Portugal**.
2. Multifunctional Magnetic Nanoparticles for Cancer Cell Targeting and their Localization at Specific Sites, **Arun Kumar**, P.K.Jena, R F Lockey and Shyam S Mohapatra, (***Invited Speaker***).**Cancer Nanotech 2007** 26-28, Jun, **Paris France**,
3. Multifunctional nanoparticles for specific cell targeting and their commercialization Shawna Shirley, **Arun Kumar**, R F Lockey and Shyam S Mohapatra, **11th Annual International Conference of Micro and Nano Systems Conference**, St.Petersburg, Florida on August 27-31, **2006 (COMS 2006) USA**.
4. LDL Antibody-containing Magnetic Particles for Cholesterol Reduction **Arun Kumar** and Shyam S Mohapatra **NanoBiotech World Congress**,16-17 November 2006, Boston, MA. **USA**
5. Ultra sensitive detection of cortisol with enzyme fragment complementation technology using functionalized nanowire **Arun. Kumar**, Milorad Gordic, Shekhar Bhansali and Shyam S Mohapatra (***Invited Speaker***) **BIOSENSOR 2006**, May 10-12 ,Sheraton Center **Toronto, CANADA**
6. Sensitive Estimation of Total Cholesterol in Blood using a Nanowire- based Microfluidic Device, Shyam Aravamudhan, **Arun. Kumar**, Shyam Mohapatra and Shekhar Bhansali, **BIOSENSOR 2006**, May 10-12 ,Sheraton Center Toronto, **CANADA**
7. Hybrid nanoparticles of polymers and magnetite for organ-specific drug delivery, **Arun Kumar**, B. Sahoo, Alison Jones, Sumita Behera, Richard F Lockey and Shyam S Mohapatra, **PITTCON 2006**, March 12-17, Orange County Convention Center, West Bldg., Orlando, FL, **USA**
8. Nanostructured membrane for implantable Nanobiosensors. **Arun Kumar**, Bio Nano Material, Nanotech **2005**, 2005 **NSTI Nanotechnology Conference and Trade Show** May 8-12, 2005 Anaheim, California, **U.S.A.**
9. Efficient DNA and peptide delivery by Functionalized Chitosan-coated Single Wall Carbon Nanotubes, Shyam Mohapatra, **Arun Kumar**, Prasanna K. Jena, , Richard F. Lockey and Sumita Behera **Controlled Release Society, 2005** annual Meeting, June 18-22, **2005**, Miami, Florida, **USA**
10. Semi-solid material for hydrogen storage, **Arun Kumar**, Michael Jurczyk, Ashok Kumar, Elias Stefanakos, **Florida Chapter of the AVS Science and Technology Society (FLAVS)** held on Monday, Tuesday and Wednesday, March 14, 15 and 16, **2005** at the University of Central Florida Orlando, Florida, **USA**.
11. Nanocrystalline Diamond Thin Film for Biosensor Applications Zhenqing Xu, **Arun Kumar** and Ashok Kumar accepted to present in **2005 TMS ANNUAL MEETING & EXHIBITION USA**

12. Nitrogen-doped nanocrystalline diamond films modified with conductive polymer for DNA hybridization analysis, Zhenqing Xu, **Arun Kumar** and Ashok Kumar, presented in **MRS Spring 2005**, San Francisco, **USA**
13. Novel Nanoscale Biosensor for Lactate Analysis in Sweat, **Arun Kumar**, Jessica Otto, Ashok Kumar, and Shekhar Bhansali, presented in **MRS Spring 2005**, San Francisco, **USA**
14. Simultaneous Detection of Insulin, Glucose and pH Using Nanosensor Array, Souheil Zekri, **Arun Kumar** and Ashok Kumar, presented in **MRS Spring 2005**, San Francisco, **USA**
15. Nanocomposite with Carbon Nanotubes Aligned in High Magnetic field for Hydrogen Storage Applications, Michael U Jurczyk, **Arun Kumar**, Ashok Kumar, Lee Stefanakos, Sessa S. Srinivasan, presented in **MRS Spring 2005**, San Francisco, **USA**
16. Nanoscale electronic nose for Co and SO₂ detection, **Arun Kumar**, Brian Brantley and Ashok Kumar, presented in **MRS Spring 2005**, San Francisco, **USA**.
17. Nanobiosensor for Cholesterol Detection, **Arun Kumar**, Thomas Gressle and Ashok Kumar, presented in **MRS Spring 2005**, San Francisco, **USA**
18. Nanoscale DNA Biosensor for Respiratory Syncytial Virus (RSV) Diagnosis, **Arun Kumar**, Souheil Zekri, Shree R Singh and Ashok Kumar, presented in **MRS Spring 2005**, San Francisco, **USA**.
19. Effect of Physical State of Carbon Nanocomposite on Hydrogen Adsorption and Desorption, Michael U Jurczyk, **Arun Kumar**, Ashok Kumar, Lee Stefanakos, Sessa S. Srinivasan, presented in **MRS Spring 2005**, San Francisco, **USA**
20. Chemical Mechanical Planarization Challenges in Integration of Low Dielectric Constant Materials, Parshuram B. Zantye, Ashok Kumar and **Arun Kumar**, presented in **MRS Spring 2005**, San Francisco, **USA**
21. Effect of Temperature on the Chemical Mechanical Polishing (CMP) Slurry Abrasive Particle Agglomeration and Defectivity, S. Mudhivarthi, Parshuram B. Zantye, **Arun Kumar**, Ashok Kumar, , Jeung-Yeop Shim and E. Turos, presented in **MRS Spring 2005**, San Francisco, **USA**
22. A Study of the effect of Slurry temperature on Cu Chemical Mechanical Polishing (CMP) with H₂O₂ and KIO₃ as Oxidizing Agents, Raghu Mudhivarthi, Parshuram B. Zantye, **Arun Kumar** and Ashok Kumar, presented in **MRS Spring 2005**, San Francisco, **USA**
23. Solid state gas sensor for ammonia detection based on Polyaniline multi-walled carbon nanotubes and TiO₂ Brian Brantley, Souheil .Zekri, **Arun Kumar** and Ashok Kumar, 2004 **Annual Joint Symposium March 8-9 2004 University of Central Florida Orlando, Florida, USA**
24. Sol-gel and carbon nanotubes based microelectrode for simultaneous detection of glucose and insulin Thomas Gressle, Souheil Zekri, **Arun Kumar** and Ashok Kumar, 2004 **Annual Joint Symposium March 8-9 2004 University of Central Florida Orlando, Florida, USA**.
25. Nanoscale Silicon Microcavity Biosensor ; **Arun Kumar**, Souheil Zekri, Shree R Singh and Ashok Kumar DNA Biosensors, **The 1st International Conference on Nanotechnology (Nanotech 2004)**, 13-17 July Meritus Mandarin, **Singapore, 2004**.
26. Polyaniline Coated Carbon Electrode for Electrochemical Detection of Lipase, **Arun Kumar**, Graham Whitaker and Ashok Kumar, *REU, Conference*, at USF, **2004**, USA.
27. Ion Selective Electrode for Skin Secretions Analysis, **Arun Kumar**, Jessica Otto, Ashok Kumar and Shekhar Bahansali **SPIE International Symposium on Smart Materials, Nano- and Micro-Smart Systems** will be held 12-15 December **2004** at the University of New South Wales in **Sydney, Australia**.
28. Polymeric Carbon Nanocomposites for Hydrogen Storage **Arun Kumar**, Michael U. Jurczyk, Ashok Kumar, Sessa S. Srinivasan and Lee Stefanakos submitted to **MRS Fall 2004 Conference**, November 29 - December 3, **2004**, Boston, MA, **USA**.
29. Conducting Polymeric Nanocomposite for Ammonia Gas Sensor Applications **Arun Kumar**, Brian Brantley, Souheil Zekri and Ashok Kumar accepted to present in **MRS Fall 2004**

- Conference**, November 29 - December 3, 2004, Boston, MA, **USA**.
30. DNA Immobilized on Porous Silicon for Hybridization Analysis, **Arun Kumar**, Souheil Zekri, Shree R Singh and Ashok Kumar accepted in ***SPIE International Symposium on Smart Materials, Nano and Micro-Smart Systems*** will be held 12-15 December 2004 at the University of New South Wales in **Sydney, Australia**.
 31. Synthesis and characterization of nanocrystalline diamond film and its biomedical applications, Z. Xu, **Arun Kumar**, A. K. Sikder and Ashok Kumar, accepted to present in ***MRS Fall 2004 Conference***. November 29 - December 3, 2004, Boston, MA, **USA**.
 32. Co-immobilization of L-lactate dehydrogenase and NADH to magnetic particle Fe₃O₄ by **Arun Kumar**, S. K. Dhawan and R. P. Pant presented in ***International Workshop on Recent Advances in Nanotechnology of Magnetic Fluids***, 22-23 Jan. 2003, National Physical Laboratory New Delhi, **India**.
 33. Immobilization of cholesterol oxidase onto Fe₃O₄ magnetic particle by covalent linkage by **Arun Kumar**, R.R.Pandey, R.P.Pant, S.K.Dhawan presented in International Workshop on ***Recent Advances in Nanotechnology of magnetic Fluids, 22-23 Jan. 2003***, National Physical Laboratory, New Delhi 110012, **India**.
 34. Direct coupling of urease to ferromagnetic particle using [1-(3- dimethylamino) propyl]-3-ethyl carbodimide hydrochloride by **Arun Kumar**, R.R.Pandey, S.K.Dhawan, R.P.Pant and K.K.Saini presented in ***International Workshop on Recent Advances in Nanotechnology of magnetic Fluids, 22-23 Jan. 2003***, National Physical Laboratory, New Delhi 110012, **India**.
 35. Electrochemically co-deposition of of cholesterol oxidase and horseradish peroxidase to acrolin/ polypyrrole microspheres by **Arun Kumar**, R.R.Pandey, K.K.Saini and B.D.Malhotra Presented in Indian Japan workshop on ***New Advanced Materials in Molecular Electronics***, National Physical Laboratory, New Delhi, **India**, December 10-11(2001).
 36. Covalent coupling of cholesterol oxidase to bovine serum albumin coated sol-gel film by **Arun Kumar**, R.R Pandey, K.K, Saini and B.D.Malhotra in ***Conference on Biotechnology-the Science & Business partner country France*** in Indian Institute of Technology (IIT), New Delhi, **India**, September 28-30 (2001).
 37. Electronics principle of metabolic sensors by **Arun Kumar**, K.K.Saini, Chanderkant, R.R.Pandey, M.K.Pandey and B.D.Malhotra in ***Indian Japan workshop on New Advanced Materials in Molecular Electronics***, National Physical Laboratory, New Delhi, **India**, December 10-11(2001).
 38. Covalently immobilization and characterization of urease onto Indium tin oxide coated glass plate by **Arun Kumar**, K.K.Saini and B.D.Malhotra presented in Indian Japan workshop on ***New Advanced Materials in Molecular Electronics***, National Physical Laboratory, New Delhi, **India**,, December 10-11 (2001).
 39. Potentiometric urea biosensor based on urease covalently attached to polypyrrole microspheres by **Arun Kumar**, A Ghambhir, B.Miksa, S.Slomkowski and B.D.Malhotra presented in ***New Horizons in Biotechnology***, Trivandrum, **India** (2001)
 40. Electrochemical deposition of covalently linked urease with polyaniline microspheres and its characterization by **Arun Kumar**, R. R. Pandey, K.K.Saini, and B.D.Malhotra paper presented in National Symposium on ***Ancient Indian science, Engineering and Technology Interfaced with Modern Knowledge***, held at Indian Agricultural Institute (IARI) Pusa campus, New Delhi, India. December 14-15 (2001).
 41. Covalent coupling of cholesterol oxidase to sol- gel derived TEOS film by **Arun Kumar**, R.R.Pandey, K.K.Saini and B.D.Malhotra presented in Indian Japan workshop on ***New Advanced Materials in Molecular Electronics***, National Physical Laboratory, New Delhi, **India**, December 10-11(2001).
 42. Immobilization of cholesterol oxidase and potassium fericyanide on dodecylbenzene sulphonate ion doped polypyrrole film by **Arun Kumar**, Rajesh, A. Chaubey, S.K.Grover and

- B.D.Malhotra presented in **World Polymer Conference IUPAC Macro Warsaw, Poland July (2000)**.
43. Co-immobilization of cholesterol oxidase and horseradish peroxidase in TEOS derived film by **Arun Kumar**, Rajesh, S.K Grover and B.D.Malhotra presented in **National Symposium on Biomolecular Electronics interfacing Physics and Chemistry with Biology September 16-17,National Physical Laboratory, New Delhi, India (1999)**.
44. Polyaniline based urea biosensor by **Arun Kumar**, H.Vardhan and B.D.Malhotra presented in **Royal Chemical Society (UK) London in September (1995)**.

Book Chapter(s)

- (i) Diagnostics applications of enzyme doped sol-gel derived glasses by **Arun Kumar**, M.N. Kamalasanan, M. Singh, P. Chauhan and B. D. Malhotra in the book entitled **Advances in Biosensors**, Vol 5, (2003), pp 71-95, Elsevier Sciences (UK).

Manuscripts

Analytica Chimica Acta
Biocybernetics and Biomedical Engineering
Biosensors and Bioelectronics
Chemistry of Material
e-Polymers
Electroanalysis
J. Applied Polymer Science
Talanta
Sensor and Actuators B
Journal of Biomedical Nanotechnology
Nanomedicine
Cancer Research

Patents in US and India

(A) Patents field in Indian patent office India

- 1 Novel sol gel based enzyme electrode useful for estimation of cholesterol in aqueous medium, **Arun Kumar et.al**, NF-NO 0312NF2002/IN, Application No 0652DEL2002, Filing Date, 17.6.2002.
- 2.A process for the preparation of novel sol gel based enzyme electrode useful for the estimation of cholesterol in aqueous medium, **Arun Kumar et.al** 0313NF2002/IN, 0654DEL2002,17/06/2002

(B) Patents [World Intellectual Property Organization] (WIPO) PCT (Patent Cooperation Treaty)

3. Enzyme electrode and process for preparation thereof, IB02/05684, 31/12/2002 **Arun Kumar et.al (Patent No WO2004/058994 A1)**.
4. A novel sol gel based cholesterol enzyme electrode, IB02/05680, 31/12/2002, **Arun Kumar et.al (Patent No WO2004/059310 A1)**

(C) US Patents

5. Polymer based enzyme electrode for estimation of cholesterol and process for preparation thereof, 0445NF2002/US 10/277,089, USA, 22/10/2002. United States Patent Application,20040074772, Kind Code A1, **Kumar, Arun; et al**, April 22, 2004 **(Patent No US 7,175,746 B2)**

6. Enzyme electrode and process for preparation thereof, 10/345,163, 16/01/2003 United States Patent , Kind Code: A1, **Kumar, Arun; et al.** 2004. **United States Patent 20040149577**).
- 7 DNA Biochip and Methods of Use. **Arun Kumar**, Ashok Kumar, Souheil Zekri and Shree R Singh (**United States Patent 20070015175**)

Patent Disclosures submitted at USF patent office

8. Carbon Based Nanocomposite Material for hydrogen storage **Arun Kumar**, Michael Jurczyk, Ashok Kumar and Elias K. Stefanakos. Patent disclosure submitted on 12/10/2004 to USF patent office, Tampa, USA **2004**,
9. Novel Nanoparticles Based CMP Slurry for Cu Planarization, **Arun Kumar**, Parshuram. B. Zantye, Ashok Kumar, Patent disclosure submitted on to USF patent office on 03/22/2005, Tampa, USA, **2005**
10. Novel Nanoparticle Based CMP Slurry for Polymeric Interlayer Dielectric Planarization. **Arun Kumar**, Parshuram. B. Zantye, Ashok Kumar, Patent disclosure submitted to USF patent office on 03/22/2005, Tampa, USA 2005.
11. Development of novel NP-73-102 HA nanoparticle for targeting melanoma, **Arun Kumar et.al**, Patent disclosure submitted to USF patent office on 04/11/2005, Tampa, USA 2005.
12. Novel Non invasive Nano RF device for Transdermal drug delivery, **Arun Kumar** and Shyam Mohapatra. Patent disclosure submitted to USF patent office on 04/11/2005, Tampa, USA, 2005.
13. Chitosan-f-SWCNT-DNA nanocomplex for DNA deliver into cells by **Arun Kumar** and Shyam Mohapatra; Patent disclosure submitted to USF patent office June 15 **2005** Tampa, Florida, USA
14. Materials and Methods for reduction of Low density lipoprotein cholesterol by **Arun Kumar** and Shyam S Mohapatra disclosed on April 14, **2006** to USF patent office, Tampa, Florida USA
15. Material and methods of ultra sensitive detection of cortisol by **Arun Kumar** and Shyam S Mohapatra disclosed at USF patent office on April 21, **2007** Tampa, Florida, USA.
16. Rapid Test for HIV by **Arun Kumar**, Wilson Xu and Shyam Mohapatra disclosure submitted In Jan **2008** to patent Attorney Fowler and White Tampa ,FL33602 USA
- 17 Targeted delivery of drug to Lung; **Arun Kumar**, Shyam S Mohapatra and Don Cameron disclosure submitted on 21 FEB **2008** to USF patent office, USA

Professional Affiliations

1. Member of the Society for Electroanalytical Chemistry, USA
2. Professional Member of the Institute of Nanotechnology, Scotland, UK
3. Member of Material Research Society (MRS) (USA)
4. American Chemical Society (USA) (Regular Member)
5. IUPAC Affiliate Member
6. Nanotechnology in Cancer Teaming, National Cancer Institute
7. Member of AAAAI (American Academy of Allergy Asthma and Immunology)

Team member in technology commercialization:

Commercialized the technology for Glucometer for diabetic patients and the technology have been transferred from National Physical Laboratory to following companies in India:

1. Palsatum Health care Pvt. Ltd. Bangalore, India.
2. Gamma Instrumentation, Faridabad, Haryana, India

3. Transgenix, Ahmedabad, (Gujarat), India.

Invited lectures

1. Center for Biochemical Technology, Mall Road, Delhi University Campus. **Delhi, India, (1993).**
2. Biotechnology Department, Punjab University, Patiala, Punjab, **(1998), India.**
3. Center for molecular and Macromolecular Studies, **Lodz, Poland. (2000).**
4. Central Instrumentation Organization, Chandigarh, **(2002) India.**
5. International Workshop on Recent Advances in Nanotechnology of Magnetic Fluids, National Physical Laboratory, New Delhi, **India on 22-23 Jan, 2003.**
6. Alabama State University, Montgomery, **AL, USA** Biology Department, 27 Feb **2004.**
7. **Nano and Micro-Smart Systems** at the University of New South Wales in **Sydney, Australia.** 12-15 December **2004**
9. Nanoscale material for biomedical and sensor applications, Florida Chapter of the AVS Science and Technology Society (FLAVS) will be held on March 14-16, **2005** at University of Central Florida, **Orlando, Florida, USA.**
10. Invited talk on engineered nanoparticles for biomedical applications organized by **Royal chemical Society LONDON at University of Delhi India** on 13Feb **2006**
11. Ultra sensitive detection of cortisol with enzyme fragment complementation technology using functionalized nanowire Arun. Kumar, Milorad Gordic, Shekhar Bhansali and Shyam Mohapatra **BIOSENSOR 2006**, May 10-12, Sheraton Center **Toronto, CANADA**
12. Advances in nanotechnology: Biomedical Application Dec 8 **2006, Tampa, FL USA**
13. Multifunctional Magnetic Nanoparticles for Cancer Cell Targeting and their Localization at Specific Sites, **Cancer Nanotech 2007** 26-28, Jun, **Paris, France.**
14. Multifunctional Magnetic Nanoparticles for Targeted Delivery of Drug **Arun Kumar** International conference on **Advanced Nanomaterial (ANM-2008)**, June 23rd -28th **Aveiro Portugal (2008)**

International conference organizing committee's member

1. National Symposium on Biomolecular Electronics Interfacing Physics and Chemistry with Biology held at National Physical Laboratory, New Delhi India, 16-17 September **1999.**
2. Indian-Japan workshop on New and Advance Materials in Molecular Electronics held at National Physical Laboratory, New Delhi on December 10-11 **2001.**
3. International Workshop on Recent Advances in Nanotechnology of Magnetic Fluids held at National Physical Laboratory, New Delhi India, 22-24 Jan. **2003**

International Journal's Referee

- Biosensors and Bioelectronics (Elsevier, UK)
- Analytica Chimica Acta (Elsevier, UK)
- Journal of Current and Applied Physics.
- IEE Proc. Nanobiotechnology
- Talanta
- Sensors and Transducers (Editorial Board member)

Co-investigator of funded projects in India and US:

1. Synthesis and characterization of conducting polymer **Indo-US project** (DST/INT/USIF-404/93) **Arun Kumar et.al.**

2. Conducting polymers **Contract grant sponsor: CSIR. Arun Kumar et.al.**
3. Conducting polymer application in bio-molecular electronics **Indo-Japanese project** (Sponsored by DST/JSPS); contract grant number: INT/JAP/JSPS/NM- M-7/2000. **Arun Kumar et.al**
4. **Indo-Polish project** on conducting polymer micro spheres for enzyme immobilization contract grant number:INT/POL/P015/2000,.**Arun Kumar et.al.**
5. **DST Project**; contract on sensor Technology grant number:SP/S2/M-52/96. **Arun Kumar et.al.**
6. Sensor Technology Development **Contract grant sponsor: DBT Project**; contract grant Number: BT/PR1926/PID/24 / 74/2000 **Arun Kumar et.al.**
7. **Sensor, ONR** (Award N00014-01-1-0213) and **MIPT** (Project 2002-J-A-139) USA, 2003, **Arun Kumar et.al.**

ACTIVE RESEARCH SUPPORT (ARUN KUMAR PhD)

- 1 Foundation Grant (**co-investigator**) 2007-2008
James and Esther King Biomedical Research Program
Person Month Effort: 6 calendar months (Cost: \$1.3 M)
Engineered Nanoparticles for Biomarker Detection and Targeted Drug Delivery of Cancers.
2. USF SPAID grant (**PI**) 2008-2009
Person Month Effort: 6 calendar months (Cost \$25000)
Ultra Sensitive Detection of Oxidant Stress Biomarker in Exhaled Breath

COMPLETED FUNDED PROJECTS

1. US department of Energy Co-PI) 2004-2005
(DEO DE-FG36- 04G014224)
Person Month Effort: 12 calendar months (Cost: \$60,000)
Carbon Based Material for Hydrogen storage,
2. USF Internal Grant (**co-investigator**) 2005-2006
Person Month Effort: 6 calendar months (Cost: \$30,000)
"Transdermal delivery of drug using RF (Radio frequency)