

Comprehensive Professional Vitae of
Ramaswamy Nagarajan

Department: **Plastics Engineering**
College: **James B. Francis College of Engineering**
Rank: **Assistant Professor**
Field: **Plastics, Elastomers and Additives from Renewable Resources,
Sustainable Routes to Advanced Functional Materials,
Sensors for Explosives and Structural Health Monitoring**

Date of Appointment: **2nd October 2006**

A. EDUCATION AND ACADEMIC QUALIFICATIONS

1. Education

Doctorate in Polymer Science (Plastics Engineering option) Fall 2000
University of Massachusetts, Lowell, MA
Dissertation Supervisor: Sukant K. Tripathy
Title: Enzymatic synthesis of Polyaniline complexed with DNA and
other polyelectrolyte templates

Masters of Science in Polymer Science Fall 1998
University of Massachusetts, Lowell, MA

Bachelor of Technology (Concentration: Rubber Technology) Summer 1994
Anna University, Chennai, India

Bachelor of Science (Concentration: Chemistry) Summer 1991
Loyola College, University of Madras, Chennai, India

2. Academic Experience

Assistant Professor, Department of Plastics Engineering 2006 -Present
University of Massachusetts, Lowell, MA

Adjunct Faculty, Department of Physics 2003-2005
University of Massachusetts, Lowell, MA

Post-Doctoral Research Associate, Departments of Physics 2001-2003
Center for Advanced Materials,
University of Massachusetts, Lowell, MA

Research Assistant, Department of Chemistry 1997-2000
University of Massachusetts, Lowell, MA

Teaching Assistant, Department of Chemistry 1995-1997
University of Massachusetts, Lowell, MA

B. PROFESSIONAL ACTIVITIES

1. Professional Association Participation

a. Membership in Professional Societies

- Society of Plastics Engineers (Member since 1998)
- Sigma Xi -The Scientific Research Society (Membership by nomination only - 2001)
- American Chemical Society (Member since 1998)
- Materials Research Society (Member since 1998)

b. Journal Editor

- Guest editor for Issue 12, Volume 47 of 'Journal of Macromolecular Science, Part A: Pure and Applied Chemistry' (2010) ; ISSN: 1060-1325 print / 1520-5738 online

c. Journal Referee

- Biomacromolecules (2 papers reviewed: Jan 2010 and June 2009)
- Catalysis Science and Technology (1 paper reviewed in Dec 2010)
- Journal of Cleaner Production (1 paper reviewed in Sept 2010)
- Journal of Macromolecular Science, Part A Pure and Applied Chemistry (2 papers: May 2010, and June 2009)
- Journal of Polymers and Environment (4 papers reviewed: May 2011, Aug 2010, Nov 2008, Aug 2008)
- Macromolecules (2 papers reviewed: Sept. 2007 and Dec. 2006)

d. Proposal Panel Reviewer

NSF panel reviewer

- May 2011: "Materials processing and manufacturing proposals" review panel, Washington D.C.
- Nov 2010: "Materials processing and manufacturing proposals" (by e-mail)
- June 2010: "Environmental Sustainability Unsolicited proposal"(by e-mail)
- June 2009: "Environmental Sustainability Unsolicited proposal" review panel, Washington D.C.
- May 2009: "Catalysis and Biocatalysis Unsolicited Proposals" review panel, Washington D.C.

American Chemical Society – Green Chemistry Institute reviewer

- August 2007: Reviewer of 5 research proposals in 2007

2. Professional Awards and Honors

Toxics Use Reduction Institute - UML Research Champion of the Year award Summer 2011

Citations from State Senator Eileen Donoghue and Representative James Arciero Summer 2011

U.S Environmental Protection Agency P3 (People, Prosperity and the Planet) award for "Non-halogenated flame retardant materials" Spring 2011

James V. Dandeneau Endowed Professorship – in recognition of service to research and education in ‘Sustainable Polymers and Additives’	Fall 2009
U.S Environmental Protection Agency P3 (People, Prosperity and the Planet) award for “Biocatalytic Polymerization of Naturally Occurring Green Tea Flavonoids for Cancer Therapy”	Spring 2006
Mark J. Elliot Outstanding Student Award for Polymer Science research , University of Massachusetts, Lowell, MA.	Summer 2000
Special award for paper “Hysteresis – An experimental set-up for laboratory studies” presented at Indian Institute of Technology, Kharaghpur, India.	Spring 1994

3. Non-teaching activities (Consulting and other professionally related work)

a. Consulting: Served as a consultant in the area of “Flexible Electronics” for FLEXcon company, Spencer, MA Summer and Fall 2010

b. Industrial interaction leading to sponsored research and commercialization

<i>CertainTeed Corporation:</i> funded project on “Utilization of Recycled Polyolefin and Polyester Feed Streams”	2010- present
<i>Avery Dennison:</i> “Development of printable metallic inks for RFID applications”	2009 - 2010
<i>Konarka Technologies Inc.:</i> funded project on “Organic Photovoltaics from Nano-patterned Fullerenes and Semi-conducting Polymers”	2008 - present
<i>Triton Systems Inc.:</i> funded project on “Development and Characterization of Chemical and Biological Warfare Agent-Resistant Garments”	2008 - 2009
<i>Linden Photonics Inc.,:</i> funded project on “characterization of liquid crystalline polymers.”	2007- present
<i>Rockwell Automation:</i> funded project on “Low Cost and Low Stress Lens Molding (LCLS) Project”	2007- 2008
<i>Preddeter Inc.:</i> funded project on “Development of Polymeric Composites for Sustained Release of Animal Repellants”	2008-2009
<i>Linden Photonics Inc.,:</i> exploring the use of liquid crystalline polymers for optoelectronic packaging applications.	2003 – 2005

C. RESEARCH

1. Grants and Contracts

a. External Grants

EXTERNAL GRANTS OBTAINED AS PRINCIPAL INVESTIGATOR

<i>Year Funded</i>	<i>Project Title, Principal Investigators, Funding Agency</i>
2011	Novel Greener Routes to Halogen-free Flame Retardant Materials; P.I – R. Nagarajan , Co-PI – Sethumadhavan Ravichandran; U.S Environmental Protection Agency – Phase - II
2010	Novel Greener Routes to Halogen-free Flame Retardant Materials; P.I – R. Nagarajan , Co-PI – Sethumadhavan Ravichandran; U.S Environmental Protection Agency – Phase - I
2010	Nanostructured Sensing Elements for Structural Health Surveillance – Year –IV; P.I. – R. Nagarajan , Co-P.I. - J. Mead, C. Niezrecki, A. Akyurtlu, P. Avitabile, J. Chen ; Army Research Labs and CHN
2010	Development of Novel Flame Retardant Materials that operate through Synergistic Mechanisms; P.I. – R. Nagarajan , Co- P.I. - J. Kumar; U.S Army Natick (First installment - \$82,829 received)
2009	Nanostructured Sensing Elements for Structural Health Surveillance – Year –III; P.I. – R. Nagarajan , Co-P.I. - J. Mead, C. Niezrecki, A. Akyurtlu, P. Avitabile, J. Chen ; Army Research Labs and CHN
2008	Organic Photovoltaics from Nano-patterned Fullerenes and Semi-conducting Polymers; P.I. – R. Nagarajan , Co-P.I. - J. Mead; Konarka Technologies Inc.
2008	Nanostructured Sensing Elements for Structural Health Surveillance - Year-II; P.I. – R. Nagarajan , Co-P.I. - J. Mead, C. Niezrecki, A. Akyurtlu, P. Avitabile, J. Chen; Army Research Labs and CHN
2008	Development of Polymeric Composites for Sustained Release of Animal Repellants; P.I. – R. Nagarajan; Preddeter Inc.
2007	Low Cost and Low Stress Lens Molding (LCLS) Project ; P.I. – R. Nagarajan , Co-P.I. D. Kazmer; Rockwell Automation
2007 & 2009	Nanostructured Sensing Elements for Structural Health Surveillance – Year I and Year II; P.I. – R. Nagarajan , Co-P. I. - J. Mead, C. Niezrecki, A. Akyurtlu, P. Avitabile, J. Chen Army Research Labs and CHN

EXTERNAL GRANTS OBTAINED AS CO- PRINCIPAL INVESTIGATOR

<i>Year funded</i>	<i>Project Title, Principal Investigators, Funding Agency</i>
2011	Investigation of the Quality Control of Compatibilized UPVC; P.I - Stephen Driscoll, Co-PI – R. Nagarajan; Certainteed Corporation
2010	Utilization of Recycled Polyolefin and Polyester feed Streams ; P.I. - Stephen Driscoll, Co-PI – R. Nagarajan, Co-PI Robert Malloy; Certainteed Corporation
2010	A Hybrid Electronic Tongue for Geo-environmental Site Characterization P.I. - P. Kurup ; Co-P.I. - R. Nagarajan; National Science Foundation
2008	TGA, DSC, Flammability Characterization of LCP Resin; P.I. - J. Kumar, Co-P.I. – R. Nagarajan; Linden Photonics
2008	Development and Characterization of Chemical and Biological Warfare Agent-Resistant Garments; P.I. - J. Kumar, Co-P.I. – R. Nagarajan ; Triton Systems Inc.
2007	High Precision Detection and Prediction of Explosives Based on Multiple Sensing Systems and Data Fusion; P.I. - P. Kurup, Co-P.I. - J. Kumar, Z. Gu, H. Sun, R. Nagarajan ; National Science Foundation

PENDING GRANT

<i>Year funded</i>	<i>Project Title, Principal Investigators, Funding Agency</i>
2011	Biobased Plastics for a Sustainable Future: Undergraduate Educational Modules for the Engineering Curricula, PI – Bridgette Budhlall, Co-PI R. Nagarajan, C. Barry; National Science Foundation

b. Internal grants

INTERNAL GRANTS OBTAINED AS PRINCIPAL INVESTIGATOR

<i>Year funded</i>	<i>Project Title, Principal Investigators, Funding Agency</i>
2011	Polysaccharide Based Surfactants as Alternatives to Nonylphenol Ethoxylates in Laundry Detergents PI – R. Nagarajan, Co-PI Ryan Bouldin Toxics Use Reduction Institute, Lowell, MA.
2011	Binder-free Silver Inks for Electrode Materials in Organic Photovoltaics PI – R. Nagarajan, Massachusetts Technology Collaborative (Seed funding from CHN/NCOE)

2010	A New Class of Halogen-Free “Greener” Flame Retardant Materials PI – R. Nagarajan , co-PI J. Kumar CVIP Technology Development Fund, UMass President’s Office
2010	Polysaccharide Based Emulsifiers for the Replacement of Nonylphenol Ethoxylate PI – R. Nagarajan , Co-PI Ryan Bouldin Toxics Use Reduction Institute, Lowell, MA.
2009	Novel Low-Temperature Processable Metallic Inks for Flexible Electronics and RF Applications PI – R. Nagarajan CVIP Technology Development Fund, UMass President’s Office
2009	Sustainable Routes to Processable Non-Halogenated Flame Retardants PI – R. Nagarajan , Co- PI J. Kumar Toxics Use Reduction Institute, Lowell, MA.
2008	Halogen-free flame retardants and antioxidants derived from naturally occurring materials P.I. – R. Nagarajan , Co-P.I. - J. Kumar Toxics Use Reduction Institute, Lowell, MA.
2007	Greener-routes to Halogen-free Flame retardants P.I. - J. Kumar, Co-P.I. – R. Nagarajan Toxics Use Reduction Institute. Lowell, MA
2007	Novel In-situ Synthesis of Semi-conducting polymers for Solar Cell Applications P.I. - J. Kumar, Co-P.I. – R. Nagarajan CFCI, University of Massachusetts Lowell

2. Academic Publications

a. Peer – reviewed (Refereed) Journal Papers (21 papers published since 2006)

41. “Facile synthesis and patterning of silver nanoparticles for surface plasmon generation” (A. Kokil, A. Kumar, S. Balasubramaniam, R. Nagarajan, J. Kumar) *Journal of Nanophotonics*, 5. (2011).
40. “Synthesis of polypyrrole with fewer structural defects using enzyme catalysis” (R. Bouldin, S. Ravichandran, A. Kokil, R. Garhwal, S. Nagarajan, J. Kumar, F. F. Bruno, L. A. Samuelson, R. Nagarajan), *Synthetic Metals*, 161, 1611-1617 (2011).
39. “Detection of Explosive Vapors by Surface Acoustic Wave Sensors Containing Novel Siloxane Based Coatings” (S. Liu, T. Ponrathnam, H. Sun, R. Nagarajan, J. Kumar, Z. Gu, P. Kurup.) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, 47(12), 1172-1175, (2010).
38. “Enzymatic Synthesis and Characterization of PolyQuercetin” (F. F. Bruno, A. Trotta, S. Fossey, S. Nagarajan, R. Nagarajan, L. A. Samuelson, J. Kumar) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry* 47(12), 1191-1196, (2010).
37. “A Renewable Waste Material for the Synthesis of a Novel Non-Halogenated Flame Retardant Polymer” (S. Ravichandran, R. Bouldin, J. Kumar, R. Nagarajan), *Journal of Cleaner Production*, 19(5), 454-458, (2010).*
36. “Soybean Peroxidase Catalyzed Enzymatic Synthesis of Pyrrole/EDOT Copolymers”

- (A. Tewari, A. Kokil, S. Ravichandran, S. Nagarajan, R. Bouldin, L. A. Samuelson, R. Nagarajan, J. Kumar) *Macromolecular Chemistry and Physics*, 211(14), 1610-1617, (2010).*
35. "Dynamic chemical vapor sensing with nanofibrous film based surface acoustic wave sensors" (S. Liu, H. Sun, R. Nagarajan, J. Kumar, Z. Gu, J. Cho, P. Kurup), *Sensors and Actuators, A: Physical*, A167(1), 8-13, (2011).
 34. "A stable biomimetic redox catalyst obtained by the enzyme catalyzed amidation of iron porphyrin" (S. Nagarajan, R. Nagarajan, F. Bruno, L. A. Samuelson, J. Kumar), *Green Chemistry*, 11, 334 – 338, (2009).
 33. "Patterning Flexible Substrates Using Surface Relief Structures in Azobenzene Functionalized Polymer Films" (S. Yang, K. Yang, A. Jain, R. Nagarajan, J. Kumar), *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, 45(11), 939-942, (2008).
 32. "Biocatalytically oligomerized epicatechin with potent and specific anti-proliferative activity for human breast cancer cells" (S. Nagarajan, R. Nagarajan, S. J. Braunhut, F. F. Bruno, D. McIntosh, L. Samuelson, J. Kumar), *Molecules*, 13(11), 2704-16 (2008).
 31. "Biocatalytic Modification of Naturally Occurring Iron Porphyrin" (S. Nagarajan, R. Nagarajan, R. Tyagi, J. Kumar, F. F. Bruno, L. A. Samuelson), *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, 45(11), 952-957, (2008).
 30. "Biocatalytically Synthesized Poly(3,4-ethylenedioxythiophene)" (S. Nagarajan, J. Kumar, F. F. Bruno, L. A. Samuelson, R. Nagarajan), *Macromolecules*, 41(9), 3049-3052, (2008).*
 29. "A Simple Technique for Submicron Scale Patterning of Silver Using Visible Light Interference" (A. Kumar, Abhishek; S. Nagarajan, K. Yang, A. Robinson, J. Singh, R. Nagarajan, A. Jain, J. Kumar) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, 45(11), 964-967, (2008).
 28. "Study of Thin Polymeric Film Deposited by the PECVD Process for use at 193 nm" (M. Cazeca, R. Nagarajan, M. -S. Sheu, M. Gow, C. Comptois, R. W. Sabnis, A. Farnsworth) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, 44(12), 1317-1322, (2007).
 27. "In situ polymerization of amphiphilic diacetylene for hole transport in solid state dye-sensitized solar cells" (Y. Wang, K. Yang, X. Wang, R. Nagarajan, L. Samuelson, J. Kumar) *Organic Electronics*, 7(6), 546-550, (2006).
 26. "Spectroscopic and Microscopic Analysis of Photocrosslinked Vinylbenzylthymine Copolymers for Photoresist Applications" (S. Trakhtenberg, J. C. Warner, R. Nagarajan, Ramaswamy, F.F. Bruno, L. A. Samuelson, J. Kumar), *Chemistry of Materials*, 18(12), 2873-2878, (2006).
 25. "In situ polymerized carboxylated diacetylene as a hole conductor in solid-state dye-sensitized solar cells" (Y. Wang, K. Yang, S.-C. Kim, R. Nagarajan, L. A. Samuelson, J. Kumar) *Chemistry of Materials*, 18(18), 4215-4217, (2006).
 24. "Hydrophobic barrier: Molecular self-assembly of amphiphilic polyacetylenes within aluminosilicate nano platelets" (D. W. Kim, B.-C. Ku, D. Steeves, R. Nagarajan, A. Blumstein, J. Kumar, P. W. Gibson, J. A. Ratto, L. A. Samuelson), *Journal of Membrane Science*, 275(1-2), 12-16 (2006).
 23. "Synthesis of main-chain liquid-crystalline polyesters containing diphenyl mesogens by

- chemo-enzymatic route” (L. Niu, Langang, R. Nagarajan, D. Feng, L. Samuelson, J. Kumar) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, 43(12), 1983-1990, (2006).
22. “Biocatalytic synthesis of multi-block copolymer composed of poly(tetrahydrofuran) and poly(ethylene oxide).” (L. Niu, R. Nagarajan, F. Guan, L. A. Samuelson, J. Kumar), *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, 43(12), 1975-1981, (2006).
 21. “Biomimetic Synthesis of Water-Soluble Conducting Copolymers/Homopolymers of Pyrrole and 3,4-Ethylenedioxythiophene” (F. F. Bruno, S. A. Fossey, S. Nagarajan, R. Nagarajan, J. Kumar, L. A. Samuelson), *Biomacromolecules*, 7(2), 586-589, (2006).
 20. “Nanostructured assembly of homopolymers for a flexible Bragg grating” (M. Kim, R. Nagarajan, J. H. Snook, L. A. Samuelson, J. Kumar), *Advanced Materials* 17(5), 631-633 (2005).
 19. “Biocatalytic synthesis of novel electronic and photovoltaic materials” (R. Mosurkal, R. Kumar, F. F. Bruno, R. Nagarajan, L. Samuelson, J. Kumar), *Pure and Applied Chemistry*, 77(1), 263-272 (2005).
 18. “Poly[bis-(p-toluene sulphonate) of 2,4-Hexadiyne-1,6-diol] Langmuir-Blodgett thin film formation and characterization” (X. Wang, D. Sandman, F. F. Bruno, R. Nagarajan) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry* A42(11), 1555-1560 (2005).
 17. “An Enzymatically Synthesized Polyaniline: A Solid-State NMR Study” (S. K. Sahoo, R. Nagarajan, S. Roy, L. A. Samuelson, J. Kumar, A. L. Cholli), *Macromolecules* 37(11), 4130-4138 (2004).
 16. “Patterning of substrates using surface relief structures on an azobenzene-functionalized polymer film” (S. Yang, K. Yang, L. Niu, R. Nagarajan, S. Bian, A. K. Jain and J. Kumar), *Advanced Materials*, 16 (8), 693-696 (2004).
 15. “Role of temperature in suppression of the formation of Pummerer's type ketone in enzymatic polymerization of 4-Propylphenol: An in-Situ Variable Temperature ¹H NMR Study” (S. Sahoo, X. Wu, W. Liu, R. Nagarajan, J. Kumar, L. A. Samuelson and A. L. Cholli), *Macromolecules*, 37(6), 2322-2324 (2004).
 14. “Enzymatic and biomimetic synthesis of electroactive polymers and their optical and electronic properties” (J. Kumar, W. Liu, S. Roy, R. Nagarajan, S. K. Tripathy, F.F. Bruno and L. Samuelson), *International Journal of Plastics Technology*, 6(1), 32-36 (2003).
 13. “Biomimetic synthesis of water soluble conductive polypyrrole and poly (3,4-Ethylenedioxythiophene)” (F. F. Bruno, R. Nagarajan, S. Roy, J. Kumar and L. A. Samuelson) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, A40 (12), 1327-1333 (2003).
 12. “Variation in the structure of conducting polyaniline with and without the presence of template during enzymatic polymerization: a solid-state NMR study” (S. K. Sahoo, R. Nagarajan, S. Chakraborty, L. A. Samuelson, J. Kumar and A.L. Cholli) *Journal of Macromolecular Science, Part A: Pure & Applied Chemistry*, A39 (10), 1223-1240 (2002).
 11. “Novel enzymatic polyethylene oxide-polyphenol system for ionic conductivity” (F. F. Bruno, R. Nagarajan, J. Kumar and L. A. Samuelson) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, A39 (10), 1061-1068 (2002).
 10. “Biomimetic synthesis of a water soluble conducting molecular complex of polyaniline and lignosulfonate” (S. Roy, J. M. Fortier, R. Nagarajan, S. K. Tripathy, J. Kumar, L.

- Samuelson and F.F. Bruno), *Biomacromolecules*, 3(5), 937-941 (2002).
9. "Enzymatic synthesis of molecular complexes of polyaniline with DNA and synthetic oligonucleotides: Thermal and Morphological Characterization" (R. Nagarajan, S. Roy, J. Kumar, S. K. Tripathy, T. Dolukhanyan, C. Sung, F. Bruno and L. Samuelson), *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, (12), 1519-1537 (2001).*
 8. "Enzymatically synthesized polyaniline in the presence of a template poly(vinylphosphonic acid): a solid state NMR study" (S. Sahoo, R. Nagarajan, L. Samuelson, J. Kumar, A. L. Cholli and S.K. Tripathy), *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, A38 (12), 1315-1328 (2001).
 7. "Polymerization of water-soluble conductive polyphenol using Horseradish peroxidase" (F. F. Bruno, R. Nagarajan, P. Stenhouse, K. Yang, J. Kumar, S. K. Tripathy and L. A. Samuelson) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, A38 (12), 1519-1537 (2001).
 6. Chemoenzymatic functionalization of ribonucleic Acids with azobenzene chromophores (S. Roy, R. Nagarajan, P. Wu, K. Yang, F. F. Bruno, V. S. Parmar, S. K. Tripathy, J. Kumar and L. A. Samuelson) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, A38 (12), 1383-1392 (2001).
 5. "Peroxidase, hematin and pegylated hematin catalyzed vinyl polymerizations in water" (A. Singh, S. Roy, L. Samuelson, F. Bruno, R. Nagarajan, J. Kumar, V. John, and D. Kaplan) *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, A38 (12), 1219-1230 (2001).
 4. "Manipulating DNA conformation using intertwined conducting polymer chains" (R. Nagarajan, W. Liu, S. K. Tripathy, J. Kumar, F. F. Bruno and L. A. Samuelson), *Macromolecules*, 34, 3921-3927 (2001).*
 3. "Nanoreactors for the enzymatic synthesis of conducting polyaniline" (L. Samuelson, W. Liu, R. Nagarajan, J. Kumar, F. F. Bruno, A. Cholli and S. Tripathy), *Synthetic Metals*, 119, 271-272 (2001).
 2. "Enzymatic Synthesis of electrically conducting molecular complex of polyaniline and Poly (Vinyl phosphonic Acid)" (R. Nagarajan, S. K. Tripathy, J. Kumar, F. F. Bruno and L. A. Samuelson) *Macromolecules*, 33, 9542-9547 (2000).*
 1. "The role of template in the enzymatic synthesis of conducting polyaniline" (W. Liu, A.L. Cholli, R. Nagarajan, J. Kumar, S.K. Tripathy, F. F. Bruno and L. Samuelson), *Journal of the American Chemical Society*, 121 (49), 11345-11355 (1999).

b. Peer – reviewed (Refereed) Journal Papers in Press

4. "Biocatalytic Synthesis of Two photon Active Resveratrol Oligomer" (S. Satapathi, S. Ravichandran, R. Mosurkal, S. Nagarajan, L. Li, R. Bouldin, S. Tripathy, F. Bruno, R. Nagarajan, L.A. Samuelson, J. Kumar), *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry* (2011) **Accepted for publication June 2011.**
3. "Investigation of QCM sensors with azobenzene functionalized coatings for the detection of nitroaromatics" (T. Ponrathnam, J. Cho, P. Kurup, J. Kumar, R. Nagarajan), *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry* (2011), **Accepted for publication June 2011.***
2. "Oxidoreductase catalyzed polymerization of 3-methylpyrrole" (R. Bouldin, L. Kyriazidis, A. Fidler, S. Ravichandran, J. Kumar, L. Samuelson, R. Nagarajan) *Journal of Macromolecular Science Part A: Pure and Applied Chemistry* (2011), **Accepted for publication June 2011.***

1. “Horseradish peroxidase catalyzed polymerization of cardanol microcapsules” (A. Kokil, S. Ravichandran, J. Kumar, R. Nagarajan) *Journal of Macromolecular Science Part A: Pure and Applied Chemistry* (2011), **Accepted for publication June 2011.***

* First Author or Corresponding Author

c. Book /Book Chapters

Published

1. “Enzymatic Synthesis of Electrically Conducting Polymers” (R. Bouldin, A. Kokil, S. Ravichandran, S. Nagarajan, J. Kumar, F. F. Bruno, L. A. Samuelson, R. Nagarajan) *Green Polymer Chemistry: Biocatalysis and Biopolymers*; ACS Symposium Series 1043; Cheng, H. N.; Gross, R. A.; Eds.; ACS, Washington, 315-341, (2010).
2. “Metalloporphyrin based Biomimetic Catalysts for Materials Synthesis and Biosensing” (S. Nagarajan, F.F. Bruno, L. Samuelson, J. Kumar, R. Nagarajan), *Biomaterials*, ACS Symposium Series 1054; A. Kulshrestha, A. Mahapatro, L. A. Henderson , ACS, Washington, Chapter 12, 221–242 (2010).

In preparation

Fall 2009 –Present: Authoring a book on “Polymers from renewable resources – Structure Property and Applications”. Proposed date for delivery of the manuscript to the Publisher (Scrivener Publishing) is April 2012.

d. Conference Proceedings and Symposium Papers (Total of 21 since 2006)

21. “Enzymatic synthesis of polysaccharide-based biosurfactants”, (Z. Mohd Aris, R. Bouldin, B. Budhlall, R. Nagarajan) 15th Annual Green Chemistry & Engineering Conference and 5th International Conference on Green & Sustainable Chemistry, Washington DC, United States (2011).
20. “Novel ‘Greener’ Routes to Halogen-Free Flame Retardants”, (S. Ravichandran, R. Bouldin, J. Kumar, R. Nagarajan), EPA People Prosperity and Planet Design Expo, Washington DC, United States (2011).
19. “Surface-Active Polymer Derived from Naturally Occurring Polysaccharides”, (Z. Mohd Aris, R. Bouldin, R. Nagarajan), American Chemical Society, Cellulose Division, Anaheim, CA, United States (2011).
18. “Novel roll-to-roll manufacturable strain sensor for remote structural health monitoring”, (S. Sivasubramanian, M.J. Cazeca, S. Balasubramaniam, J. R. Park, J. Mead, J. Chen, C. Niezrecki, P. Avitabile, A. Akyurtlu, R. Nagarajan), Proceedings of MRS fall meeting Symposium D, Boston MA, United States (2010).
17. “Soluble pegylated polythiophenes: Synthesis and nitroaromatic sensing” (A. Kokil, T. Ponrathnam, A. Kumar, R. Nagarajan, J. Kumar) Abstracts of Papers, ACS National Meeting, Boston, MA, United States (2010).
16. “Azobenzene functionalized poly(dimethyl siloxane) coatings for explosive detection using a surface acoustic wave device” (T. Ponrathnam, S. Liu, A. Kokil, J. Cho, H. Sun, R. Nagarajan, J. Kumar, P. Kurup) Abstracts of Papers, 240th ACS National Meeting, Boston, MA, United States (2010).

15. "Biocatalytically polymerized flavonoids with enhanced antioxidant activity" (D. Kalyani, S. Tripathy, S. Nagarajan, R. Nagarajan, F.F. Bruno, L.A. Samuelson, J. Kumar) Abstracts of Papers, 240th ACS National Meeting, Boston, MA, United States (2010).
14. "Naturally derived surface active polymers based on Chitosan", (R. Bouldin, S. Shingi, R. Nagarajan), Abstracts of Papers, 240th ACS National Meeting, Boston, MA, United States (2010).
13. "Biomimetic hematin catalyst for the synthesis of conductive polypyrrole in micellar nanoreactors" (S. Ravichandran, A. Kokil, S. Nagarajan, J. Kumar, R. Nagarajan) Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) 51(2), 656-657, (2010).
12. "Soybean Peroxidase Catalyzed Enzymatic Synthesis of Soluble Pyrrole/EDOT Copolymers" (A. Tewari, A. Kokil, S. Ravichandran, S. Nagarajan, R. Bouldin, F.F. Bruno, L.A. Samuelson, R. Nagarajan, J. Kumar), Abstracts, 36th Northeast Regional Meeting of the American Chemical Society, Hartford, CT, United States, October 7-10 NERM-021 (2009).
11. "Enzymatic synthesis of polycardanol microcapsules" (A. Kokil, S. Ravichandran, R. Nagarajan, J. Kumar) Abstracts of Papers, 238th ACS National Meeting, Washington, DC, United States, August 16-20, COLL 169 (2009).
10. "Enzymatic synthesis of water soluble polypyrrole", (R. Bouldin, S. Ravichandran, R. Garhwal, S. Nagarajan, J. Kumar, F.F. Bruno, L. A. Samuelson, R. Nagarajan), Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 50(2), (2009).
9. "Flame retardant materials from oxidative polymerization of naturally derived cashew nut shell liquid (CNSL) derivatives" (S. Ravichandran, R. Bouldin, S. Nagarajan, J. Kumar, R. Nagarajan), PMSE Preprints, 101, 1634-1635, (2009).
8. "Novel Wireless Sensors for Structural Health Surveillance" (S. Balasubramaniam, J.R. Park, A. Akyurtlu, C. Niezrecki, P. Avitabile, J. Chen, J. Mead, R. Nagarajan), Proceedings of the 7th International Workshop on Structural Health monitoring, Destech Publication Inc. 935 (2009).
7. "Conformal Passive Sensors for Wireless Structural Health Monitoring" (S. Balasubramaniam, J.-R. Park, T. Mistry, N. Angkawisittpan, A. Akyurtlu, T. Rao, R. Nagarajan) Proceedings of MRS fall meeting Symposium V, (2008).
6. "Biocatalysis for material science and drug discoveries" (F. F. Bruno, L. A. Samuelson, S. Nagarajan, R. Nagarajan, J. Kumar) From Materials Research Society Symposium Proceedings (2008).
5. "Biomimetic synthesis of water soluble conducting copolymers" (F. F. Bruno, S. A. Fossey, S. Nagarajan, R. Nagarajan, J. Kumar, L. A. Samuelson), Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 48(2), 9-10 (2007).
4. "A stable biomimetic redox catalyst obtained by enzyme catalyzed amidation of iron porphyrin" (S. Nagarajan, R. Nagarajan, F. F. Bruno, L. A. Samuelson, J. Kumar), Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) 48(2), 879-880 (2007).
3. "A novel template for the formation of water-soluble conducting polymers" (F.F. Bruno, S. Nagarajan, R. Nagarajan, J. Kumar, L. A. Samuelson), Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 48(2), 80-81 (2007).
2. "Biocatalytic modification of naturally occurring Iron porphyrin as a renewable catalyst" (S. Nagarajan, R. Tyagi, R. Nagarajan, J. Kumar, A.C. Watterson, F. F.

Bruno, L. A. Samuelson), Abstracts of Papers, 233rd ACS National Meeting, Chicago, IL, United States, March 25-29, (2007).

1. "Single step biocatalytic synthesis of sexithiophene" (S. Nagarajan, R. Nagarajan, M.Cazeca, J. Kumar, F.F.Bruno, L. A. Samuelson, Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 47(2), 1043-1044 (2006).

Conference Proceedings and Symposium Papers (Before 2006)

15. "Thiophene oligomer as a 'redox mediator' for the biocatalytic synthesis of Poly (3, 4-Ethylenedioxythiophene) [Pedot]" (R. Nagarajan, F. F. Bruno, L. A. Samuelson and J. Kumar), Polymer Preprints (ACS, Division of Polymer Chemistry) 45 (2), 195-196 (2004).
14. "Conductive polymer complexes from macromolecule inspired biocatalysis" (F.F. Bruno, C. Drew, R. Nagarajan, X. Wang, J. Kumar and L. A. Samuelson), Proceeding of the ACS, Division of PMSE, 90, 234-235 (2004).
13. "Biomimetic synthesis of water soluble conductive polypyrrole and poly (3,4-ethylenedioxythiophene)" (F. F. Bruno, J. M. Fortier, R. Nagarajan, S. Roy, J. Kumar and L. A. Samuelson), MRS Proceedings, 736 (Electronics on Unconventional Substrates--Electrotextiles and Giant-Area Flexible Circuits), 201-206 (2002).
12. "Synthesis of polyaniline on multi-walled carbon nanotubes" (F. F. Bruno, L. Samuelson, S. Roy, R. Nagarajan, J. Kumar, D. Ziegler and M. Sennett) Polymer Preprints (ACS, Division of Polymer Chemistry) 43(2), 961-962 (2002).
11. "Novel templated polyphenol for ionic conductivity" (F.F. Bruno, R. Nagarajan, J. Kumar and L.A. Samuelson) Materials Research Society Symposium Proceedings (Advanced Fibers, Plastics, Laminates and Composites), 702, 229-234 (2002).
10. "Synthesis of a photoactive-azopolymer complexed with genomic DNA" (R. Nagarajan, S. Yang, S. Roy, J. Kumar, S.K. Tripathy, F. F. Bruno and L. A. Samuelson), Polymer Preprints (ACS, Division of Polymer Chemistry) 43(2), 959-960 (2002).
9. "Influence of template and enzyme on biocatalytic synthesis of conducting polyaniline as studied by solid-state NMR spectroscopy" (S. Sahoo, R. Nagarajan, S. Roy, L. Samuelson, J. Kumar and A. Cholli) Proceeding of the ACS, Division of PMSE (86), 15 (2002).
8. "Challenges in micro-thermal detection of energetic materials" (C. Chen; C. Kuo, R. Nagarajan, W. Bannister and J. Furry), Proceeding of the NATAS conference (2002).
7. "Use of hematin for the polymerization of water-soluble conductive polyaniline and polyphenol" (F. F. Bruno, R. Nagarajan, S. Roy, J. Kumar, S. K. Tripathy and L. Samuelson), MRS Proceedings 660, (Organic Electronic and Photonic Materials and Devices) (2001).
6. "Enzyme catalyzed chromophore functionalization of ribonucleic acid" (S. Roy, R. Nagarajan, S. Yang, P. Wu, J. Kumar, L. Samuelson, F. F. Bruno, V. S. Parmar and S. K. Tripathy) Proceeding of the ACS, Division of PMSE, 455 (2001).
5. "DNA conformation switching using a templated conducting polymer" (R. Nagarajan, S. K. Tripathy, J. Kumar, F. F. Bruno and L. A. Samuelson), Proceeding of the ACS, Division of PMSE, 83, 546-547 (2000).
4. "Biochemical synthesis of water soluble conducting molecular complex of polyaniline and lignosulfonate" (F. F. Bruno, L. Samuelson, R. Nagarajan, J. Kumar and S. K. Tripathy), Polymer Preprints, 41 (2), 1802-1803 (2000).

3. "Enzymatic template synthesis of processable polyphenol" (F. F. Bruno, R. Nagarajan, J. S. Sidhartha, K. Yang, J. Kumar, S. K. Tripathy and L. Samuelson), Proceeding of the SPE, 58th ANTEC, (2), 2336-2340 (2000).
2. "Biochemical synthesis and unusual conformational switching in a molecular complex of DNA and polyaniline" (R. Nagarajan, J. Kumar, S. K. Tripathy, F. F. Bruno and L. Samuelson) MRS Proceedings, 600, 249-254 (1999).
1. "Enzymatic template synthesis of polyphenol" (F. F. Bruno, L. A. Samuelson, R. Nagarajan, S. K. Tripathy and J. Kumar) MRS proceedings, 600, 255-259 (1999).

e. Patents (Total 14 issued, 10 issued since 2006)

(i) Patents Issued

- 14-11. "Assembled hematin, method for forming same and method for polymerizing aromatic monomers using same" F.F. Bruno; Ferdinando, L. Samuelson, R. Nagarajan, J. Kumar, M. Sennett, U.S Patent Number: 7,510,739 (2009); 7,358,327 (2008); 7,344,751 (2008); 7,022,420 (2006).
10. "Polymerization of aromatic monomers using derivatives of hematin" (S. Tripathy, L. A. Samuelson, F. F. Bruno, S. Roy, R. Nagarajan, J. Kumar, B, -C. Ku; S, - H, Lee) U.S. Patent Number: 7,479,329 (2009).
9. "Enzymatic polymerization" L. A. Samuelson, F. F. Bruno, S. Tripathy, W. Liu, R. Nagarajan, J. Kumar, U.S Patent Number: 7,332,297 (2008).
8. "Polymerization of aromatic monomers using derivatives of hematin" (S. Tripathy, L. A. Samuelson, F. F. Bruno, S. Roy, R. Nagarajan, J. Kumar, B, -C. Ku; S, - H, Lee) U.S Patent Number: 7,294,686 (2007).
7. "Polymer-template complex produced by enzymatic polymerization" L. A. Samuelson, F. F. Bruno, S. Tripathy, W. Liu, R. Nagarajan, J. Kumar, U.S Patent Number: 7,309,582 (2007).
- 6-4. "Methods for polymerization of electronic and photonic polymers" F.F. Bruno. L. A. Samuelson, R. Nagarajan and J. Kumar U.S Patent Number: 7,230,071 (2007); 7,186,791 (2007); 7,186,792 (2007).
3. "Method of forming an electrically conductive connection utilizing a polynucleotide/conductive polymer complex" L. A. Samuelson, F.F. Bruno, S.K. Tripathy, R. Nagarajan, J. Kumar and W. Liu U.S. Patent No: 7,056,675 (2006).
2. "Enzymatic template polymerization" L. Samuelson, F. F. Bruno; S. K. Tripathy, R. Nagarajan, J. Kumar, W. Liu, U.S Patent Number 7,001,996 (2006).
1. "Enzymatic polymerization of anilines or phenols around a template" L. A. Samuelson; S. K. Tripathy; F. F. Bruno; R. Nagarajan; J. Kumar; W. Liu, U.S Patent Number 6,569,651 (2003).

(ii) Patents Pending (19 total, 3 Filed in or after 2006)

19. "Wireless Passive Radio-Frequency Strain And Displacement Sensors" Ramaswamy Nagarajan, Sharavanan Balasubramanian, Mario Cazeca, Shivshankar Sivasubramanian, Joey Mead and Julie Chen, International Patent - WO/2011/066028 (2011).
18. "Conductive formulations for deposition of binder-free metallic elements suitable for use in electrical, electronic and RF applications" Ramaswamy Nagarajan, Sharavanan Balasubramanian, Joey Mead and Julie Chen, - International Patent - WO/2010/065503 (2010).

17. "Synthesis of oligo/poly(catechins) and methods of use" F. F. Bruno, J. Kumar, S. Nagarajan, S. J. Braunhut, R. Nagarajan; L. A. Samuelson, D. McIntosh, K. Foley U.S 20090170928 A1 (2009) International Application No: PCT/US2006/015872 (2006).
- 16–13. "Polymerization of aromatic monomers using derivatives of hematin" S. K. Tripathy, L. A. Samuelson, F. F. Bruno, S. Roy, R. Nagarajan, J. Kumar, B.-C. Ku, S –H. Lee, Soo-Hyoung 20070021587A1, 20080090103 A1, 20040198945A1, 20020183470A1 (2008-2007).
- 12–9. "Assembled hematin, method for forming same and method for polymerizing aromatic monomers using same" F. F. Bruno, Ferdinando, L. A. Samuelson, R. Nagarajan, J. Kumar, M. Sennett 20060078756A1, 20050208668A1, 20050208667A1, 20050208666A1 (2006-2005).
- 8–7. "Methods for polymerization of electronic and photonic polymers" F. F. Bruno; L. A. Samuelson, R. Nagarajan, J. Kumar 20050203276A1, 20050203275A1 (2005).
- 6–1. "Enzymatic template polymerization" L. A. Samuelson, F. F. Bruno, S. K. Tripathy, R. Nagarajan, J. Kumar, W. Liu, 20050147990A1, 20050084888A1, 20050084887A1, 20050079533A1, 20040023346A1, 20060041110A1 (2004-2006).

(iii) Patent Disclosures Filed to UMass CVIP Office (Patent application being prepared by Patent Attorneys/ Provisional Patent Filed)

2. "Non-halogenated flame retardant materials from phenolic polymers and co-polymers" S. Ravichandran, S. Nagarajan, B. C. Ku, E. B. Coughlin, J. Kumar, R. Nagarajan, US Patent Application (Submitted Spring 2010).
1. "Soybean peroxidase as a catalyst for enzymatic synthesis of conducting polymers" R. Bouldin, S. Ravichandran, A. Kokil, S. Nagarajan, J. Kumar, F.F. Bruno, L.A. Samuelson, R. Nagarajan, Patent (Disclosure Filed to CVIP summer 2010).

f. Professional Conference, Meeting Presentations and Panel Discussions

Invited Speaker, Panelist in Meetings/Conferences

Invited Presentation on "Safer surfactants for cleaning products" at TURI Greener Materials Research Symposium, Lowell, MA	May 2011
Conference Co-organizer and Invited Presentation on "Nanotechnology enabled Sensor Auto-ID" at the Auto-ID and Sensing Seminar & Expo, Merrimack College, Andover, MA	Oct. 2010
Invited Presentation on "Nanotechnology, Sensors and RFID – "A multidisciplinary approach to Sensing and Automatic Identification" and panel discussant – "University- Industry Collaboration in Auto-ID" , MIT Enterprise Forum, MIT Strata Center, Cambridge, MA	June 2010
Invited presentation on "Greener routes to non-halogenated flame retardants" at Toxics Use Reduction Institute 20th Anniversary Symposium, Bedford, MA	Nov. 2009
Invited poster and technology demonstration on "Novel RF sensors for Structural Health Monitoring" at the MIT Auto ID and Sensing Expo (organized by MIT Enterprise Forum of Cambridge)	Oct. 2009

Invited lecture on “Nanotechnology and its relevance to Radio Frequency Interrogation” at the AIDC conference on “Evolution of an RFID revolution”, Andover, MA	Oct. 2008
Invited lecture on “Sustainable Packaging –Aspirations, Perceptions and Reality” for the Institute of Packaging Professionals”, Lowell, MA	June 2008
Invited Speaker: “Sustainable Technologies – Green Chemistry & Engineering” at the “Massachusetts Democratic Convention” Lowell, MA	June 2008
Invited lecture: “Green Chemistry Principles for Synthesis of New classes of Materials” at the Green Chemistry & Commerce Council Innovators Roundtable: The Role of Tools, Labels, and Retail in Promoting Safer Chemistry, Lowell, MA	April 2007
Invited Lecture: “Introduction to Green Chemistry” at The New England Consortium (TNEC) for students from Environmental Technology Program at Essex Agricultural and Technical High School, Danvers, MA	Dec. 2006
Invited Lecture: “ Electronic and Photonic Polymers from Biocatalysis” at Gordon Research Conference on “Green Chemistry” Bristol, RI	July 2004
Invited Lecture: “Synthesis of electronic and photonic polymers complexed with DNA” at Anna University- K B Chandrasekhar center, Chennai, India	Aug. 2000

Contributed Lectures

Contributed lecture on “Novel Wireless Sensors for Structural Health Surveillance” at the 7 th International Workshop on Structural Health Monitoring at Stanford University, CA	Sept. 2009
Contributed lecture on “Biocatalytically Synthesis of Polypyrrole” at the 12 th Annual Green Chemistry and Engineering Conference”, Washington, D.C	June 2008
Contributed lecture: “Single-step biocatalytic synthesis of sexithiophene α -6T”, at the Materials Research Society Meeting, Boston, MA	Nov. 2005
Contributed Lecture: “Thiophene oligomer as a ‘redox mediator’ for the biocatalytic synthesis of poly(3,4-ethylenedioxythiophene) [PEDOT]” at the American Chemical Society Meeting, Philadelphia, PA	July 2004
Contributed Poster: “Synthesis of a Photoactive Azopolymer Complexed with Genomic DNA” at the American Chemical Society Meeting, Boston	Aug. 2002
Contributed Lecture: “Synthesis of Electronic and Photonic Polymers Intertwined with DNA” at the American Chemical Society Meeting, Chicago, IL	Oct. 2001
Contributed Lecture: “DNA Conformation Switching Using a Templated Conducting Polymer” at the American Chemical Society Meeting, Washington D.C.	Aug. 2000

D. INSTRUCTION-RELATED ACTIVITY

1. Teaching

List of Courses Taught (2006 - 2011)	Semesters, Year(s)	Level
26. 596 – Plastics, elastomers and additives from renewable resources	Fall 2010 Spring 2008 Spring 2007	Grad. Grad. Grad.
26.506 – Polymer Structure Properties & Applications	Fall 2011 Fall 2010 Fall 2009	Grad. Grad. Grad.
26. 535 - Rubber Technology	Spring 2010 Fall 2008 Fall 2007	Grad. & U.Grad. Grad. & U.Grad. Grad. & U.Grad.
26.595 - Thermoplastic elastomers	Spring 2009	Grad.
26.383 - Polymer Lab - I	Fall 2011 Fall 2010 Fall 2009 Fall 2008 Fall 2007	U.Grad. U.Grad. U.Grad. U.Grad. U.Grad.
26.384 - Polymer Lab – II	Spring 2011 Spring 2010 Spring 2009 Spring 2008	U.Grad. U.Grad. U.Grad. U.Grad.
31.251 -Chemistry of Health & the Environment (lab)	Fall 2006	U.Grad.

2. Student and Post-doctoral Researchers funded and advised

(i) Post-doctoral Researchers Supported

Dr. Ruchi Bakshi (2011 – present)
 Dr. Mario Cazeca (2009 – present)
 Dr. Jung Rae Park (2008 – 2009)
 Dr. Akshay Kokil (2008 –2009)

(ii) Graduate Students supported and advised (primary/co-advisor)

Student Name	Degree	Thesis Title	Primary/ Co-Advisor	Year
Ryan Bouldin	Ph.D	Oxidoreductase catalyzed synthesis of conjugated polypyrrole & polypyrrole derivatives	Primary Advisor	April 2011
Hernan Perma	M.S	Incorporation Of Virgin And Recycled Thermoplastics In UPVC-Based Blends	Co-Advisor	March 2011
Sharavanan Balasubramaniam	M.S	A Simple Approach for Fabrication of Passive, Wireless Sensing Elements and its Application in Structural	Primary Advisor	August 2009

		Health Monitoring		
Shreyans Shingi	M.S	Formulation and Characterization of Pressure Sensitive Adhesives for Impact-Resistant Glazing Films	Primary Advisor	Anticipated graduation 2011
Arun Nayak	M.S	Development of printable conductive inks for flexible electronics	Primary Advisor	Anticipated graduation 2011
Weeradech Kiratitanavit	M.S	Flame retardants based on combination of inorganic fillers and polyphenols	Primary Advisor	Anticipated graduation 2011
Zarif Farhana Mohd. Aris	M.S	Surface active polymers derived from Naturally Occurring Polysaccharides	Primary Advisor	Anticipated graduation 2012
Sethumadhavan Ravichandran	Ph.D	Sustainable routes to conjugated polymers and non-halogenated flame retardant materials	Primary Advisor	Anticipated graduation 2012
Timothy Ponrathnam	Ph.D	Synthesis and characterization of polymers for SAW sensors and electrochemical sensors	Primary Advisor	Anticipated graduation 2012

Graduated Students Supported			
Student Name	Level	Department	Period
Shivshankar Sivasubramanian	Masters	Plastics Engineering	2009-2010
Sharavanan Balasubramaniam	Masters	Plastics Engineering	2007-2009
Rahul Garhwal	Masters	Biological Sciences	2007-2008
Tarisha Mistry	Masters	Electrical Engineering	2007-2008
Santosh Biradar	Masters	Plastics Engineering	2009 summer
Charan Devarakonda	Masters	Biological Sciences	2008
Salvatore A. LoGrasso	Bachelors	Plastics Engineering	2007-2008

3. Other Activities and Accomplishments Related to Instructional Function

a. Seminar on ‘Green Plastics Manufacturing - Introduction to Plastics, Elastomers and Additives from Renewable Resources’

2008 – present: Conducted one-day industrial seminars on ‘Green plastics manufacturing: Introduction to Plastics, Elastomers and Additives from Renewable Resources’, organized by the ‘Continuing studies, corporate and distance education at UML’. This course provides an introduction to plastics, elastomers and additives that can be obtained from renewable resources. An overview of naturally occurring polymers including natural rubber, cellulose and starch-based materials, as well as polymers such as polylactic acid, poly(hydroxyalkanoates) that can be produced from naturally occurring precursors is provided. The class material includes additives from natural resources including natural

fillers, fibers and clay nanocomposites. Brief discussion of aspects of processing of these bio-based materials, bio-degradation and life cycle analysis is also included.

b. Customized Certificate Program in Polymer Science/Plastics Engineering for Saint Gobain Inc.

In 2011, in collaboration with Prof. Driscoll, initiated a customized certificate program in ‘Polymer science/plastics engineering’ for scientists and engineers at Saint Gobain Inc. Northboro, MA. This certificate consists of a total of 6 courses (3 required and 3 elective) that would be taught by UML faculty at Saint Gobain Inc.

c. Supervisory Activities & Mentoring

Nov. 2000 – Aug. 2005:

- Supervised doctoral students in chemistry and polymer science
- Mentored incoming freshmen during summer in the “Summer Opportunities in Science” program

Spring term (1998- 2001)

- Lectured and offered lab sessions on Scanning Probe Microscopy in the “AFM and X-Ray Diffraction of Materials” graduate level course

Summers (1997-2001)

- Conducted seminars on Thermal Characterization of materials (TGA, DSC, TMA) for scientists from the industry

Fall 1995 – Spring 1998

- Served as teaching assistant for Physical Bio-inorganic Chemistry Lab & undergraduate general chemistry labs (I&II)

E. SERVICE ACTIVITIES

1. Community activities related to professional expertise

Served on the panel for ‘Design for Environment’ – Environmental Protection Agency partnership program in ‘Flame-retardant alternatives for DecaBDE’ (2010 - 2011)

Research Experience for High School Students

- Summer 2011: Ms. Julia Pai**, Junior from Chelmsford High School was supported for 200 hours through the Research and Engineering Apprenticeship Program from the Academy of Applied Science on a project on “Enzymatic synthesis of Polyindoles”
- Summer 2010: Ms. Sahana Jayaraman** from West Windsor-Plainsboro High School, NJ Research project on enzymatic synthesis of Polyindoles and Polylactic acid. Won **New Jersey Academy of Science (NJAS) Grant in Aid Research Program Award (Jan. 2011)**
- Summer 2008: Ms. Connie Li**, - Junior from Chelmsford High School was supported for 200 hours through the Research and Engineering Apprenticeship Program from the Academy of Applied Science on a project involving the using of titanium dioxide for the photocatalyzed synthesis of hole transport layer for application in ‘*Organic Photovoltaics*’.

- d. **Summer 2008: Mr. Joshua Ross Infantine** from **Phillips Academy, Andover** was supported for 2 months on a research project focused on developing novel esterification reactions that can be carried out under benign conditions in aqueous media.
- e. **Summer 2008: Ms. Sheila Tripathy** a junior student at **University of Rochester**, was supported for a month during summer 2008 on a research project focused on enzymatic synthesis of oligomeric antioxidants based on ellagic acid.
- f. **October 2006:** Visited Madison Park High School in Roxbury, MA on October 24th 2006 and provided juniors and seniors the opportunity to assemble photovoltaic cells that used berry juice as the light harvesting material. The goal of this outreach activity was to provide the MPHS students with a flavor for Green Chemistry and in particular inspire juniors and seniors into pursuing higher education in science and engineering.

K-12 Outreach – Curriculum Enhancement

- a. **Spring 2009** – Demonstration of simple experiments in optics and lectures on history of optics for middle school students in a ‘Cluster Enrichment Program’ at Lowell Community Charter Public School.
- b. **Spring 2011, spring 2009:** Judge for region IV Middle School Science Fair.
- c. **August 2007:** Protocol testing of *Greener lab experiments* organized by Fisher Scientific – As member of the Green chemistry advisory council, tested protocol for series of four chemistry labs that apply principles of green chemistry. These experiments will form part of the undergraduate curriculum across U.S.
- d. **December 2006:** Participated in US-wide Assessment of Research Programs in 2006 for the “National Academy of Engineering”, Washington D.C.

2. Service to the Department and the University Community

(i) Establishing International Partnerships

- a. **Spring 2011:** Visited Sri Jayachamarajendra College of Engineering (SJCE) Mysore [One of the feeder institutions to the UML graduate program], in Jan 2011 with Prof. Steve Driscoll to establish partnerships and improve graduate student enrollment at UML by having a rapport with faculty members and students in SJCE
- b. **Spring 2010:**
- Led a Plastics Engineering department delegation to India and organized UML Alumni get together in Mumbai, India (March 2010). Over 50 Alumni and family took part in the luncheon.
 - Visited University Institute of Chemical Technology (UICT), Mumbai and Maharashtra Institute of Technology in Pune to promote UML’s plastics engineering program (recruit more students for graduate studies at UML).
 - Visited United States India Educational Foundation in Mumbai and Chennai, India to share details of UML plastics engineering program.
 - Visited 2 alumni owned plastics companies and the Indian Institute of Packaging in Mumbai.
- c. **Fall 2009:**

- Coordinated signing of a Memorandum of Agreement for education and research cooperation with Central Institute of Plastics Engineering Technology (CIPET) and the Plastics Engineering Department, UML.
- Organized visit of Dr. S. K. Nayak, CIPET's Director General and Dr. Shri Bijoy Chatterjee, secretary of the Government of India's Department of Chemicals and Petrochemicals to sign agreement.

d. Dec 2007:

- Represented UML plastics engineering department in Plastivision 2007, one of Asia's largest trade shows featuring 700 exhibitors (plastics manufacturers).
- The tradeshow attracted around 500,000 Plastics industry professionals and visitors over 5 days. UML plastics department had a booth at the exhibition, with the following goals
 - Improve enrollment in the Plastics engineering programs
 - Promote the on-line plastics engineering certificate programs
 - Meet with UML alumni and explore the possibility for bolstering endowments
 - Explore research and educational collaboration. The Central Institute of Plastics Engineering Technology (CIPET) has expressed interest in sending 11 of their faculty to UML for a training program in summer of 2009.

e. Spring 2007 onwards: Member of UML council on International Partnerships

f. Fall 2006: Member of International Students Task force

(ii) Developed a New 'Sustainable Polymeric Materials and Additives Certificate' program

Developed a Graduate Certificate in "Sustainable polymeric materials and additives" for plastics engineers at Plastics Engineering Department, UML. This graduate certificate has been approved by GPAC in Spring 2008.

(iii) Plastics Engineering Department faculty senator - Fall 2007-present

(iv) Thesis Examiner

Student Name	Program	Term
Shivshankar Sivasubramanian	M.S. Plastics Engineering	Fall 2010
Jimit Shukla	M.S. Plastics Engineering	
Prashant Agarwal	M.S. Plastics Engineering	
Sunny Gupta	M.S. Plastics Engineering	
Sivasankari Alagusundaram	M.S. Plastics Engineering	
Neeraj Pardhy	M.S. Plastics Engineering	Spring 2010
Robert Williams	M.S. Energy Engineering, Solar	Spring 2009
Laura Ingalls	M.S. Chemistry	Spring 2009
Eric Richard Morgan	M.S. Mechanical Engineering	Fall 2008
Venkateshwar Appaji	M.S. Plastics Engineering	Summer 2008
Bhavin Patel	M.S. Plastics Engineering	Spring 2008
Dhaval Shah	M.S. Plastics Engineering	
Dr. Langang Niu	M.S. Plastics Engineering	Fall 2007
Mr. Sachin Sharma	M.S. Plastics Engineering	
Ankit Gupta	M.S. Plastics Engineering	Fall 2006

(v) **Doctoral Proposal Examiner**

Student Name	Program	Term
Tatiya Trongsatitkul	Plastics Engineering	Fall 2010
Manuel Herdia	Mechanical Engineering	Spring 2010
Ben Bowers	Chemistry	Sum. 2008
Laura Ingalls	Chemistry	Spring 2008