

## David C. Martin, Ph.D.

Karl W. and Renate Böer Professor and Chair  
Materials Science and Engineering  
Professor of Biomedical Engineering  
The University of Delaware  
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Research Group Web Page: <http://cubic.mseg.udel.edu>

Google Scholar Citation Page: <http://scholar.google.com/citations?user=41kTcyYAAAAJ>

Google Scholar Citation Page: <http://tinyurl.com/98geuvt>

ISI Researcher ID: B-1838-2008

Scopus ID 7406286418

Scopus ID 35074584300

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### Research Interests:

High resolution transmission and low voltage electron microscopy studies of defects in polymers and organic molecular crystals; processing, microstructure, and properties of optoelectronically active polymers and organic materials for biomedical sensors, thin-film transistors, and light-emitting diodes; molecular engineering of benzocyclobutene-functionalized thermally crosslinkable polymers; biocompatible conducting polymers for microfabricated neural prostheses; and the microstructure of polymers and biopolymers near surfaces.

### Education:

February 1990: Doctor of Philosophy, Polymer Science and Engineering,  
The University of Massachusetts at Amherst.

April 1985: Master of Science, Macromolecular Science and Engineering,  
The University of Michigan, Rackham Graduate School.

April 1983: Bachelor of Science, Materials and Metallurgical Engineering,  
The University of Michigan, College of Engineering, *Summa Cum Laude*.

### Awards and Honorary Societies:

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|------|--|
| 2013 | University of Michigan Materials Science and Engineering<br>Distinguished Alumni Award |
| 2013 | President, Polymeric Materials Science and Engineering Division,                       |

American Chemical Society

2010 Fellow, American Physical Society, Division of Polymer Physics

2009 Karl W. Böer Chair of Materials Science and Engineering  
The University of Delaware College of Engineering

2008 UM Materials Science and Engineering Distinguished Achievement Award

2005 Fellow, American Institute for Medical and Biological Engineering (AIMBE)

2004 Honorary Professorship: Nanjing University of Science and Technology

2002 National Science Foundation Special Creativity Extension Award

2001 UM Materials Science and Engineering Distinguished Achievement Award

1999 President, Alpha Sigma Mu National Materials Engineering Honor Society

1997 Alexander von Humboldt Fellow

1996 Trustee, Alpha Sigma Mu National Materials Engineering Honor Society

1996 Faculty Advisor, Michigan Chapter of Alpha Sigma Mu Honor Society

1994 Outstanding Teacher in Materials Science and Engineering Award

1992 National Science Foundation National Young Investigator Award

1992 The University of Michigan College of Engineering 1938E Award

1992 Pi Kappa Alpha Fraternity Beta Tau Educational Commitment Award

1990 Sigma Xi Scientific Research Society

1990-1986 Shell Companies Foundation Doctoral Fellowship

1988 Electron Microscopy Society of America Presidential Student Award

1987 Arizona State Univ. High Resolution Electron Microscopy  
Corporate Fellowship

1986 Univ. of Massachusetts Polymer Science and Engineering Santos Go Award

1986 The University of Massachusetts Graduate School Fellowship

1984-1983 3M Company Fellow in UM Macromolecular Science

1983 Univ. of Michigan Chemical Engineering Research Paper Award

1982 Clarence A. Siebert Materials Engineering Award

1982 Tau Beta Pi National Engineering Honor Society

1981 Alpha Sigma Mu National Materials Engineering Honor Society

1979 The University of Michigan Regents-Alumni Scholar

1977 Eagle Scout Award, Boy Scouts of America

### **Professional Experience:**

July 2009 to present: Karl W. and Renate Böer Professor and Chair of Materials Science and Engineering, The University of Delaware, Newark, DE, 19716.

October 2010 to present: Professor of Biomedical Engineering, The University of Delaware, Newark, DE, 19716.

January 2007 to present: Founder and Chief Scientific Officer, Biotectix LLC, 1 Adams Place, 859 Willard Street, Suite 400, Quincy, MA 02169 ([www.biotectix.com](http://www.biotectix.com)), an Allied Minds Company ([www.alliedminds.com](http://www.alliedminds.com)).

June 2009 to July 2011: Adjunct Professor of Materials Science and Engineering, Biomedical Engineering, and Macromolecular Science and Engineering, The University of Michigan, Ann Arbor, MI, 48109.

June 2004 to July 2009: Professor of Materials Science and Engineering, Biomedical Engineering, and Macromolecular Science and Engineering, The University of Michigan, 2644 CSE Building, Ann Arbor, MI, 48109-2121.

September 2002 to December 2005: Director, Macromolecular Science and Engineering Center, 2541 Chemistry Building, 930 N. University Ave., Ann Arbor, MI 48109-1055.

September 2000 to September 2002: Interim Director, Macromolecular Science and Engineering Center, 2541 Chemistry Building, 930 N. University Ave., Ann Arbor, MI 48109-1055.

January 1999 to June 2004: Associate Professor of Biomedical Engineering, Biomedical Engineering Department, The University of Michigan, 2022 H. H. Dow Building, Ann Arbor, MI 48109-2136.

September 1997 to August 1998, Visiting Alexander von Humboldt Research Fellow, Max-Planck Institut für Polymerforschung, Mainz, Germany.

June 1996 to June 2004: Associate Professor of Materials Science and Engineering and Macromolecular Science and Engineering, Materials Science and Engineering Department, College of Engineering, The University of Michigan, 2022 H. H. Dow Building, Ann Arbor, MI 48109-2136.

June 1995-August 1995, Visiting Scientist, Philips Laboratory, Edwards Air Force Base, CA, 93524-7680.

August 1990 to June 1996: Assistant Professor of Materials Science and Engineering and Macromolecular Science and Engineering, Materials Science and Engineering Department, College of Engineering, The University of Michigan, 2022 H. H. Dow Building, Ann Arbor, MI 48109-2136.

September 1989 to August 1990: Visiting Scientist, E. I. du Pont de Nemours & Co., Central Research and Development, Wilmington, DE, 19880-0356.

September 1985 to September 1989: Research Assistant, Polymer Science and Engineering, The University of Massachusetts at Amherst, Amherst, MA, 01003.

May-August 1985 and May-August 1984: Research Engineer, General Motors Research Laboratories, General Motors Technical Center, Warren, MI, 48090-9055.

January 1985-May 1985: Teaching Assistant, Materials and Metallurgical Engineering and Macromolecular Science and Engineering, The University of Michigan, Ann Arbor, MI, 48109.

May-August 1983: Process Development Engineer, IBM Corporation, General Technology Division, Essex Junction, VT.

May-August 1982: Research Engineer, General Electric Company, Carboloy Systems Division, Detroit, MI.

September 1981-May 1983: Resident Advisor, The University of Michigan Housing Division, Ann Arbor, MI, 48109.

### **Professional Societies:**

Alpha Sigma Mu Materials Engineering Honor Society

President, 2000-2001

Webmaster, 2001-2007

American Chemical Society

Polymer Chemistry (POLY) Division

Polymeric Materials Science and Engineering (PMSE) Division

POLY Division Representative: Materials Secretariat: 2001

PMSE Member-at-Large: 2002-2003

PMSE Treasurer-Elect, 2008

PMSE Treasurer, 2009-2010

PMSE Vice-Chair, 2011-2012

American Institute for Medical and Biological Engineering (AIMBE)

Fellow, 2005

American Physical Society (APS)

Division of High Polymer Physics

Fellow, 2010

American Society of Engineering Education

Materials Research Society (MRS)

Symposium Organizer: Fall 1994, Fall 2001, Fall 2004, Spring 2011

Meeting Organizer: Fall 2002

Member, Young Investigator Awards Committee: 2006-2010

Member, Program Committee: 2010-current

Microscopy Society of America

Symposium Organizer: August 1993

Society for Imaging Science and Technology

American Crystallographic Association (ACA)

Society of Plastics Engineers (SPE)

Symposium Organizer: 2000

Society for the Advancement of Material and Process Engineering (SAMPE)

ASM International: The Materials Information Society

Chapter Operations Committee

The Fiber Society

The Metals, Minerals, and Materials Society (TMS)

Chairperson, Detroit Area Chapter, 1993-1994

University Materials Council (UMC)

Member, Policy Committee, 2011  
Surfaces in Biomaterials Foundation

**Research Funding:**

**The University of Michigan (1990-2009)**

\$1,200	3/29/91	International Academic Affairs Travel Award	Horace H. Rackham School of Graduate Studies
\$8,775	9/1/90	Equipment Grant	E. I. du Pont de Nemours & Co.
\$4,294	12/13/90	Polymer Bicrystals	Michigan Memorial-Phoenix Project
\$8,000	6/91-9/91	Morphology of Synthetic Poly(peptides)	Protein Polymer Technologies, Inc. San Diego, CA
\$180,000 3 yrs	9/91-9/94	Polymer Bicrystals DMR-9024876	National Science Foundation Division of Materials Research: Polymers Branch
\$10,000	5/91	Structural Organization of Poly(imides) Near Surfaces	E. I. du Pont de Nemours Co. Wilmington, DE & Circleville, OH
\$350,000 2 yrs	6/92-6/94	Poly(aminoketones) (PAKs) New High Performance Polymers for Lightweight Structures (J. S. Moore, Chemistry, Co-PI)	U. S. Army Advanced Concepts Technology Committee Natick, MA DAAK60-92-K-0005
\$44,886	9/91-12/92	Near-Surface Deformation of Poly(propylene)-Talc Composites	General Motors Corporation Inland Fisher Guide Division
\$32,000/yr	6/92-6/93	Structural Transitions in Synthetic Poly(peptides)	Protein Polymer Technologies, Inc. San Diego, CA
\$337,500/ 5 years	7/92-7/97	National Young Investigator Award DMR-9257569	National Science Foundation Division of Materials Research

\$8,000	6/93-6/94	Fiber Spinning of Synthetic Poly(peptides)	Protein Polymer Technologies, Inc. San Diego, CA
\$75,000 / 3 years	6/93-6/96	Young Professor Award	DuPont Company Wilmington, DE
\$66,000 / 3 years	7/93-7/96	Influence of Defects on Optical Properties of Poly(diacetylenes) NGT-51120	National Aeronautics and Space Administration: Marshall Space Flight Center, Huntsville, AL
\$5,000	9/93-1/96	Computer Modeling and Analysis of High Resolution Electron Diffraction and Imaging of Polymers	Dow Chemical, Co. Analytical Sciences Midland, MI
\$10,000	1/94-1/95	Thermotropic Liquid Crystalline Polymers	Hoechst-Celanese Corp. Summit, NJ
\$10,000	1/94-12/94	Surface Deformation of Polymers and Polymer Composites	Ford Motor Company Vehicle Interior Division Saline, MI
\$24,200	7/94-12/95	Acquisition of X-ray Diffraction Apparatus for Polymer Research	National Science Foundation Division of Materials Research Washington, DC DMR-9412254
\$17,190	9/94-12/94	Characterization of Thermally Crosslinked High Performance Polymer Fibers	Batelle Laboratories (U. S. Army Natick Res. Dev. & Eng. Center)
\$562,508	9/94-9/97	Surface Modification for Biocompatibility (K. Sue O'Shea, Medical School, Co-PI)	National Institute of Health RFP NIH-NINDS-94-04 Contract NO1-NS-5-2322
\$10,000	1/95-1/96	Thermotropic Liquid Crystalline Polymers	Hoechst-Celanese Corp. Summit, NJ

\$8,000	2/95-1/96	Computer Simulations of Atomic Force Microscope Images of Polymers	Dow Chemical Company Analytical Sciences Midland, MI
\$60,000	1/95-1/96	Optoelectronically Active Polymers for Flat Panel Displays	The University of Michigan Display Technology Manufacturing Center
\$180,000	6/95-6/98	Electric-Field Mediated Processing of Bioactive Protein Polymers	The Whitaker Foundation Washington, DC
\$72,623	9/1/95-8/31/96	Thermally Crosslinkable Flame Resistant Polymers	National Institute for Standards and Technology
\$22,750	1/96-12/96	Morphology of Jeffamine Modified Polymers	Huntsman Chemical Corp.
\$75,000		Optoelectronically Active Polymers (w. M. David Curtis, Jerzy Kanicki)	Office of the Vice-President for Research, The University of Michigan
\$17,000	1/97-12/98	Morphology of Polyetheramine-Polypropylene Blends	Huntsman Chemical Co. Austin, TX
\$245,000	7/97-7/2000	Construction and Characterization of Grain Boundary Defects in Semiconducting Crystalline Polymers	National Science Foundation Washington, DC DMR-9707975
\$248,510	8/97-8/98	Acquisition of an Electron Energy Imaging Filter for the JEOL 4000 EX at the University of Michigan Electron Microbeam Analysis Laboratory	National Science Foundation and the University of Michigan DMR-9704175

\$218,404	6/97-6/2000	Micromechanisms of Surface Deformation of Thin Polymer Coatings on Semicrystalline Polymer Substrates	DuPont Automotive Products Philadelphia, PA
\$1,132,154		Acquisition of a Field-Emission TEM (PI: J. E. Mansfield) DMR-9871177	National Science Foundation Washington, DC
\$2,700,000		Materials Chemistry IGERT (PI: M. D. Curtis)	National Science Foundation Washington, DC
\$2,600	5/99-8/99	Electrochemical Deposition of Conducting Polymer Coatings on Neural Prosthetics	Sloan Fellowship to Xinyan Cui The University of Michigan
\$2,600	5/99-8/99	Structural Characterization of Optoelectronically Active Polymers	Sloan Fellowship to Lebyz Gonzalez, The University of Michigan
\$736,606/yr \$3,300,000 total share: 0.5 summer months/year	1/1999-1/2004	Center for Neural Communications Technology	National Institute of Health Bethesda, MD PI: David J. Anderson
\$100,000	10/99-3/2003	Structural and Physical Characterization of Nitrocellulose-Acrylic Blends in Thin Films	Revlon Edison, NJ
\$45,488	3/2000-3/2001	Morphology of Rigid-Rod Polymer Fibers	Army Research Office, via the State University of New York at Stony Brook
\$305,677	7/2000-7/2003	Dislocation-Mediated Lattice Curvature in Crystalline Polymers	National Science Foundation Division of Materials Research DMR-0084304
\$50,000	5/2001-2003	Intercortical Recording Electrodes	NIH, Kensall Wise PI



\$569,173	7/2001-7/2004	Acquisition of a Confocal Laser Scanning Microscope for Research and Research Training in Nanoscale Engineering of Complex Fluids and Biomaterials	National Science Foundation CTS-0116331 Michael Solomon, PI
\$1,994,272 10% AY, 1 mo. Summer	9/2001-9/2005	Biomaterials for the Central Nervous System: NIH-NINDS-N01-NS-1-2338	National Institute of Health National Institute of Neurological Disorders and Stroke
\$21,146	7/2000-7/2003	Low Voltage Microscopy of Organic Molecular Crystals	National Science Foundation Division of Materials Research and International Programs Office: Supplement to DMR-0084304
\$69,475 0%	1/2002-12/2002	Electrospinning of Polymer Fibers	Foster-Miller, Inc.: SBIR subcontract to the U. S. Army
\$9,300	4/2002-4/2003	Designer Biomaterials for the Central Nervous System	University of Michigan Undergraduate Research Opportunities Program
\$127,500 0%	9/2002-9/2005	Bioscience and Engineering Institute	NASA NNC04AA21A PI: James Grotberg, Michigan
\$335,000	9/2003-9/2005	Acquisition of a High Resolution Transmission Electron Microscope for the University of Michigan Electron Microbeam Analysis Laboratory	National Science Foundation PI: John Mansfield Co-PIs: Eric Essene, Lumin Wang IMR-0315633
\$900,000	9/2003-9/2005	Acquisition of a Focused Ion Beam System for the University of Michigan Electron Microbeam Analysis Laboratory	National Science Foundation PI: Rod Ewing MRI-0320740

\$212,000 1 mo. Sum.	7/2003-7/2005	Dislocation-Mediated Lattice Curvature in Crystalline Polymers	National Science Foundation Division of Materials Research Special Creativity Extension Award
\$419,293 0%		Acquisition of an XPS for Materials Research	National Science Foundation PI: Joerg Lahann DMR-0420785
\$795,289 0%	10/2004-10/2009	Fibrous Templates for Directed Nerve Regeneration	National Institute of Health PI: Eva Feldman KO8 Training Grant for Joseph Corey, M.D.
\$224,000 1 mo. Sum.	7/05-7/07	Structure and Properties of Defects in Organic Molecular Semiconductors	NSF DMR-0518079
\$143,869/ five years	5/05-5/06	Implantable Neural Interfaces for Sharks	DARPA Daryl Kipke, PI
\$5,596,715 (DCM share \$1,188,359)	9/06-9/11	Bio-Integrating Structural and Neural Prosthetic Materials	Army Research Office MURI. Co-PIs: Daryl Kipke, Paul Cederna, Steven Goldstein Grant W911NF-06-1-0218
\$48,796	5/06-5/07	Novel Conductive Biomaterials for the CNS	National Institute of Health 1 F32 NS054618-01 NSRA Training Fellowship for Dr. Sarah Richardson-Burns
\$200,000	2/06-2/08	Near-Surface Characterization of Thermoplastic Polyolefins	Ford Motor Company
\$136,000	1/07-1/08	Acquisition of a Low Voltage Electron Microscope	Department of Defense DURIP
\$30,000	9/1/07 – 9/1/08	In-Situ Polymerization of PEDOT in Peripheral Nerve	National Academies Keck Futures Initiative (with W. Grill, Duke)

\$25,214	5/1/2007-4/30/2008	Novel Conductive Polymer Biomaterials for the CNS	National Institutes of Health 5 F32 NS054618-02 NSRA Training Fellowship for Dr. Sarah Richardson-Burns
\$33,797	8/15/2007-8/14/2008	Improved Efficacy of Cochlear Implants by Directed Regrowth of the Auditory Nerve	National Institute of Health 1 F31 DC009134-01A1 Research Training grant for Jen Chikar, Bryan E Pfingst, PI
\$100,000	9/1/07-9/1/10	Bicontinuous Conducting Polymer Cubic Phases	American Chemical Society Petroleum Research Fund
\$21,800	1/08-1/09	Fluid Delivery System for Osseointegrated Hearing Implant	COE Translational Research (GAP) Fund
\$345,000	7/08-7/11	Defect Structures and Properties of Liquid Crystalline Polymer Semiconductors	National Science Foundation Division of Materials Research Polymers: Andrew Lovinger DMR-0802655
\$217,000 (DCM share \$117,000)	1/08-12/08	Conducting polymer coatings for implanted cardiac device electrodes	Michigan Universities Commercialization Initiative (MUCI), Andy McColm, PI with Biotectix, Hani Sabbah, Henry Ford Health System, Detroit, MI
\$995,000	7/08-12/09	Conducting Tissue Scaffolds for Peripheral Nerve Regeneration	MURI Supplement Army Research Office
<b>The University of Delaware (2009-present)</b>			
\$1,101,600	6/10-6/14	Direct Integration of Cortical Electrodes by Conducting Polymers Deposited In-Vivo	NIH EUREKA competition RO1 1R01EB010892
\$375,000	6/11-6/14	Synthesis, Structure, and Properties of Oriented Conjugated Polymer Nanofibers	National Science Foundation Division of Materials Research: Polymers Branch: Andy Lovinger DMR-1103027

\$2,994,000 (DCM Share \$190,097)	8/11-8/14	Soft, Directly Integrated Peripheral Nerve Interfaces	DARPA N66001-11-C-4190 Paul Cederna, PI The University of Michigan
\$50,000 (DCM \$0 consult only)	5/1/2012- 5/1/2013	Recyclable porous SiO <sub>2</sub> supported transition metal catalysts for active pharmaceutical ingredients (APIs)	Delaware Bioscience Center for Advanced Technology (CAT) PI: Chaoying Ni
\$19,974	9/1/2012-8/3 1/2014	Clinical Immersion Experience for Biomedical Engineering Students	Delaware Health Science Alliance Co-PIs: C. Galloway, X. Jia, D. Elliott, K. L. Kiick, and J. Higginson

### **Proposals Pending:**

\$75,000	7/12-7/13	Local Electrochemical Polymerization as a Lung Cancer Therapy W81XWH-11-LCRP-CA	Lung Cancer Research Program Concept Award Department of Defense Congressionally Directed Medical Research Program
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### **Proposals in Preparation**

\$525,000		MRI: Acquisition of a Multipurpose X-ray Diffraction (XRD) Instrument for the University of Delaware Interdisciplinary Science and Engineering Laboratory	National Science Foundation Division of Materials Research Major Research Instrumentation Program DMR-1229479
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### **Professional Consulting:**

Harness, Dickey & Pierce  
Johnson Controls  
State Farm  
Flint Ink  
Hoechst-Celanese  
Revlon  
Foster-Miller  
Delphi Automotive  
Huntsman Chemical  
Advent Engineering

Triton Systems  
TRW, Inc.  
Liebherr, Inc.  
Gil Vardi, M.D.  
Productive Research LLC

### **Academic Committee Service:**

The University of Michigan (1990-2009)

Curriculum Committee, College of Engineering  
Intercollegiate Materials Advisory Committee, University of Michigan  
Science Library Advisory Committee, University of Michigan  
Scholastic Standing Committee, College of Engineering  
MSE Departmental Review Committee, College of Engineering  
MSE Chairman's Advisory Committee, Materials Science and Engineering  
Executive Committee, Macromolecular Science and Engineering  
Undergraduate Program Committee, Materials Science and Engineering  
Graduate Program Committee, Materials Science and Engineering  
Outreach Committee, Materials Science and Engineering  
MSE Departmental Review Committee, Materials Science and Engineering  
Department Chair Search Committee, Materials Science and Engineering  
Interdisciplinary Programs Committee, College of Engineering  
Bio-Faculty Search Committee, Materials Science and Engineering,  
Chemical Engineering, and Biomedical Engineering  
Chairs Advisory Committee, Materials Science and Engineering  
Undergraduate Program Committee, Materials Science and Engineering  
Faculty Committee on Discipline, College of Engineering  
Chair, Faculty Search Committee, Materials Science and Engineering  
School of Dentistry, Provost's Review Committee, University of Michigan

The University of Delaware (2009-present)

Chair, Equipment Committee, College of Engineering  
Interdisciplinary Science and Engineering Building Design Committee  
Department Chair's Caucus, The University of Delaware  
University Research Council, Vice Provost for Research  
Graduate Tuition Committee, College of Engineering  
Co-Chair, Nanofabrication Facility Committee, Vice Provost for Research  
Faculty Search Committee, Biomedical Engineering

### **Teaching Experience**

#### **The University of Michigan**

Fall 1990	MSE 250	Introduction to Materials Science
Winter 1991	MSE 412	Introduction to Polymer Materials Science

Fall 1991	MSE 430	Thermodynamics of Materials
Winter 1992	MSE 412	Introduction to Polymer Materials Science
Fall 1992	MSE 430	Thermodynamics of Materials
Winter 1993	MSE 412	Introduction to Polymer Materials Science
Fall 1993	MSE 460	X-ray Diffraction and Crystallography
Winter 1994	MSE 412	Introduction to Polymer Materials Science
Fall 1994	MSE 512	Polymer Physics
Winter 1995	MSE 460	X-ray Diffraction and Crystallography
Fall 1995	MSE 250	Introduction to Materials Science
Fall 1996	MSE 560	Advanced X-ray Diffraction and Crystallography
Winter 1997	MSE 560	Advanced X-ray Diffraction and Crystallography
Fall 1998	MSE 430	Thermodynamics of Materials
Winter 1999	MSE 220	Introduction to Materials and Manufacturing
Fall 1999	MSE 412	Introduction to Polymer Materials Science
Winter 2000	MSE 512	Polymer Physics
Fall 2000	MSE 220	Introduction to Materials and Manufacturing
Winter 2001	MSE 562	Electron Microscopy I
Fall 2001	MSE 512	Polymer Physics
Winter 2002	MSE 220	Introduction to Materials and Manufacturing
Fall 2002	MSE 480	Materials Design
Winter 2003	MSE 500	Materials Physics and Chemistry
Fall 2003	MSE 560	Structure of Materials
Winter 2004	MSE 500	Materials Physics and Chemistry
Fall 2004	MSE 532	Thermodynamics of Materials II
Winter 2005	MSE 500	Materials Physics and Chemistry
Fall 2005	MSE 412	Polymeric Materials
Fall 2006	MSE 412	Polymeric Materials
Fall 2006	MSE 251	Biomaterials: MSE 250 Focus Course
Winter 2007	MSE 562	Electron Microscopy I
Fall 2007	MSE 412	Polymeric Materials
Winter 2008	MSE 220	Introduction to Materials and Manufacturing
Fall 2008	MSE 330	Thermodynamics of Materials
Winter 2009	MSE 500	Materials Physics and Chemistry

### **The University of Delaware**

Spring 2010	MSEG 302	Introduction to Materials Science and Engineering
Spring 2011	MSEG 609	Structure and Properties of Materials II
Fall 2011	MSEG 608	Structure and Properties of Materials I
Spring 2012	MSEG 609	Structure and Properties of Materials II
Spring 2013	MSEG 609	Structure and Properties of Materials II

### **Ph.D. Committee Service**

#### ***The University of Michigan:***

Shyh-Lung Hwang, "Fabrication, Microstructural Characterization, and Deformation of Superplastic Sialon Ceramics", Materials Science and Engineering, Chair: I. Wei Chien

Kevin James Bouck, "Synthesis and Characterization of Polyamides Containing Imidazole", Macromolecular Science and Engineering, Chair: Paul Rasmussen

James Edward Polli, "Mechanistic Analysis of Bile Acid Sequestrant Performance", Pharmacy, Chair: Gordon Amidon

Gary A. Deeter, "Design, Synthesis, and Characterization of Reactive Aromatic Polymers", Chemistry, Chair: Jeffrey S. Moore

Charlotte Drumm, "Raman Microprobe Imaging", Chemistry, Chair: Michael Morris

Lisa Chen, "The Effect of the Secondary Relaxation on Mechanical Properties of PET/PCT Copolymers", Materials Science and Engineering, Chair: Albert Yee

Apostolis Samelis, "Analysis of the Nonlinear Characteristics of Microwave Power Heterojunction Bipolar Transistors and Optoelectronic Integrated Circuits", Electrical Engineering and Computer Science, Prof. Dimitris Pavlidis, Chairperson.

Adnan Mansour, Chemistry, Chair: David Curtis

Jeffrey Politis, "Tuning Optical, Electrochemical, and Structural Properties of Poly(aromatic heterocycles)", Chemistry, Chair: David Curtis

Geoff Gardner, Chemistry, "Construction of Porous Organic Coordination Solids", Chair: Stephen Lee

Alan Kiste, "Synthesis of Side-chain Liquid-Crystalline Polymers", Macromolecular Science and Engineering, Chair: Colleen Pugh

Adriana Eleni Lita, "Correlation Between Microstructure and Surface Structure Evolution in Polycrystalline Films", Materials Science and Engineering, Chair: John E. Sanchez Jr.

Heather Clark, "Polydiacetylene-based Molecular Interaction Sensors", Chemistry, Chair: Christine Evans

Xiaoyong Lu, "Nonisothermal Experimental and Analytical Study of Viscoelastic Fiber Drawing", Mechanical Engineering, Chair: Ellen Arruda

Ken Hrdina, "Phenomena During Thermal Removal of Binders", Materials Science and Engineering, Chair: John Halloran

Carl Aronson, "Structure-Property Relationships for N-Alkyl Isocyanate Containing Polymers", Macromolecular Science and Engineering, Chair: Robert Zand

Mark Mowery, “Interfacial Design with Polydiacetylene Monolayers”, Chemistry, Chair: Christine Evans

Matthew Bruckwicky, “Synthesis of Poly(thiophene)-Poly(bithiazole) Copolymers”, Chemistry, Chair: M. David Curtis

Yan Wang, “Plastic Deformation Modeling of Semicrystalline Polypropylene”, Chair: Ellen Arruda, Mechanical Engineering

Wendy Blanda, “Spectroscopy of Poly(alkylbithiazoles)”, Macromolecular Science and Engineering, Co-Chairs: M. David Curtis, Rick Francis, Chemistry

Jon Rowley, “Controlling Myoblast Phenotype with RGD-Modified Alginate Matrices”, Biomedical Engineering, David Mooney, Chair, Chemical Engineering

David Vodak, “The Development of Synthetic Methods for the Formation of Rationally Designed and Covalently Linked Extended Organic Frameworks”, Chair, Omar Yaghi, Chemistry

Nathaniel L. Rosi, “Design of New Metal-Organic Frameworks: Non-Interpenetrating Structures, Expanded Pore Dimensions, and Pore Functionalization”, Chair, Omar Yaghi, Chemistry.

Hailian Li, “Construction of Porous Framework Structures with Germanium Oxides and Indium Sulfides”, Chair, Omar Yaghi, Chemistry.

Nathan W. Ockwig, “Design and Synthesis of Metal-Organic Frameworks with Transition Metal Clusters”, Chair: Omar Yaghi, Chemistry.

Todd Menna, “Studies of the Affect of High Electric Fields on Poly(n-hexyl isocyanate)/p-xylene Solutions”, Chair: Frank Filisko, Materials Science and Engineering.

Hengqin Cheng, “Alkoxysilanes, Silatranes, and Octahedral Silsesquioxanes from Silica”, Chemistry, Chair: Richard M. Laine

Wei Xu, “Mechanical Behavior, Texture Evolution and Constitutive Modeling of alpha and beta Crystalline Isotactic Polypropylene”, Macromolecular Science and Engineering, Chair: Ellen M. Arruda.

Manish Chopra, “Brownian Dynamics Simulations of Flowing Isolated Polymer Molecules in Dilute Solution Near Surfaces”, Chemical Engineering, Co-Chairs: Mark A. Burns and Ronald G. Larson. Ph.D. Defense held in the morning of September 11, 2001.

Lin Fang, “Molecular Imaging of Shear-Induced Polymer Migration Near a Wall in Dilute and Semidilute Solutions”, Chair: Ronald Larson, Chemical Engineering.



Jie Luo, “Machining of Elastomers”, Chair: Albert Shih, Mechanical Engineering

John Nanos, “The Synthesis, Characterization, and Structure-Property Relationships of Regioregular 4-4'-dialkyl-2,2'-bithiazole Oligomers and Polymers”, Macromolecular Science and Engineering, Chair: M. David Curtis, Chemistry

Chad Brick, “The Functionalization of Octaphenylsilsequioxane”, Chemistry, Chair: Richard Laine, Materials Science and Engineering

Michael Hamilton, “Polyfluorene-based Organic Field Effect Transistors”, EECS, Chair: Jerzy Kanicki

Soon Kim, “Fused Deposition of Polymer Structures for Tissue Engineering”, ME, Chair: Suman Das

Jennifer Lu, “Self-Assembled Block Copolymers for Nanotube Synthesis”, Macromolecular Science and Engineering, Chair: Erdogan Gulari

Xinnan Zhang, “Synthesis of Fused Thienoacenes and Polythiophenes”, Chemistry, Chair: Adam Matzger

Ying Wang, “Green Synthesis of Water Soluble Semiconductor Nanocrystals and Their Applications”, Materials Science and Engineering, Chair: Nicholas A. Kotov

Leenaporn Jongpaiboonkit, “Calcium Phosphate Scaffolds for Bone Tissue Engineering and Self-Association PEG-PLLA Diblock Copolymer for Controlled Drug Delivery System”, Materials Science and Engineering, John W. Halloran and Scott J. Hollister, Co-Chairs.

Patrick Shea, “Electronic Properties of Porphyrin-Based Organic Transistors”, Electrical Engineering and Computer Science, Chair: Jerzy Kanicki

Ben Furman, “Liquid Crystalline POSS Substituents”, Materials Science and Engineering, Chair: Richard Laine

Kyung-Ho Roh, “Biphasic Nanoparticles”, Macromolecular Science and Engineering, Chair: Jeorg Lahann

Kangwon Lee, “Conjugated Polymer Biosensors”, Materials Science and Engineering, Chair: Jinsang Kim.

Youngsuk Heo, “Universal Scaling of Linear and Nonlinear Rheological Properties of Semidilute and Concentrated Polymer Solutions”, Macromolecular Science and Engineering, Chair: Ronald G. Larson.

Diana Yazmin Siberio-Perez, “Adsorption of Gases and Large Polycyclic Organic Molecules in Metal-Organic Frameworks”, Macromolecular Science and Engineering, Chair: Adam J. Matzger

Jiseok Lee, Jinsang Kim

Bong Sup Shim, Nick Kotov

Paul Podsiadlio, Nick Kotov

Michael Z. Asuncion, “Novel Syntheses, Functionalization, and Applications of Octa-, Deca-, and Dodecasilsesquioxanes”, Macromolecular Science and Engineering, Chair: Richard M. Laine.

***The University of Delaware:***

Xiaoqian Ma, Materials Science and Engineering, “Molecular Alignment in Electrospun PVDF Fibers”, Advisor: John F. Rabolt

Darrin Pochan student, Self-assembly of block copolymers by cryo-TEM

Chelsea Haughn, Materials Science and Engineering; Matt Doty, Advisor

Dan Yang, Materials Science and Engineering, Advisor: Robert Opila

**Research Mentorship:**

***The University of Michigan:***

**Post-Doctoral Scholars:**

Yu Shen, Ph.D., 1982, “Microstructure of Silk-Like Proteins”.  
Current location: Windsor, ON, Canada

Brendan Foran, Ph.D., Chemistry, 1996, The University of Michigan, “Microstructure of Poly(ether amine)-Polypropylene Blends”.  
Current location: Sematech, Austin, TX

Libby Louie, Ph.D., Materials Science and Engineering, 1996, Massachusetts Institute of Technology, “Patterned Deposition of Bioactive Protein Polymer Films”.  
Current location: Austin, TX

Christian Kübel, Ph.D. Chemistry, 1998, Max-Planck Institut für Polymerforschung, “Curvature in Polymer Nanocrystals”.  
Current location: Karlsruhe, Germany.

Michael Johnson, Ph.D., Macromolecular Science and Engineering, “Structure-Property Relationships in Nail Enamel Formulations”, 2000.  
Current location: Amgen, Thousand Oaks, CA.

Yinghong Xiao, Ph.D. in Polymer Materials Science and Engineering, Nanjing University of Science and Technology, 1995, “Electrochemical Deposition of Polymers for Neural Prosthetic Devices”.

Current location: Associate Professor of Chemical Engineering, Nanjing University of Science and Technology, Nanjing, China.

Junyan Yang, “Microstructural Studies of Organic Crystals and Biopolymer Films”.

Current location: Dow Chemical Company, Freeport, TX.

K. Narayan, “Microstructure of Bacteriorhodopsin Thin Films by Low Voltage Electron Microscopy”

Current location: Associate Professor, Bangalore, India.

Sarah Richardson-Burns, Ph.D. 2000, University of Colorado, “Biological Studies of Materials in the Central Nervous System”.

Donghwan “Richie” Kim, Ph.D. 2005, University of Michigan, “Polymer Coatings for Neural Prosthesis”

Current location: Assistant Professor, Nanyang Technical University, Singapore.

Jihua Chen, “Structure of Thermoplastic Polyolefins”, Ph.D. 2006, University of Michigan

Current location: Oak Ridge National Laboratory, Oak Ridge, TN.

Antonio Peramo, “Regenerative Skin-Prosthesis Interfaces”, PhD 2006, University of Central Florida

Hyunei Lim, Korean Institute of Machinery and Materials, “In-Situ Polymerization of PEDOT”, Summer 2008

Bong Sup Shim, Ph.D. 2009, The University of Michigan, The University of Delaware  
Electrically Conductive Scaffolds for Neural Regeneration

Whirang Cho, Ph.D. 2010, Korea, “Bicontinuous PEDOT Cubic Phases”

Minsoo Kim, Ph.D. 2011, Korea, “Multilayer PEDOT Quantum Dot Coatings”

***The University of Delaware:***

Bong Sup Shim, Ph.D. 2009, The University of Michigan, The University of Delaware  
Electrically Conductive Scaffolds for Neural Regeneration

Katie Feldman, Ph.D. 2009, The University of California at Santa Barbara, "Biologically Functional Conducting Polymers for Biomedical Device-Tissue Interfaces"

Rylie Green, Lecturer, University of New South Wales, Sydney, Australia  
"Rheology of In-Situ Polymerization of Conducting Polymers in Hydrogels"

Whirang Cho, "Ordered PEDOT Microstructures"

Minsoo Kim,  
"Morphology of PEDOT in Living Tissue"

### **Graduate Students:**

#### ***The University of Michigan***

Jaime Ojeda, Macromolecular Science and Engineering, M. S., January (1993)  
"High Resolution Microscopy of PMDA-ODA Poly(imide)"  
Current location: 3M Film Technology Division, St. Paul, MN  
<http://www.linkedin.com/in/jrojeda>

Juliana Mobley, Materials Science and Engineering, M. S., June (1993)  
"Microstructural Evolution of Poly(imides) During Thermal Curing"  
Current location: Syndey, Australia  
<https://www.facebook.com/juliana.harmeling>

Jennifer Rigney, Materials Science and Engineering, M. S., June (1994)  
"Mechanical Properties of PPTA-co-XTA Copolymer Fibers"  
Current location: BASE, Detroit Area, MI  
[www.linkedin.com/pub/jennifer-rigney/0/138/603](http://www.linkedin.com/pub/jennifer-rigney/0/138/603)

Patricia M. Wilson, Materials Science and Engineering, Ph.D., November (1994)  
"Microstructure and Modeling of Edge Dislocations and Grain Boundaries in Polydiacetylenes"  
Current location: Thistle Treads, Inc., Arlington, MA  
[www.thistlethreads.com](http://www.thistlethreads.com)

J. Philip Anderson, Macromolecular Science and Engineering, M.S., (1994)  
"Structural Evolution in Genetically Engineered Protein Polymers"  
Current location: Okemos, MI

Jun Liao, Materials Science and Engineering, Ph.D., March (1995)  
"Construction and Characterization of Polymer Bicrystals"  
Current location: Rhodia Chemicals, Shanghai City, China  
[cn.linkedin.com/pub/jun-liao/24/8b0/91a](http://cn.linkedin.com/pub/jun-liao/24/8b0/91a)

Marie-Christine Jones, Materials Science and Engineering, Ph.D., October (1995)  
"Micromechanisms of Deformation in Crosslinked Extended-Chain Polymers"

Current location: General Motors Corporation, Warren, MI

Gary Spilman, Macromolecular Science and Engineering, Ph.D. (1996)  
"The Use of Difunctional Benzocyclobutene Monomers in Polymer Synthesis"  
Current location: Eastman Chemical, Chicago, IL  
<http://www.linkedin.com/pub/gary-spilman/b/297/55>

Elizabeth Pingel, Macromolecular Science and Engineering, M. S. May (1997)  
"Synthesis and Characterization of Thermally Crosslinkable Polyesters"  
Current location: Dow Corning, Midland, MI  
[www.linkedin.com/pub/elizabeth-pingel-mcquiston/b/a24/238](http://www.linkedin.com/pub/elizabeth-pingel-mcquiston/b/a24/238)

Shankarram Athreya, Materials Science and Engineering, M. S. June (1997)  
"Electronic Transport Properties of Protein Thin Films"  
Current location: Applied Materials, Santa Clara, CA  
[www.linkedin.com/pub/ram-athreya/1/952/ab4](http://www.linkedin.com/pub/ram-athreya/1/952/ab4)

Christopher J. Buchko, Materials Science and Engineering, Ph.D. August (1997)  
"Processing and Characterization of Protein Polymer Thin Films for Surface Modification of Neural Prosthetic Devices"  
Current location: Guidant, San Francisco, CA  
[www.linkedin.com/in/cbuchko](http://www.linkedin.com/in/cbuchko)

Tao Jiang, Materials Science and Engineering, M. S., (1994), Ph.D. August (1997)  
"Processing and Structure of Benzocyclobutene-modified Copolymers"

Dan Lawrence, Materials Science and Engineering, M. S. 1999  
"Microstructure of MPDI-co-XTA Copolymer Crystals"  
Current location: Flint Ink, Ann Arbor, MI  
[www.linkedin.com/pub/dan-lawrence/7/95/270](http://www.linkedin.com/pub/dan-lawrence/7/95/270)

Michael Johnson, Macromolecular Science and Engineering, Ph.D. 1999  
"Processing and Characterization of Genetically Engineered Polypeptides"  
Current location: Amgen, Thousand Oaks, CA.  
[www.linkedin.com/pub/mike-johnson/5/792/bb0](http://www.linkedin.com/pub/mike-johnson/5/792/bb0)

Joshua Rock, Materials Science and Engineering, M.S.,(not completed)  
"Monomer-Polymer Grain Boundaries in DCHD Diacetylene"  
Current location: Detroit, MI

Qian Li, Materials Science and Engineering, M.S, 1999  
"WBSXT of DCHD Polymerization"  
Current location: Chicago, IL

Lebzylisbeth Gonzalez, Macromolecular Science and Engineering, Ph. D. 2000, "Microstructure and Defects of Optoelectronically Active Bithiazoles and Bisoxazoles"

Current location: Lebzy Gonzalez Scientific Translations, Greater Boston Area, MA  
[www.linkedin.com/in/lebzy](http://www.linkedin.com/in/lebzy)

Houxiang Tang, Materials Science and Engineering, Ph.D. November 2001. “Near-Surface Microstructure and Deformation of Thermoplastic Blends”.  
Current location: Dow Chemical Company, Midland, MI.

Xinyan “Tracy” Cui, “Conducting Polymer Coatings for Biomedical Devices”, Macromolecular Science and Engineering, Ph.D. (2002).  
Current location: Associate Professor of Biomedical Engineering, University of Pittsburgh  
<http://www.engineering.pitt.edu/XinyanCui/>

Greg Hostetter, “Molecular Modeling of Structural Evolution in the PBO-Phosphoric Acid-Water Ternary System”, Materials Science and Engineering, M.S. (2002).  
Current Location: Advent Engineering, Ann Arbor, MI  
<http://www.adventengineering.com/advent/greg-m-hostetter.html>

Lawrence Drummy, “Defects in Semiconducting Organic Molecular Crystals”, Materials Science and Engineering, Ph.D. (2003).  
Current location: WPAFB, Dayton, OH  
[www.linkedin.com/pub/larry-drummy/10/61b/654](http://www.linkedin.com/pub/larry-drummy/10/61b/654)

Rick Vohden, “Nanoindentation of Electrospun Polymer Mats”, BME SGUS, (2003).  
[www.linkedin.com/pub/rick-vohden/14/24/578](http://www.linkedin.com/pub/rick-vohden/14/24/578)

Rebecca Northey, “Polymerization of Conducting Polymers in Surfactants”, Materials Science and Engineering and Macromolecular Science and Engineering, M.S. (2004).  
[www.linkedin.com/pub/rebecca-northey/4/902/262](http://www.linkedin.com/pub/rebecca-northey/4/902/262)

Donghwan Kim, “Hydrogel Coatings for Neural Prosthetic Devices”, Biomedical Engineering, Ph.D. (2005).  
Current location: Assistant Professor, Nanyang Technical University, Singapore  
[http://www3.ntu.edu.sg/scbe/bioe/FacultyPP/Profile\\_DHKIM.htm](http://www3.ntu.edu.sg/scbe/bioe/FacultyPP/Profile_DHKIM.htm)

David Lin, “Alignment in Electrospun Liquid Crystalline Polymers”, Macromolecular Science and Engineering, Ph.D., (2005).  
Current location: Becton-Dickinson, New Jersey  
<http://www.indeed.com/r/David-Lin/82270291ec0774c4>

Brian Birchler, “Characterization of PEDOT Electrochemical Polymerization on Large Electrodes”, SGUS in BME (2005).

Mohammad Abidian, “Biomaterials for the Central Nervous System”, Biomedical Engineering, Ph.D., March 2007.  
Current location: Assistant Professor, Penn State University, State College, PA  
<http://www.bioe.psu.edu/labs/Abidian-Lab/index.html>

Jihua Chen, “Structure, Processing, and Properties of the Organic Molecular Semiconductor Triisopropylsilyethyl (TIPS) Pentacene”, Macromolecular Science and Engineering, August 2007.

Current location: Oak Ridge National Laboratory, Oak Ridge, TN  
[www.linkedin.com/in/jihuac](http://www.linkedin.com/in/jihuac)

Jeffrey Hendricks, “Microstructure of Biopolymers on Neural Probes”, Biomedical Engineering, Ph.D., August 2008.

Current location: Director of Engineering, Biotectix LLC, Ann Arbor, MI  
[www.linkedin.com/pub/jeffrey-hendricks/16/49a/bb3](http://www.linkedin.com/pub/jeffrey-hendricks/16/49a/bb3)

Charles Shaw, “Organic Semiconductors”, Macromolecular Science and Engineering, Ph.D., expected 2011.

[www.linkedin.com/in/charlesmshaw](http://www.linkedin.com/in/charlesmshaw)

Michelle Leach, “Cubic Phase PEDOT”, Biomedical Engineering SGUS, December 2006.

Current location: Research Staff, Laboratory of Joseph Corey, MD, Neurology, University of Michigan.

[www.linkedin.com/in/michellekleach](http://www.linkedin.com/in/michellekleach)

Rickard Axelsson Liljemalm, “Mass Transport During Actuation of Poly(3,4-ethylenedioxythiophene) for Neural Drug Delivery Devices”, Linkopings University, Sweden. Student of Prof. Olle Inganäs, Co-advised during a visit to our laboratory from September, 2006-February 2007.

Current location: Ph. D. student in Biomedical Engineering and Neuroscience, Stockholm, Sweden

<https://www.facebook.com/rickard.liljemalm?fref=ts>

David Pinkney, “Polymerization of PEDOT in Surfactant Cubic Phases”, Biomedical Engineering SGUS, May 2007.

[www.linkedin.com/in/davidpinkney](http://www.linkedin.com/in/davidpinkney)

Matt Meier: “Polymerization of Conducting Polymers on Biomedical Devices”, Biomedical Engineering SGUS, May 2008.

[www.linkedin.com/pub/matt-meier/17/124/829](http://www.linkedin.com/pub/matt-meier/17/124/829)

Sarah Spanninga, “XPS studies of Glutamate-EDOT”, Macromolecular Science and Engineering, jointly advised with Prof. Zhan Chen, Ph. D, May 2010. Current location: Ann Arbor, MI.

[www.biotectix.com](http://www.biotectix.com)

Laura Povlich, “Functionalized EDOT and Melanin”, Macromolecular Science and Engineering, jointly advised with Prof. Jinsang Kim, Ph.D. estimated May 2011.

[www.linkedin.com/pub/laura-povlich/10/6a7/734](http://www.linkedin.com/pub/laura-povlich/10/6a7/734)

Jinghang Wu, “Structural Studies of Organic Semiconductors”, Macromolecular Science and Engineering, Ph.D. February 2011.

[www.linkedin.com/pub/jinghang-wu/24/472/1ba](http://www.linkedin.com/pub/jinghang-wu/24/472/1ba)

Norman Meznarich, “In-Vivo Polymerization of Conducting Polymers”, M. S. in Materials Science and Engineering. Currently working with Prof. Brian Love, Materials Science and Engineering, The University of Michigan.

Zhangqi Feng, “Electrospinning of Multiphase Polymer Fibers for Integration with Neural Cells”, Visiting Scholar, May 2010.

### ***Chulalongkorn University, Bangkok, Thailand***

Ying-anong Arthasart, “The Influence of Reprocessing on the Properties of High-Density Polyethylene (HDPE)”, M. S. Thesis, The Petroleum and Petrochemical College of Chulalongkorn University, Bangkok, Thailand, (1996). Co-advisor: Prof. Kanchana Trakulcoo

Kamolrat Thienthanawanith, “Reprocessing of Engineering Thermoplastics (Nylon 6,6, PEI, POM): Effects on Mechanical Properties”, M. S. Thesis, The Petroleum and Petrochemical College of Chulalongkorn University, Bangkok, Thailand, (1996). Co-advisor: Prof. Kanchana Trakulcoo

Surakit Chunharotrit, Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand, M.S. in Polymer Science, “Chitin Derivative for Controlled Release System”, ISBN 974-638-440-6, (1998). Co-Advisor: Suwabun Chirachanchai

Wanpen Tachaboonyakiat, Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand, M.S. in Polymer Science, “Chemical Modification of Chitin/Chitosan; An Approach for Processing Thermoplastic-Chitin Blend”, ISBN 974-638-442-2, (1998). Co-Advisor: Suwabun Chirachanchai

Watanaporn Pornsiripong, Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand, M.S. in Polymer Science, “Degradation of Starch-Based High Density Polyethylene Blends Containing a Prooxidant Additive”, ISBN 974-638-482-1, (1998). Co-Advisor: Ratana Rujiravanit

Thipa Naiyawat, Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand, M.S. in Polymer Science, “Studies on Rheology and Microstructure of Starch-Based HDPE Blends”, ISBN 974-638-480-5, (1998). Co-Advisor: Ratana Rujiravanit

Sawitree Petchuay, Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand, M.S. in Polymer Science, “Study on Mechanical Properties of Starch-Based HDPE Blends”, ISBN 974-638-481-3, (1998). Co-Advisor: Ratana Rujiravanit

Suppawat Suranakapan, Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand, M.S. in Polymer Science, “Processability and Mechanical Properties of



HDPE Film Containing Starch as a Filler”, ISBN 974-638-484-4, (1998). Co-Advisor: Ratana Rujiravanit

Amornrat Lertworasirikul, “Structurally Controlled Chitin Derivatives by Chemical Modification Approach: An Application of Insecticide Controlled Release”, Ph.D. in Polymer Science, Chulalongkorn University, Bangkok, Thailand, ISBN 974-331-915-8, Co-Advisor: Suwabun Chirachanchai

Harittapak Kiratisaevee, Petroleum and Petrochemical College, Chulalongkorn University, Bangkok, Thailand, M.S. in Polymer Science, “Degradation of HDPE/Starch Blends Containing Prooxidant, Autooxidant and Compatibilizers”, ISBN 974-334-170-6, (2000). Co-Advisor: Ratana Rujiravanit

Pattama Taepaiboon, “Quartz-Crystal Microbalance Studies of Polymer Nanofibers”, Chulalongkorn University, Petroleum and Petrochemical College, Advisor: Pitt Supaphol

### ***The University of Delaware***

Liangqi Ouyang, “In-Situ Polymerization of Conjugated Polymers in Living Tissue”, Ph.D. Dissertation in Materials Science and Engineering, expected May 2013

Jinglin Liu, “High Resolution Structural Characterization of Oriented Conjugated Polymers”, Ph.D. Dissertation in Materials Science and Engineering, expected May 2014

Jing Qu, “Nanoparticles of Natural and Synthetic Melanin”, Ph.D. Dissertation in Materials Science and Engineering, expected May 2014

Chin-Chen Kuo, “Cellular Interactions with Conjugated Polymers”, Ph.D. Dissertation in Materials Science and Engineering, expected May 2014

### **Undergraduate Research Students:**

#### ***The University of Michigan***

Ken Brown, Materials Science and Engineering  
Renee Ritchie, Materials Science and Engineering  
Bert Chien, Materials Science and Engineering  
John Anderson, Materials Science and Engineering  
Robert Ratway, Materials Science and Engineering  
John Buatti, Chemical Engineering  
Monica Little, Chemical Engineering  
Robert Kody, Mechanical Engineering  
Kim Trabbic, Materials Science and Engineering  
Gregory Zywicki, Materials Science and Engineering

Keith Abel, Materials Science and Engineering  
Matthew Stephen-Hassard, Materials Science and Engineering  
Raymond Flowers, Materials Science and Engineering  
Randy Logan, Materials Science and Engineering  
Rupak Rajachar, Materials Science and Engineering  
Neil Weissman, Materials Science and Engineering  
Sharon Henderson, Chemical Engineering  
Mary Manners, Materials Science and Engineering  
Jennifer Stewart, Materials Science and Engineering  
Bradley Ruitter, Chemical Engineering  
Ben Carter, Chemical Engineering and Materials Science and Engineering  
Jon Rowley, Materials Science and Engineering  
Atisa Shioshansi, Chemical Engineering  
Lawrence Oberti, Materials Science and Engineering  
Matthew Stevenson, Materials Science and Engineering  
Jeremy Foland, Chemical Engineering  
Adam Kopper, Materials Science and Engineering  
Ken Kozloff, Materials Science and Engineering  
Thomas Kriewall, Chemical Engineering  
Loui Chen, Chemical Engineering  
Julia Yeh, Materials Science and Engineering  
Maggie Slattery, Materials Science and Engineering  
Ken Moll, Materials Science and Engineering  
Sandra Murray, Materials Science and Engineering  
Judith Na, Materials Science and Engineering  
Aleks White, Materials Science and Engineering  
Paul Miska, Materials Science and Engineering  
Atori Achari, Materials Science and Engineering  
Richard Vohden, Materials Science and Engineering  
Lauren Pine, Materials Science and Engineering  
Michael Lee, Biomedical Engineering (UROP)  
Sakib Elahi, Biomedical Engineering (UROP)  
Yameen Mandania, LS&A (UROP)  
Nurem Lee, Engineering (UROP)  
David Alberts, Materials Science and Engineering (UROP)  
Sarah Poletta, Materials Science and Engineering  
Michael Pollina, Materials Science and Engineering  
Melissa McGinnis, Materials Science and Engineering  
Jennifer Hanson, Materials Science and Engineering  
Atul Gupta, Engineering (UROP)  
Douglas Berry, Physics (UROP)  
Karen Lipkin, Materials Science and Engineering  
Wynn Koehler, Materials Science and Engineering  
Matthew Meier, Biomedical Engineering  
Matthew Lapsley, Materials Science and Engineering (UROP)  
Tani Kahlon, Materials Science and Engineering (UROP)

Laura Povlich, Materials Science and Engineering (UROP)  
Chee Keong (Benjamin) Tee, Electrical Engineering and Computer Science (UROP)  
Michelle Leach, Biomedical Engineering (UROP)  
Mark Ferrall, College of Literature, Science and the Arts, (UROP)  
Clair Harris, College of Literature, Science and the Arts, (UROP)  
Cynthia Sequerah, Chemical Engineering (UROP)  
Matt Kominsky, College of Literature, Science and the Arts, (UROP)  
Wen Chung (Allan) Lim, Chemical Engineering (UROP)  
Eric Tannebaum, College of Literature, Science and the Arts, (UROP)  
Deepa Rengaraj, Materials Science and Engineering, (UROP)  
Amber Brannan, Applied Biology, Rose-Hulman Institute of Technology, Indiana (NNEU)  
Catherine Burk, Biomedical Engineering (UROP)  
Kyle Roebuck, Biomedical Engineering (UROP)  
Jingga Morry, Materials Science and Engineering  
Brian Foster, Materials Science and Engineering (UROP)  
Elizabeth Flak, Materials Science and Engineering  
Sejal Tailor, Biomedical Engineering (UROP)  
Kate Gallup, Materials Science and Engineering  
Alfred Lim, Electrical Engineering and Computer Science  
Beneque Cousin, Materials Science and Engineering (UROP)  
Daniel Margul, Biomedical Engineering  
Grace Hu, Materials Science and Engineering  
Chelsea Haughn, Materials Science and Engineering  
Caroline Dove, Materials Science and Engineering  
Andrew Sereno, Materials Science and Engineering  
Jonathan Wang, Materials Science and Engineering  
Behnaz Jarrahi, Biomedical Engineering  
Ye Shen, Biomedical Engineering  
Zachary King, Biomedical Engineering

### ***The University of Delaware***

Yusaf Hussein, Biological Sciences  
Michelle Dee, REU Student, Chemical Engineering, University of Southern California  
Evan Philips, Mechanical Engineering  
Chengyi Han, Chemical Engineering  
James Manning, Biomedical Engineering  
Rami Sharma, Mechanical Engineering  
Stacy Hand, Biomedical Engineering  
Brendan Farrell, Biomedical Engineering  
Unnati Patel, Biomedical Engineering

### **High School Students**

### ***The University of Michigan***

Daniel Lee, Connecticut, NASA/Sharp Program 2000  
Sylvia Johnson, Georgia, NASA/Sharp Program 2001  
Deborah Chen, Connecticut, NASA/Sharp Program 2002  
Jayne Choi, Greenhills High School, Ann Arbor, MI, Materials Science outreach program coordinated by Prof. Rachel Goldman, Summer 2005  
Peter Keshtkar, Greenhills High School, Ann Arbor, MI, Materials Science outreach program, Summer 2006  
Max Betzig, Greenhills High School, Ann Arbor, MI, Materials Science outreach program, coordinated by Prof. Rachel Goldman, Summer 2006  
Dan Miller, Greenhills High School, Ann Arbor, MI, Materials Science outreach program, Summer 2007  
Andre Pegeron, Greenhills High School, Ann Arbor, MI, Materials Science outreach program, Summer 2007  
Laurence King, Greenhills High School, Ann Arbor, MI, Materials Science outreach program, Summer 2008  
Hyunsoo Chung, Greenhills High School, Ann Arbor, MI, Materials Science outreach program, Summer 2008

### **Theses:**

"Direct Imaging of Deformation and Disorder in Extended-Chain Polymers",  
**Ph.D. Dissertation**, Polymer Science and Engineering, The University of Massachusetts at Amherst, February 1990.

"Thermodynamic and Mechanical Characterization of Damage Development in Thermoplastics", **Master's Thesis**, Macromolecular Science and Engineering, Rackham Graduate School, The University of Michigan, July 1985.

### **Publication Editing:**

Editorial Board:2004-present  
Acta Biomaterialia (Elsevier)

Editor: Special Issue on Defects in Polymers  
MRS Bulletin: September 1995

Book Review Editor: Polymer Chemistry and Biomaterials  
MRS Bulletin 2004-2006

Editorial Board:2000-2001  
MRS Bulletin

Editor: Special Issue on Polymer Microscopy  
Polymer: 1995

Primary Editor: David C. Martin, David A. Muller, Paul A. Midgley, and Eric A. Stach, *Electron Microscopy of Molecular and Atom-Scale Mechanical Behavior, Chemistry, and Structure*, Materials Research Society Symposium Proceedings, Volume 839, Materials Research Society, Warrendale, PA, (2005).

## **Publications:**

Citation metrics:

H-index: 43; i10 index: 108 (as of July 2, 2013; per Google Scholar)

m: H / years since Ph.D. degree:  $(43/(2013-1990)) = 1.83$

h-index: 39 (as of July 2, 2013; per ResearcherID.com)

m: H / years since Ph.D. degree:  $(39/(2013-1990)) = 1.70$

Theodore A. Kung, Nicholas B. Langhals, David C. Martin, Paul S. Cederna, and Melanie G. Urbanek, "Regenerative Peripheral Nerve Interface Viability and Signal Transduction with an Implanted Electrode", **Plastic and Reconstructive Surgery**, in preparation.

Whirang Cho, "Bicontinuous PEDOT", submitted for consideration to **Macromolecules**, (2013).

157. Charles M. Shaw, Xinnan Zhang, Lidaris San Miguel, Adam J. Matzger, and David C. Martin, "Synthesis and structure of alpha-substituted pentathienoacenes", **Journal of Materials Chemistry C**, 1, 3686-3694, (2013). <http://dx.doi.org/10.1039/C3TC30144C>

156. Zhang-Qi Feng, Jinghang Wu, Whirang Cho, Michelle K. Leach, Eric W. Franz, Youssef I. Naim, Zhong-Ze Gu, Joseph M. Corey, and David C. Martin, "Highly Aligned Poly(3,4-ethylene dioxythiophene) (PEDOT) Nano- and Microscale Fibers and Tubes", **Polymer**, 54(2), 702-708, (2013). <http://dx.doi.org/10.1016/j.polymer.2012.10.057>

155. Laura K. Povlich, Jae Cheol Cho, Michelle K. Leach, Jinsang Kim, Joseph M. Corey, and David Charles Martin, "Synthesis, Copolymerization, and Peptide-Modification of Carboxylic Acid-Functionalized 3,4-ethylenedioxythiophene (EDOTacid) for Neural Electrode Interfaces", Special Issue on Organic Bioelectronics--Novel Applications in Biomedicine, **Biochimica et Biophysica Acta (BBA)--General Subjects**, 1830(9), 4288-4293, (2013). <http://dx.doi.org/10.1016/j.bbagen.2012.10.017>

154. Ziya Baghmanli, Kristoffer B. Sugg, Benjamin Wei, Bong S. Shim, David C. Martin, Paul S. Cederna, and Melanie G. Urbanek, "Biological and Electrophysiological Effects of Poly(3,4-ethylenedioxythiophene) on Regenerating Peripheral Nerve Fibers", **Plastic and Reconstructive Surgery**, Manuscript PRS-D-12-01182, in press, (2012).

153. Kathleen Feldman and David C. Martin, "Functional Conducting Polymers via Thiol-ene Chemistry", **Biosensors**, 2(3), 305-317, (2012). <http://dx.doi.org/10.3390/bios2030305>

152. Yue Wang, Jinglin Liu, Henry D. Tran, Matthew Mecklenburg, Adam Z. Stieg, Xin N. Guan, B. C. Regan, David C. Martin, and Richard B. Kaner, "Morphological and dimensional control via hierarchical assembly of doped oligoaniline single crystals", **Journal of the American Chemical Society**, 134(22), 9251-9262, 2012. <http://dx.doi.org/10.1021/ja301061a>
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David C. Martin, “In-situ Polymerization of Conjugated Polymers for Communication Across the Reactive Layer Around Implanted Electrodes”, Ystad, Sweden, Brain-Machine Interfaces, August 2010

David C. Martin, “Microscopy of Materials at the Device—Electrode Interface”, Microscopy Society, Portland, OR 2010

David C. Martin, University of Delaware, “Materials for Interfacing Bionic Devices with Living Tissue”, Karl W. and Renate Boer Chaired Professorship Lecture, May 2010

David C. Martin, “Conjugated Polymers for Interfacing Biomedical Devices with Living Tissue”, A. I. du Pont Cancer Institute, May 2010

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David C. Martin, “Conjugated Polymers for Interfacing Electronic Biomedical Devices with Living Tissue”, University of Delaware Materials Research Society Symposium, Fall 2009

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David C. Martin, “Conjugated Polymers for Interfacing Electronic Biomedical Devices with Living Tissue”, University of Pennsylvania Materials Science and Engineering Department, February 2010

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DCM, Utah ACS, Spring 2009

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DCM, Neuroprostheses Conference, Polymers for Integrating Biomedical Devices in Living Tissue, Cleveland, OH, June 2008

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DCM et al, MRS Spring Meeting, March 2008

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David C. Martin, “Conducting Polymers Interacting with Tissue”, Electrochemical Meeting in Wollongong, Australia, February 2007.

David C. Martin, “Conducting Polymers for Integrating Devices with Tissue”, University of Utah, September 2006.

David C. Martin, “Integrating Biomedical Devices with Living Tissue”, Medtronic Research Forum, Medtronic, Minneapolis, MN, April 28, 2006 (invited).

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David C. Martin, "Interfacing Biomedical Devices with Tissue using Conducting Polymers", Saginaw Valley chapter of ASM International, Frankenmuth, MI, April 2006.

David C. Martin, "Defects and Deformation in Organic Semiconductors", Dow Chemical Company, April 2006 (invited).

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David C. Martin, “Nanostructured Conducting Polymers for Interfacing Electronic Devices with Living Tissue”, KOSEF ERC on NanoBioelectronics and Systems Research Center, Seoul National University, Seoul, Korea, February 10, 2006 (invited).

David C. Martin, “Nanofibrous Conducting Polymers for Interfacing Biomedical Devices with Living Tissue”, Inje University Presidential Seminar, Inje University, Busan, Korea, February 8, 2006 (invited).

David C. Martin, “Nanostructured Polymer Fibers for Interfacing Biomedical Devices with Living Tissue”, Intelligent Textiles Research Institute, First International Conference, Seoul National University, Seoul, Korea, February 6, 2006 (invited).

David C. Martin, “Nanostructured Drug Delivery Coatings for Neural Prosthesis”, Materials Research Society, Boston, MA, December 2005 (invited).

David C. Martin, “Polymers for Interfacing Electronic Devices with Living Tissue”, American Chemical Society, Dow Chemical Company, Midland, MI, October 2005 (invited).

David C. Martin, “Defects in Organic Molecular Thin Films”, NIST, Gaithersburg, MD, June 2005 (invited).

David C. Martin, “Electrochemical Polymerization Around Living Cells”, NASA Conference, University of Michigan, February 2005, (invited).

David C. Martin, “Soft Polymer Coatings for Neural Probes”, Neural Prosthesis Workshop, Bethesda, MD, November 2004, (invited).

David C. Martin, “Defects and Deformation in Organic Molecular Semiconductors”, University of Wisconsin, November 2004 (invited).

David C. Martin, “Soft, Biocompatible Coatings for Neural Prosthetic Devices”, Duke University, September 2004 (invited).

David C. Martin, “Fuzzy Polymer Coatings for Mechanics and Sensing”, DARPA Minisymposium, The University of Michigan, July 2004 (invited).

David C. Martin, “Fuzzy Polymer Surfaces for Interfacing Microfabricated Devices with Living Tissue”, Eye and the Chip, June, 2004 (invited).

Jihua Chen, David C. Martin, and John Antony, “Thin Film Morphology and Crystal Structure of TIPS Pentacene”, American Physical Society, R1.036, Montreal, Quebec, Canada, March 2004.

David C. Martin, “Macromolecular Nanotechnology”, MIT Symposium on Nanotechnology, Compuware Center, Detroit, MI, January 2004 (invited).

David C. Martin and Patrick A. Tresco, “Biomaterials for the Central Nervous System”, Neural Prosthesis Workshop, Bethesda, MD, October 2003 (invited).

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David C. Martin, “Soft, Bioactive, Electronically Conducting Surface for Interfacing with Living Neural Tissue”, The University of Pittsburgh, October 2003 (invited).

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David C. Martin, “Elastica Bend Testing of the Effective Interfacial Shear Strength and Critical Deformation Strains of Brittle Coatings on Ductile Substrates”, Athens Coatings Conference, Athens, Greece, July 2002 (invited)

David C. Martin, “Fuzzy Polymer Coatings for Neural Prosthetic Devices”, ACS Regional Meeting, Ypsilanti, MI, June 2002 (invited)

David C. Martin, “Deformation of Brittle Painted Coatings on Ductile TPO Substrates”, Focus Conference, MSU Conference Center, Troy, MI, May 2002 (invited)



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Jun Liao and David C. Martin, "Synchrotron WAXS of Polydiacetylene Phase Transformation", American Physical Society, (1996).

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David C. Martin, Patricia M. Wilson, Jun Liao, Lebylizbeth Gonzalez, "Microstructure and Macroscopic Properties of Defects in Optoelectronically Active Polymers", Macromolecular Science and Engineering Center Annual Symposium, October 19, 1995 (invited).

David C. Martin, "Thernally Crosslinkable Aromatic Poly(amides)", Gordon Research Conference, Polymers, New England College, Henniker, NH, June 1995 (invited).

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David C. Martin, "Intermolecular Twist Defects in Extended-Chain Polymers", in Proceedings of the Mini-symposium on Computational Materials Science, edited by Ruth Pachter, Wade Adams, and Barry L. Farmer, WL-TR-95-4008, September (1994).

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### **Workshops and Short Courses:**

Polymer Physics, The Petroleum and Petrochemical College of Chulalongkorn University, Bangkok, Thailand, Offered: August 2005. Co-instructor: Prof. Anuvat.

Polymer Physics, The Petroleum and Petrochemical College of Chulalongkorn University, Bangkok, Thailand, Offered: August 2004. Co-instructor: Prof. Anuvat.

Polymer Processing, The Petroleum and Petrochemical College of Chulalongkorn University, Bangkok, Thailand, Offered: July 1998. Co-instructor: Prof. Rathanawan

Polymer Processing, The Petroleum and Petrochemical College of Chulalongkorn University, Bangkok, Thailand, Offered: August 1996. Co-instructor: Prof. Suwabun Chirachanchai

Polymer Microscopy: Division of High Polymer Physics, American Physical Society. Offered: March 1995. Associated staff: Robert Cieslinski (Dow Chemical), Duane Krueger (Dow Chemical), Deborah Vezie (Gilette), Karen Winey (U. Penn.), Gregory Meyers (Dow Chemical)

Polymer Processing, The Petroleum and Petrochemical College of Chulalongkorn University, Bangkok, Thailand, Offered: August 1994. Co-instructor: Prof. Kanchana Trakulcoo

Polymer Microscopy, The University of Seoul, Seoul, South Korea. Offered: March 1994. Associated staff: Changmo Sung (U. Mass. at Lowell), Deborah Vezie (U. S. Air Force and U. S. Army).

Polymer Microscopy, The University of Michigan, Engineering Conferences program.

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### **Technical Reports:**

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David C. Martin and K. Sue O' Shea, "Surface Modification for Biocompatibility", Quarterly and Final Progress Reports, National Institute of Health, Bethesda, MD, (1995-1998).

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