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Department at a Glance

Tenure and tenure-track faculty: 12
Number of undergraduate students enrolled (as of fall 2006): 266
Number of graduate students enrolled (as of fall 2006): 42
Total number of students enrolled (as of fall 2006): 308
BS degrees awarded: 43
MS degrees awarded: 4
PhD degrees awarded: 7
Publications: 40
New research awards: $4,468,155
Research expenditures: $2,005,784

CBE participants and advisors of the COE Senior Design Group Competition (from left to right) Colleen Mackey, Michael Matt, Prof. Giuseppe Palmese, Nicole Gallante, Prof. Richard Cairncross, and Thomas Salerno. See the story on page 14.
Message from the Department Head

Dear Friends,

Welcome to CBE! This past year the department has seen significant growth that I would like to share with you. We have had a continued increase in undergraduate and graduate enrollment, a new bio-track was offered to undergraduates, a record seven students received their PhD, Kenneth Lau (MIT) was welcomed to the department as an assistant professor, Prof. Elabd received a NSF CAREER award, and our faculty enjoyed high levels of productivity and recognition.

In response to the growing demand for chemical engineers in bio-related fields, and to broaden the educational opportunities of our undergraduates, a bio-track was added to our curriculum. The effort was spearheaded by Prof. Wrenn (Associate Department Head). Students completing the program, which is comprised of 23.5 credits, will constitute a new generation of engineers that speak the language of biology, yet remain true to the process intensive nature of chemical engineering.

The department continues to be dedicated to multi-disciplinary research at the highest level. This year marks the first full year of activity for the Drexel-ARL Army Materials Center of Excellence (MCOE) that highlights a multi-investigator approach to solving complex multiscale challenges in the design of polymeric materials. Additional multi-investigator grants were awarded to our faculty this year. They include a USDA/DOE grant headed by Prof. Cairncross for the improvement of bio-based polymers, and Prof. Elabd’s participation in a MURI for developing high performance membranes using ionic liquids. Further details of these and other new efforts that showcase our dedication to research are detailed in the pages that follow. This past year our research expenditures reached $2 million and the faculty published 40 articles in major journals.

This report also summarizes the development of our faculty. During this year, Prof. Lowman was promoted to full professor, Prof. Dan returned from her sabbatical at Harvard University where she focused on microfluids, and Prof. Wrenn received a Humboldt research fellowship that took him to Ruhr University in Bochum, Germany. This year Professor Grossmann retired after 55 years of service to the department and was awarded the rank of professor emeritus of chemical engineering. Other exciting news includes Professor Mutharasan’s recognition when his work regarding pathogen sensors received media coverage during the E. coli outbreak of 2006. His work was featured in the Philadelphia Inquirer, LA Times, and ABC News.

As you can see, this has been an exciting and productive year for our department. We are looking forward to adding to this growth next year and I hope you will enjoy the report.

Best wishes,

[Signature]
The Department Welcomes Kenneth Lau

The department welcomed Kenneth Lau to the department in September, 2006 as an assistant professor after several years of postdoctoral research at the Massachusetts Institute of Technology. He earned his Ph.D. in chemical engineering from the Massachusetts Institute of Technology in 2000, where he worked with Prof. Karen K. Gleason on the chemical vapor deposition of polymer thin films and coatings. At MIT, Ken was awarded a fellowship in the program in polymer science and technology and he also had the opportunity to help start up a company, GVD Corporation, related to his research work. He obtained his B.Eng. in chemical engineering with first class honors from the National University of Singapore in 1995. At NUS, Ken was selected for an overseas internship with Mobil Oil Corporation in Joliet, IL during his junior year, and he was awarded, among many other college prizes and medals, the Mobil Gold Medal as the top chemical engineering student in his senior year at NUS. While Ken is originally from Hong Kong, he grew up spending his formative years not only in Hong Kong, but also in Taiwan and Singapore, receiving education from both American and British schools. Ken has been passionate about research since the start of college, with at least 20 journal publications and one patent pending to date. He was recently invited to present at the 4th International Conference on Hot-Wire (Cat-CVD) Process in Takayama, Japan, and also at the Hong Kong University of Science and Technology. His current research interests are in the area of polymer thin films and coatings for nanoscience and nanotechnology, especially in the fields of biomedicine and energy and the environment. His latest work has been looking at initiated chemical vapor deposition methods to create enteric coatings for controlled drug release. Outside of research, Ken likes to play tennis and volleyball and go for the occasional run. He also has a passion for music and plays the piano. He is actively involved with the Salvation Army, helping to reach out to the disadvantaged.

Prof. Richard Cairncross received the prestigious L.E. Scriven Young Investigator Award at the International Coating Science and Technology (ICST) Symposium on September 11, 2006. Prof. Cairncross received this award for fundamental, theoretical, and experimental contributions to coating science, including physico-chemical behavior, flow prediction, and numerical modeling, and service as an educator and mentor. Along with receiving this award, Prof. Cairncross also served as chair for the ICST symposium.

Prof. Anthony Lowman was recently promoted to professor for his continued commitment to Drexel University and exceptional quality of research. Prof. Lowman joined the CBE department in 1997 after completing his Ph.D. in chemical engineering at Purdue University. Prof. Lowman’s research focus is in the areas of controlled drug delivery, tissue engineering, biomaterials, and polymer science and engineering. He also serves the Drexel community as a graduate committee member and the coordinator for the B.S./Ph.D. program.

Prof. Raj Mutharasan & Prof. Anthony Lowman were inducted as fellows of the American Institute for Medical and Biological Engineering (AIMBE) on March 1, 2007. AIMBE, based out of Washington, D.C., was founded in 1991 to help “bridge the gap between the field of medicine and biological engineering.” Aside from this honor, in 2001, Prof. Mutharasan became honored as a fellow for the American Institute of Chemical Engineers (AIChe). Prof. Mutharasan is the second in the history of the department of chemical and biological engineering to receive this honor.

Prof. Giuseppe Palmese was given the Technical Cooperation Program Achievement Award on June 18, 2007 from the Department of Defence. The award is for significant contribution to collaborative research in the area of electron beam curing of polymers and advanced composite materials, including fundamental curing mechanisms, characterization techniques and modeling tools. The result is a substantial advance in the state of the art of this important new manufacturing technology that is expected to result in new capabilities and lower cost for new defense platforms and repair of existing platforms.
Dr. Elihu Grossmann Celebrates Retirement

After serving 55 years in Drexel University’s department of Chemical and Biological Engineering, Prof. Elihu Grossmann celebrated his retirement on September 18, 2006. Prof. Grossmann’s career at Drexel is the longest continuous teaching career recorded in the university’s history.

Prof. Grossmann’s other notable accomplishments while teaching at Drexel University include: winning the first external research grant, becoming the youngest Drexel professor, being tenured after only five years, and initiating the first graduate program in Chemical Engineering.

Prof. Grossmann’s research contributions include: the design of a permanent lunar station, nanotube discovery through plasma processing for monomer recovery, thermodynamic analysis research, and cellulose hydrolysis research with Prof. Raj Mutharasan.

George Rowell, visiting associate professor, celebrated 35 years of service to Drexel University.

Dorothy Porter, office manager, celebrated 25 years of service to Drexel University.

Dan Luu, laboratory coordinator, celebrated 20 years of service to Drexel University.
New Grants Awarded

PI: CAMERON ABRAMS
Title: Acquisition of a High Performance Beowulf Computer Cluster for Polymeric Materials Simulation
Source: ARO
Total Funding: $120,000

PI: GIUSEPPE PALMESE
Title: Reformation project
Source: Benjamin Franklin Tech Partners
Total Funding: $13,200

PI: MASOUD SOROUSH
Title: GOAL: New generation of acrylic resins produced through spontaneous thermal polymerization
Source: NSF
Total Funding: $99,253

PI: RAJ MUTHARASAN
Title: Robust Cantilever Sensors for Detecting Pathogens in Drinking Water
Source: EPA
Total Funding: $562,215
Duration: 9/1/2006-12/31/2009

PI: RAJ MUTHARASAN
Title: An integrated research and education program on highly sensitive and sensitive biosensors for food born pathogens and toxins.
Source: United States Department of Agriculture
Total Funding: $527,150
Duration: 9/15/2006-9/14/2007

PI: RAJ MUTHARASAN
Title: Rapid assay of biomarkers in urine for point-of-care applications
Source: Pennsylvania Department of Health
Total Funding: $85,177

PI: RICHARD CAIRNCROSS
Title: Moisture management in polylactide and polylactide copolymers
Source: USDA-DOE
Total Funding: $1,312,389
Duration: 12/18/2006-12/17/2009

PI: YOSSEF ELABD
Title: MURI: Ionic Liquids in Electro-Active Devices (ILEAD)
Source: ARO
Total Funding: $950,000
Duration: 11/2007-10/2013

PI: YOSSEF ELABD
Title: CAREER: Multicomponent transport in polymer electrolyte membranes
Source: NSF
Total Funding: $467,899
Duration: 2/1/2007-1/31/2012

PI: YOSSEF ELABD
Title: Highly selective ionic block copolymer membranes
Source: ARO
Total Funding: $325,872

PI: YOSSEF ELABD
Title: 2007 MRS Symposium: Emerging materials for international security and defense applications
Source: ARO- DNI
Total Funding: $5,000
Duration: 8/13/2007-8/12/2008

Prof. Raj Mutharasan, of the department of chemical and biological engineering, was awarded $562,215 from the U.S. Environmental Protection Agency to research the detection of pathogens in drinking water without the need of a filtration step. Prof. Mutharasan and his research group will use the piezoelectric-excited millimeter-sized mechanically robust cantilever sensor to test samples of water spiked with various concentrations of pathogens. This will help characterize sensor response to the levels of pathogens in the water.
**Prof. Cairncross Awarded USDA/DOE Biomass Research Grant**

Professor Cairncross received a $1.3 million research and development grant from the U.S. Department of Agriculture (USDA) and the U.S. Department of Energy (DOE) on Wednesday, November 8th, 2006. The grant is part of $17.5 million awarded to 17 biomass demonstration, research, and development projects.

According to the DOE, Drexel CBE will use the grant to "improve bio-based polymers for moisture barrier applications."

Professor Cairncross's research initiative is entitled "Moisture Management in Polylactide and Polylactide Copolymers." The project's principal investigators are Richard Cairncross, Giuseppe Palmese, and Yossef Elabd in chemical and biological engineering at Drexel, Shri Ramaswamy in biobased products at University of Minnesota, and Marc Hillmyer in chemistry at University of Minnesota.

**Prof. Yossef Elabd Receives $7.5M MURI Award**

The Army Research Office has awarded Yossef A. Elabd a $7.5 million Multi-University Research Initiative (MURI) grant in conjunction with other scientists from lead institution Virginia Tech and partner universities including University of Pennsylvania and The Pennsylvania State University. The project, "Ionic Liquids in Electro-Active Devices (ILEAD)," will focus on developing electromechanical devices and high-performance membranes using ionic liquids. This research will have an impact on applications, such as fuel cells, smart fabrics, and artificial muscles. Industrial collaborators include DuPont, IBM Almaden, Kraton Polymers, NexGen Aeronautics, BASF, and Discover Technologies. This grant is a 5-year project where Drexel’s portion is $950K.

**Prof. Palmese heads $6.75 million ARL grant**

Drexel University’s College of Engineering was awarded a U.S. Army Materials Center of Excellence for research on polymers by the U.S. Army Research Laboratory. This is a cooperative program for $6.75M over a period of nine years headed by Giuseppe Palmese, professor and head of the Chemical and Biological Engineering Department. Co-PIs of this effort are Cameron Abrams, Joe Elabd, and Chris Li. The center proposal focused on multiscale synthesis, modeling, and design of advanced polymer systems and included projects on nanopore-filled systems, encapsulated nano- and meso-fiber mesh composites, hyperbranched polymers for segmented polyurethanes, ionically self-healing polymer systems, and computational modeling.
Prof. Steve Wrenn was awarded the Humboldt Research Fellowship from the Alexander Von Humboldt Foundation for the 2006-2007 academic year in Bochum, Germany. There, he worked alongside Prof. Georg Schimtz on a project entitled “Interactions of Ultrasound with Cholesterol Nanodomains in Lipid Membranes” at Ruhr University. The focus of the research looks at how ultrasound waves interact with membranes for applications such as wound healing and drug delivery, and specifically, which acoustic waves create holes in membranes.

Prof. Wrenn’s history with the fellowship started several years ago when he began collaborating with Prof. Peter Lewin, professor in the department of biomedical engineering. The pair received the Drexel Synergy Grant and the “Twinning with Poland” grant from the National Research Council. This grant allowed Prof. Wrenn to travel to the Polish Academy of Sciences – Institute for Ultrasound Research in Warsaw Poland for the joint German – Poland Biomedical Ultrasound Conference. While there he met the team from Ruhr University and was nominated by this team and later encouraged to apply for the Humboldt Research Fellowship.
Research

Cameron F. Abrams
PhD, University of California-Berkeley
multiscale molecular simulations, polymer thermodynamics, molecular and cellular biophysics

Jason B. Baxter
PhD, University of California – Santa Barbara
solar cells, nanowires

Richard A. Cairncross
PhD, University of Minnesota
effects of microstructure on transport in polymers, biodegradable polymers, transport modeling

Nily R. Dan
PhD, University of Minnesota
gene and drug delivery, polymer nano-composites, complex fluids

Yossef A. Elabd
PhD, Johns Hopkins University
fuel cells, polymer membranes, diffusion in polymers, electrocatalysts

Elihu D. Grossmann
PhD, University of Pennsylvania
pyrolysis of polymers, nanotube synthesis, safety analysis

Kenneth K.S. Lau
PhD, Massachusetts Institute of Technology
surface science, nanotechnology, polymer thin films and coatings, chemical vapor deposition

Anthony M. Lowman
PhD, Purdue University
biomaterials, drug delivery, hydrogels

Raj Mutharasan
PhD, Drexel University
biochemical engineering and biosensors

Giuseppe R. Palmese
PhD, University of Delaware
reacting polymer systems, nanostructured polymers, materials from renewable sources, composites and interfaces

Masoud Soroush
PhD, University of Michigan
process systems engineering, polymer engineering, modeling simulation

Charles B. Weinberger
PhD, University of Michigan
suspension rheology, fluid mechanics of multi-phase systems

Steven P. Wrenn
PhD, University of Delaware
biomedical engineering, biological colloids, intercellular phase separation and mass transfer

Donald R. Coughanowr, Professor Emeritus
Stephen P. Meyer, Assistant Department Head
George Rowell, Visiting Associate Professor
John T. Tallmadge, Professor Emeritus
John R. Thygeson, Professor Emeritus
2006–2007 Graduates

PHD Graduates

Ehsan Jabbarzadeh♦
Advisor: Cameron Abrams
Dissertation: “Theoretical and Experimental Approaches to Control Blood Vessel Growth into Tissue Engineered Scaffolds”

Angela Leung
Advisor: Raj Mutharasan
Dissertation: “Detection of Cells, Proteins, and DNA using Tapered Fiber-Optic Biosensors”

Erik D. Perakslis
Advisor: Anthony Lowman
Dissertation: “Determination of the in vitro and in vivo Oral Drug Delivery Capabilities of Complexation Hydrogels”

Felix Rantow
Advisor: Masoud Soroush
Dissertation: “Mechanistic Modeling and Model-Based Studies in Spontaneous Solution Polymerization of Alkyl Acrylate Monomers”

Kishan Rijal♦
Advisor: Raj Mutharasan
Dissertation: “Use of Piezoelectric-Excited Millimeter-Sized Cantilever (PEMC) Sensors for DNA-Based Detection of Pathogens and Disease Conditions”

Kevin Towles
Advisor: Nily Dan
Dissertation: “Modeling and Experimental Approaches for Investigating Lipid Bilayer Heterogeneity”

Jennifer Vernengo
Advisor: Anthony Lowman
Dissertation: “Injectable Hydrogels for Nucleus Pulposus Replacement and Repair of the Damaged Intervertebral Disc”

♦ Winners of Best Doctoral Dissertation

MS Graduates

Samuel Laurencin, Advisor: Anthony Lowman
Vivek Marella, Advisor: Giuseppe Palmese

Karri Momyer, Advisor: Anthony Lowman
Joshua Snyder, Advisor: Yossef Elabd

Ehsan Jabbarzadeh
Karri Momyer
Erik D. Perakslis
Jennifer Vernengo

Kevin Towles
Angela Leung
BS Graduates

Akinwole Akinfenwa
Erik Amrine**
Dwight Ashleigh
Seyma Aslan**
Daniel Avery
Christopher Barnes
Adam Burger
Bryan Daehnke**
Dustin Dam
Nicole Galante
Jimmy George*
Sara Goldberg
Francis Haas *** (2nd Honors)

Isabelle Harroch
Adam Histed
Sean Hutchinson
Stephen Johnson*
Alisa Kanjanakorn
Michael Keefe
Matthew Losch**
Ian Lutz*
Waiyun Ma
Colleen Mackey
Sean Manzano
Michael Matt
Lawrence Matthews

Helen Melito***
Krystle Nagle
Michael Ocbo
Rosine Passo
Devang Patel*
Amy Peterson*
I. Orion Pullman
Nicole Rantz
Gregory Rothsching*
Thomas Salerno*** (1st Honors)
Joshua Snyder**
Anthony Stellerine*
Ray Stoflet

Stephen Tomczewski
Stephen Tucker
Farrah Valentine
Michael Venezian

* Cum Laude
** Magna Cum Laude
*** Summa Cum Laude

Annual Report 2006-2007
Honor’s Day Award Recipients

NSF Integrative Graduate Education Research Traineeship Program (IGERT) Fellowships
Tony Tuesta

NASA Graduate Student Researchers Program Fellowship
Mary Sullivan

Department of Education GAAN Fellowship
Kara Spiller

NSF Integrative Graduate Education Research Traineeship Program (IGERT) Fellowships
Dan Hallinan
Amy Peterson

GAAN Fellow
Kevin Towles

Koerner Family Fellowship
Nick Deluca

NSF-GK12 Fellowship
Noelle Comolli

George Hill Jr. Endowed Fellowship
Ehsan Jabbarzadeh

GAAN Fellow
Angela Brown

February 21, 2007
Awards & Recognition

AIChE 2007 Ziesberg Award for Outstanding Laboratory Report  Thomas Salerno

BS/MS student under the direction of Dr. Giuseppe Palmese, was awarded second place in the graduate student category at ARL’s first Summer Student Research Symposium  Joe Stanzione

Cichowicz Graduate Student Poster Award for her poster titled “Synthesis and Characterization of Novel Injectable Hydrogels for Nucleus Pulposus Replacement.”  Jennifer Vernengo

William Penn Memorial Graduate Student Award for his poster titled “The Oral Delivery of Insulin Using Protein Conjugates in Complexation Hydrogels.”  Anthony Tuesca

2007 American Society for Composites Ph.D. Research Scholarship  Aflal M. Rahmathullah

Elias Klein Travel Award ($500) to attend the North American Membrane Society (NAMS) Annual Meeting  Nick DeLuca

COE Graduate Research Excellence Award  Dan Hallinan

COE Graduate Research Excellence Award  Aflal Rahmathullah

NSF Bridge to Doctorate Fellowship  Samuel Laurencin

Student finalist for the Society for the Advancement of Material and Process Engineering (SAMPE) Student Research Symposium.  Mary Sullivan

2007 Society for the Advancement of Material and Process Engineering (SAMPE) winner.  Jihean Lee

Guest Speaker at 81st Colloid & Surface Science Symposium  Mike Walters

Schering-Plough Research Travel Grant to AIChE ($2000)  Dan Hallinan
SAMPE Symposium Winners

Jihean Lee, a Ph.D. candidate advised by Prof. Giuseppe Palmese, was selected as the 2007 SAMPE winner. Jihean was also given the opportunity to speak about part of her research, “Influence of water on the kinetics of cationically photo-initiated polymerization of epoxy systems via electron beam irradiation.” A short talk was given during the student competition, but she was given the opportunity to give an extended presentation during the main section of the conference. Every year SAMPE (Society for the Advancement of Material and Process Engineering) holds a student competition. Finalists are given the opportunity to participate in the International SAMPE Symposium in Long Beach, California and present their work. The winner is selected based on leadership, scholarship, innovative ability in research and capability in curricular affairs, activity in student and community affairs, communicative skills, and growth potential. Then, one PhD student is chosen to represent the USA in the European conference.

Mary Sullivan, under the direction of Prof. Giuseppe Palmese, was selected as a student finalist for the Society for the Advancement of Material and Process Engineering (SAMPE) Student Research Symposium. All finalists selected were invited to present their research at the SAMPE International Conference in Baltimore, MD on June 3, 2007. Mary won a cash award for her presentation, “Design of Nanoporous Polymer Composites with Functionalized Carbon Nanotubes” in the Ph.D. category.

Mike Walters Guest Speaks at 81st Colloid & Surface Science Symposium

Mike Walters, a PhD student under Prof. Steven Wrenn, spoke at the 81st Colloid & Surface Science Symposium of the American Chemical Society at the University of Delaware on June 27, 2007. Mike’s presentation was titled, "the Effect of Sphingomyelinase-Mediated Generation of Ceramide on Aggregation of Low Density Lipoprotein."

Mary Sullivan’s Second Year as NASA Fellow

Mary Sullivan is the first student in Drexel’s BS/PhD SuperNOVA program, majoring in Chemical Engineering. Under the advice of Giuseppe Palmese, she was selected as a NASA Graduate Fellow for the second year. Her research focus is the development of nanostructured conductive polymeric composites for chemical sensing applications, and she has been collaborating with the Sensors Division at Marshall Space Flight Center on her work.

Mary Sullivan was invited to present her PhD research at the International Symposium on Ionizing Radiation and Polymers, held September 26th in Antalya, Turkey. The title of her work was “Electron Beam Modification and Functionalization of Multiwalled Nanotubes for Covalent Dispersion in Polymeric Systems,” performed under the guidance of advisor Giuseppe Palmese, Department Head of Chemical and Biological Engineering.

The NSF IGERT is offered through the Drexel Nanotechnology Institute in cooperation with the University of Pennsylvania.

CBE Senior Design Team Competes in College of Engineering Competition

The College of Engineering held its Annual Senior Design Group Competition on Tuesday, June 5, 2007. The competition was sponsored by the Environmental Tectonics Corporation. Eight engineering projects were selected as finalists to present their work during this last round. The CBE senior design team members were Nicole Galante, Colleen Mackey, Michael Matt, and Thomas Salerno. The team’s design project entitled “Polymers from Renewable Fatty Acid Monomers” was advised by Prof. Giuseppe Palmese. The entire department of Chemical and Biological Engineering would like to congratulate the CBE senior design team for being selected as a finalist for the 2007 Senior Design Competition.
Prof. Abrams’ Work Featured on the Cover of Tissue Engineering

Prof. Cameron Abrams’ image of “chemoattractant concentration fields inside a 2D porous domain under steady production by a few point sources” was featured on the August 2007 cover of Tissue Engineering. The August 2007 special issue covers emerging technologies and new basic science and directions in tissue engineering. Prof. Abrams’ research in Drexel University’s Department of Chemical and Biological Engineering focuses on multiscale molecular simulations, molecular and cellular biophysics, and polymer thermodynamics.

Prof. Mutharasan’s Research Featured in Newspapers Across the Country

Raj Mutharasan and a sensor he developed to detect pathogens in food and liquids, was featured in the media throughout the academic year. He was featured on ABC Action News on September 16, 2006 after the E. coli outbreak nationwide with three cases reported in Pennsylvania. After the recent attention given to food-borne pathogens in the media nationwide, Prof. Mutharasan’s research on detecting food-borne pathogens was cited for finding a method of detecting individual bacterium in food samples. His research group is studying the use of piezoelectric-excited millimeter-sized cantilever sensors to detect pathogens and toxins such as E. coli and salmonella. He was featured in the October 9, 2006 issue of the L.A. Times, and the December 18 issue of the Philadelphia Inquirer. The story was syndicated and published in the Monterey County Herald (Calif.), Belleville News-Democrat (Ill.), Kansas City Star (Mo.), San Luis Obispo Tribune (Calif.), Biloxi Sun Herald (Miss.), Charlotte Observer (N.C.), Centre Daily Times (Pa.), Myrtle Beach Sun News (S.C.), Contra Costa Times (Calif.), The State (Columbia, S.C.), Bradenton Herald (Fla.) and Columbus Ledger-Enquirer (Ga.) and on Kentucky.com. Prof. Mutharasan was also featured on WCAU-TV [NBC-10] on December 17.
Publications


Current Grants

PI: Cameron Abrams
Title: Predicting Failure in Carbon Nanotube Reinforced Polymer Composites: A Novel Multiscale Simulation Approach
Source: Office of Naval Research
Total Funding: $336,313.00

PI: Cameron Abrams
Title: Cell Migration in Porous Biomaterials Engineering
Source: National Science Foundation
Total Funding: $96,129.00
Duration: 11/1/2003-10/31/2006

PI: Cameron Abrams
Title: ITR-ASE-sim: InhomogeneouslyResolved Simulation of Protein Assembly Dynamics
Source: National Science Foundation
Total Funding: $420,000.00
Duration: 9/1/2004-8/31/2009

PI: Cameron Abrams
Title: CAREER: Multiscale Simulation of Solute Transport in Hydrogels
Source: National Science Foundation
Total Funding: $400,000.00
Duration: 2/15/2006-1/31/2010

PI: Cameron Abrams
Title: Bioerodible Matrices for Bone Tissue Engineering
Source: University of Virginia
Total Funding: $15,333.00

PI: Cameron Abrams
Title: Thermodynamics of Heteropolymers Under Confinement
Source: American Chemical Society
Total Funding: $35,000.00
Duration: 2/1/2005-8/31/2008

PI: Richard Cairncross
Title: Collaborative Research on Thermal Spray of Multi-Scale Polymer/Ceramic Composite Coatings
Source: National Science Foundation
Total Funding: $319,643.00
Duration: 8/1/2002-7/31/2006

PI: Yossef Elabd
Title: Tuning Ionic Block Copolymers of Sulfonated Polystyrene And Polyvinyl Alcohol
Source: Army
Total Funding: $149,504.00

PI: Yossef Elabd
Title: Selective and Responsive Nanopore-Filled Membranes as Breathable Barriers
Source: Army
Total Funding: $698,070.00

PI: Anthony Lowman
Title: pH-Sensitive Complex Hydrogels for Protein Drug Release
Source: University of Texas at Austin
Total Funding: $726,444.00
Duration: 5/2/2005-4/30/2007

PI: Anthony Lowman
Title: Hydrogels for Nucleus Pulsor Replacement
Source: Synthes Spine Co, LP
Total Funding: $375,000.00

PI: Raj Mutharasan
Title: Ultra Sensitive Continuous Tapered Fiber Biosensors for Pathogens and Bioterrorism Agents
Source: National Science Foundation
Total Funding: $455,917.00

PI: Giuseppe Palmese
Title: Rational Design of Multifunctional Polymeric Composites
Source: Army
Total Funding: $713,968.00

PI: Giuseppe Palmese
Title: Multiscale Synthesis, Modeling, and Design of Advanced Polymer Systems
Source: Army
Total Funding: $1,463,600.00

PI: Giuseppe Palmese
Title: Multiscale Synthesis, Modeling, and Design of Advanced Polymer Systems: Carbon Nanoparticle Deposition, Functionalization, and Nanocomposite Development
Source: Army
Total Funding: $247,750

PI: Giuseppe Palmese
Title: Development of Low HAP, High Performance Vinyl Ester Resins
Source: Army
Total Funding: $150,000.00

PI: Giuseppe Palmese
Title: Modification and Optimization of ARL Plasma System for Treatment of Large Polymer Samples
Source: NASA
Total Funding: $36,760.00

PI: Giuseppe Palmese
Title: Reformulation Project
Source: Benjamin Franklin Technology Institute
Total Funding: $11,505.27

PI: Steven Wrenn
Title: Cholesterol Nanodomain Formation in Lipid Membranes
Source: National Institute of General Medical Science
Total Funding: $419,083.00
Duration: 2/1/2005-12/31/2007

PI: Steven Wrenn
Title: CAREER: Cholesterol Domains in Model Lipid Membranes
Source: National Science Foundation
Total Funding: $232,888.00
Duration: 1/15/2004-12/31/2006

PI: Steven Wrenn
Title: Symposium Novel Colloidal Technology
Source: Whitaker Foundation
Total Funding: $4,867.95
Duration: 3/15/2005-12/31/2005
If you would like to make a donation to the department, please contact Katie Smalley at 215-895-2239 or kms88@drexel.edu.