

Joseph M. DeSimone
 Chancellor's Eminent Professor of Chemistry at UNC
 William R. Kenan Jr. Distinguished Professor of
 Chemical Engineering at NC State and of Chemistry at UNC

Current Research Interests:

Applying the lithographic fabrication technologies from the computer industry for the design and synthesis of new medicines and vaccines; Nanomedicine; Interventional oncology; Fluoropolymers: photolithography, batteries, microfluidics, minimally adhesive surfaces; Medical devices; Colloid, surfactant and surface chemistry; New 3D Printing strategies; Role of diversity in innovation; Entrepreneurship from research-intensive universities; Public – private partnerships.

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DeSimone Group:
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<http://www.chem.unc.edu/people/faculty/desimone/>
 Carolina Center of Cancer Nanotechnology Excellence
<http://www.carolinaccne.unc.edu/>

Personal Information:

Born: May 16, 1964; Norristown, Pennsylvania.
 Married: Suzanne DeSimone since 1986; Children: Philip (b. 1989) and Emily (b. 1992).

Education:

BS Chemistry Ursinus College; May 1986.
 Ph.D. Chemistry Virginia Polytechnic Institute and State University; March 1990.
 (Advisor: Professor James E. McGrath, NAE)

Professional Positions:

2014 – Present CEO and Co-Founder, Carbon3D; A 3D printing company co-founded by DeSimone with Ed Samulski and Alex Ermoshkin located in Silicon Valley, California.
 2008 – Present Chancellor's Eminent Professor of Chemistry at UNC and William R. Kenan, Jr. Distinguished Professor of Chemical Engineering at NC State and of Chemistry at UNC
 2010 – Present Adjunct Member, Memorial Sloan Kettering Cancer Center and Sloan-Kettering Institute for Cancer Research
 2008 – Present Founding Director, Institute for Nanomedicine at UNC-CH
 2005 – Present Faculty Member, Lineberger Comprehensive Cancer Center and Dept. of Pharmacology, School of Medicine
 2005 – 2015 Co-PI, Carolina Center of Cancer Nanotechnology Excellence
 2012 – 2013 Director, Kenan Institute of Private Enterprise, Kenan Flagler Business School
 2003 – 2012 Founding Director, Institute for Advanced Materials, Nanoscience and Technology at UNC-CH
 1999 - 2009 Director, NSF Science and Technology Center for Environmentally Responsible Solvents and Processes
 1999 - 2008 William R. Kenan Jr. Distinguished Professor of Chemistry at UNC-CH and Chemical Engineering at NCSU
 1996 - 1999 Mary Ann Smith Professor of Chemistry at UNC-CH and Professor of Chemical Engineering at NCSU
 1995 Mary Ann Smith Associate Professor of Chemistry at UNC-CH and Chemical Engineering at NCSU
 1990 - 1994 Assistant Professor of Chemistry at UNC-CH

Election to Learned Societies

- Member of the National Academy of Medicine (2014)
- Member of the National Academy of Sciences (2012)
- Member of the National Academy of Engineering (2005)
- Member of the American Academy of Arts and Sciences (2005)

- Fellow, American Association for the Advancement of Science (AAAS) (2006)
- Phi Beta Kappa (Tau of Pennsylvania Chapter at Ursinus College)

Awards and Honors:

- **2015 National Medal of Technology and Innovation**, the highest honor in the United States for achievement and leadership in advancing technological progress
- **2015 Kabiller Prize in Nanoscience and Nanomedicine** from Northwestern University
- **2015 Dickson Prize for Science** from Carnegie Mellon University
- **2014 College of Science Hall of Distinction**, Virginia Tech
- **2014 Industrial Research Institute Medalist**
- **2014 Kathryn C. Hach Award for Entrepreneurial Success**, ACS National Award (w/ Ben Maynor and Jason Rolland, for developing the PRINT imprint lithography technology and founding Liquidia Technologies).
- **2013 Fellow** National Academy of Inventors
- **2012 Walston Chubb Award for Innovation**, presented by Sigma Xi, The Scientific Research Society, to honor and promote creativity in science and engineering.
- 2012 Fellow, American Chemical Society
- Named a **Paul Harris Fellow** by the Rotary Foundation of Rotary International “in appreciation of tangible and significance assistance given for the furtherance of better understanding and friendly relations among peoples of the world”
- **2010 AAAS Mentor Award**, recognizing members of the American Association for the Advancement of Science who have mentored significant numbers of students from underrepresented groups towards a Ph.D. in the sciences or who have changed the climate of a department, college or institution to significantly increase the diversity of students completing doctoral studies in the sciences.
- **2011 Mendel Medal** from Villanova University
- Chair, Gordon Research Conference on Drug Carriers in Medicine and Biology (2012)
- **2011 Harrison Howe Award by the Rochester Section of the American Chemical Society**
- *2011 PMSE Fellow*, Division of Polymeric Material Science and Engineering, American Chemical Society
- *2010 Founding POLY Fellow*, Division of Polymer Chemistry, American Chemical Society
- *2009 Tar Heel of the Year*, Undergraduates at the school newspaper selection of the Person of the Year
- **2009 NIH Director’s Pioneer Award**
- **2009 North Carolina Award**, the highest honor the State of North Carolina can bestow to recognize notable achievements of North Carolinians in the fields of Literature, Science, the Fine Arts and Public Service.
- *2009 Distinguished Graduate Alumni Achievement Award*, Virginia Tech
- *2009 Alexander M. Cruickshank Award*, Gordon Research Conferences
- **2008 recipient of the \$500,000 Lemelson-MIT Prize**
- **2008 Tar Heel of the Year**, Raleigh News & Observer
- Named one of the “*One Hundred Engineers of the Modern Era*” by the American Institute of Chemical Engineers (AIChE) marking the 100th Anniversary of the AIChE
- Business Leader Magazine’s *2007/2008 Impact Entrepreneur of the Year* for the Triangle
- 2008 Inductee into the *Order of the Golden Fleece*, the oldest honor society of its kind in the nation (since 1904) and the most prestigious honor society at the University of North Carolina at Chapel Hill
- **2007 Collaboration Success Award from The Council for Chemical Research**
- **Elected, College of Fellows, American Institute for Medical and Biological Engineering (2006)**
- *H.F. Whalen, Jr. 2006 Award for Entrepreneurship* by ACS Div. of Business Development & Management
- *2005 Entrepreneurial Excellence Award for Life Science Spin-out of the Year* for Liquidia Technologies
- **2005 American Chemical Society Award for Creative Invention**

- **2002 John Scott Award** presented by the City Trusts, Philadelphia, given to "the most deserving" men and women whose inventions have contributed in some outstanding way to the "comfort, welfare and happiness" of mankind
- **2002 Engineering Excellence Award by DuPont** for Successful Commercialization of Supercritical CO₂ Polymerization Plant at DuPont Fayetteville Works
- **2002 Wallace H. Carothers Award** from the Delaware Section of the American Chemical Society to honor scientific innovators who have made outstanding contributions and advances in industrial applications of chemistry
- **Ernst & Young 2001 Entrepreneur of the Year in Technology** (Carolinas)
- **2001 Inventor of the Year Award** from the Triangle Intellectual Property Law Association
- **2001 Governor's Entrepreneurial Company of the Year Award** for Micell Technologies
- **2001 Esselen Award for Chemistry in the Public Interest to recognize a chemist for outstanding achievement in scientific and technical work that contributes to the public well-being**
- **2001 Outstanding Young Alumnus Award** from the Virginia Tech Alumni Association
- **2000 Oliver Max Gardner Award** from the University of North Carolina, given to that person, who in the opinion of the Board of Governors' Committee, "... during the current scholastic year, has made the greatest contribution to the welfare of the human race."
- **1999 Fresenius Award** of the PHI LAMBDA UPSILON Honorary Chemical Society, presented annually to an outstanding young scientist who has attained national recognition in the areas of research and teaching
- **Carl S. Marvel Creative Polymer Chemistry Award (1999)**, presented annually to recognize accomplishments and/or innovation of unusual merit in the field of basic or applied polymer science by younger scientists
- **Runner-up, 1999 Tar Heel of the Year Award** (with Elizabeth Dole, Mia Hamm, and Bob Young of Red Hat)
- **Honorary Doctorate of Science** from Ursinus College (1999)
- **Alfred P. Sloan Research Fellowship (1998-2001)**
- **R&D 100 Award with Micell Technologies (1998)**
- **Presidential Green Chemistry Challenge Award (1997)** in recognition of outstanding chemical technologies (Surfactants for CO₂) that incorporate the principles of green chemistry into chemical design, manufacture, and use
- **Governor's Award for Excellence (1997)**
- **Chancellor's Award for Excellence (1997)**
- **1995 Waldo Semon Award Lecturer**, The University of Akron
- **1995 Charles H. Stone Award**
- **Finalist for the 1995 DISCOVER AWARD FOR TECHNOLOGICAL INNOVATION**
- **1993 Presidential Faculty Fellow Award** from the National Science Foundation
- **1993 Philip and Ruth Hettleman Prize for Artistic and Scholarly Achievement**
- **1992 National Science Foundation Young Investigator** - Division of Materials Research

Distinguished Lectureships and Public Presentations:

- **2016 Butler Lectureship in Polymer Chemistry** at the University of Florida
- **2015 38th Annual Carl F. Schmidt Lecture**, University of Pennsylvania School of Medicine
- **2015 27th Annual Robert F. Rushmer Lecture**, University of Washington, Department of Bioengineering
- **2015 W. Allan Powell Lectureship in Chemistry**, University of Richmond
- **2014 Dean's Distinguished Lecture Series**, NC A&T SU
- **2014 Distinguished Lecturer for the Parker H. Petit Institute for Bioengineering and Bioscience at Georgia Tech**
- **2014 Bayer Lecture**, University of Pittsburgh
- **2014 Novartis Lectureship**, Columbia University
- **2014 Distinguished Lecturer**, U. S. Naval Research Laboratory
- **2013 Inaugural Entrepreneurship and Innovation Lecture**, Ursinus College, 2013
- **2013 University Distinguished Lecture in Science & Engineering** at Stony Brook University
- **2012 NCIIA Plenary Lecture "Translating Basic Science into Products and the Role of Diversity in Making that Happen"**

- 2012 *Stieglitz Lecture*, Chicago Section of the ACS
- 2012 *Innovations in Public Health Lecture*, Gillings School of Global Public Health, UNC-Chapel Hill
- 2012 *Distinguished Lecturer*, Materials Research Science and Engineering Center (MRSEC) lecture series, University of Massachusetts Amherst
- 2012 *Keynote Lecture*, Luther Hodges Ethics Luncheon, Research Triangle Park, NC
- 2012 *Shell Science Seminar*, National Science Teachers Association (NSTA) National Conference on Sci. Education
- 2012 *Marker Lecture* in the Department of Chemistry at Penn State
- 2011 Speaker at TEDMED "...where the world's most creative minds meet healthcare's most innovative science..." in San Diego.
- 2011 *Distinguished Speaker Colloquium*, Department of Electrical and Computer Engineering, NC State University
- 2011 *Henry McGee Lecture* at Virginia Commonwealth University
- 2010-2011 *Aggarwal Lectures in Polymer Science*, Department of Chemistry, Cornell University
- 2010 *President's Council Symposium Lecturer*, Cold Spring Harbor Laboratory (with R. S. Langer and G. Whitesides)
- 2010 *Pigford Lecture*, Department of Chemical Engineering, University of Delaware
- 2010 *Danny Thomas Lecturer*, St. Jude Children's Research Hospital
- 2010 *Dow Lecture*, Northwestern University
- 2010 *Lecturer*, Novartis Institutes for Biomedical Research
- 2010 *NIST Colloquium Series Lecturer*
- *Plenary Speaker*, 10th Annual Oncology Research Symposium at MIT's Koch Institute for Integrative Cancer Research (2010)
- 2009 *Ulyot Lecturer* sponsored by the Delaware and Philadelphia Sections of the ACS, University of Pennsylvania and the Chemical Heritage Foundation
- 2009 *M. Cruickshank Lecturer* at the Gordon Research Conference on Polymers
- 2009 *Turner Alfrey Visiting Professor Lectures* at Michigan Molecular Institute (MMI)
- 2009 *Chevron Phillip Lecture* at Virginia Tech
- 2008 *Distinguished Lecture in Materials* at Penn State University
- 2008 *Distinguished Lecturer in Frontiers of Cancer Nanotechnology* at Emory University
- 2008 *Su Distinguished Lecture in Chemical Engineering*, University of Rochester
- 2007-2008 *Herman S. Bloch Memorial Lecture and the Bloch Medal*, University of Chicago
- 2007 *Ernest C. Mercier Lecture in Entrepreneurial Chemistry*, York University
- *Trent Lott Center Entrepreneurs in Polymer Science Lecture*, University of Southern Mississippi (2006)
- 2006 *Walter Weber Jr. Lectureship*, University of Michigan (Inaugural Speaker)
- 2006 *Distinguished Lecturer*, The 65th Frontiers in Chemistry, Case Western Reserve University
- 2006 *MacLean Lecturer*, McMaster University
- 2005-2006 *Nelson J. Leonard Distinguished Lectures*, School of Chemical Sciences, University of Illinois
- 2005 *Phi Lamda Upsilon / Glaxo Smith Kline Distinguished Lectureship* at NC State University
- 2004 *William H. Rauscher Lecture in Chemistry*, Rensselaer Polytechnic Institute
- 2004 *Milkovich Memorial Lectures*, Department of Polymer Science, University of Akron
- 2004 North Carolina Distinguished Lecturer Award from the NC Section of the ACS

University Service:

- UNC Office of Economic and Business Development (OEBD) Steering Committee Member
- Cancer Strategic Planning Advisory Group, UNC Health Care System (2010 - present)
- Member, Faculty Working Group Steering Committee, Chancellor's Innovation Circle (2010)

- University Cancer Research Fund Oversight Committee (2009 – present) w/ Dean of College of Arts and Sciences, Dean of the School of Pharmacy, Dean of the School of Medicine (Chair), Dean School of Public Health, Director of the Lineberger Cancer Center, Vice Chancellor for Research and Economic Development, Chair Department of Medicine, and Executive Associate Dean for Finance and Administration for the School of Medicine
- Curing Cancer Theme Team Co-leader, UCRF (2009 – present)
- Executive Advisory Committee, Department of Chemistry, University of North Carolina (2010 - present)
- Program Planning Committee, Lineberger Comprehensive Cancer Center (2008 – present)
- Chair, Committee to Facilitate the Launching of Start-up Companies at UNC; Created the Carolina Express License Agreement (<http://research.unc.edu/offices/otd/inventors/starting-a-company/>)
- Founded the Institute for Nanomedicine; Director (2008 – present)
- Founded the Institute for Advanced Materials, Nano Science and Technology; Director (2003 - present)
- Member, Core Planning Committee, Science Complex (2006 – present)

Government and Professional Service:

- Chair, National Academies Committee on “Convergence” in Biomedical Research (2013)
- Co-chair, NSF Committee to Assist Faculty Early Career Development (CAREER) Awardees in continuing their path to research leadership in their fields (2013)
- Member-at-Large, American Association for the Advancement of Science, Section on General Interest in Science and Engineering (2012-2016)
- Member, *Committee on Advancing Institutional Transformation for Minority Women in Academia* on behalf of the National Research Council of the National Academies (June 2011 – November 2012)
- Member, NIH Director’s Early Independence Award (DP5) Editorial Board (2011-2014)
- Member, Advisory Commission, North Carolina Museum of Natural Sciences (2011-2013)
- GRC Council Selection and Scheduling Committee (S&S) of the Gordon Research Conferences (2010-2016)
- Member, Board of Advisors, North Carolina Science Festival (2010-2012)
- Member, Executive Advisory Committee, United States Manufacturing Competitiveness Initiative, US Council on Competitiveness (2010)
- Member, College of Reviewers (by invitation only), Center for Scientific Review, NIH (2010-2012)
- Member, Advisory Committee for the NSF Directorate of Mathematical and Physical Sciences (MPSAC) (2009-2012)
- Co-Chair, Committee on Effectiveness of National Biosurveillance Systems: BioWatch and the Public Health System, National Academy of Sciences and the National Research Council (2008-2009)
- Co-Chair, Materials Engineering Section Peer Committee Member 2006-2009, National Academy of Engineering
- Member, Nanotechnology Technical Advisory Group (nTAG) to the President’s Council of Advisors on Science and Technology (PCAST) (2007-2008)
- Member, DARPA’s Defense Sciences Research Council (DSRC) (2006-2010)
- Fellow, Defense Sciences Research Council (DSRC) of DARPA (2004-2006)
- Defense Sciences Study Group, Institute for Defense Analysis funded by DARPA (2002-2003)
- Member, National Research Council Board on Chemical Sciences and Technology (2000-2004)

Boards and Councils:

- Editorial Advisory Board, *ACS Central Science* (2015 -)
- International Advisory Board, *Angewandte Chemie* (2014 -)
- Editorial Board, *Nanomedicine: Nanotechnology, Biology and Medicine*
- Advisory Board, *Chemical & Engineering News* (2012-2014)
- Editorial Advisory Board, *Small* (2012 - present)

- Editorial Advisory Board, *ACS Nano* (2012 - present)
- Board of Directors, *Research Triangle Foundation of North Carolina*; The Research Triangle Park is the leading and largest high technology research and science park in North America, covering 7,000 total acres. Founded in 1959, The Research Triangle Park is developed and managed by the non-profit Research Triangle Foundation of North Carolina. The Foundation is responsible for building and maintaining the physical aspects of the Park; attracting and retaining Park companies; and enhancing the competitive position of the Park and the Triangle region.
- Editorial Advisory Board, *Langmuir* (American Chemical Society: 2012-2014)
- Member, Board of Trustees, Ursinus College (2001- present); Vice Chair (2012-2013); Vice Chair Enrollment and Marketing Committee (2010); Presidential Search Committee (2010)
- Scientific Advisory Board, David H. Koch Institute for Integrative Cancer Research at MIT (2009 -)
- North Carolina School of Science and Math Education Foundation Board
- Co-Chair, National Network of Cancer Centers of Nanotechnology Excellence funded by the National Cancer Institute (w/ Sam Gambhir, Stanford) (2007/2008)
- International Advisory Board, *ChemSusChem* (2007-2012)
- Technology Council, *CCNE of Nanomaterials for Cancer Diagnostics and Therapeutics*, Northwestern University (2006-present)
- Member, Board of Directors, *Council for Entrepreneurial Development* (CED) (2005-2008)
- Scientific Advisory Committee, Center for Nanophase Material Sciences at Oak Ridge National Laboratory (2005 - present)
- Strategic Planning Group on Materials, Duke University (2005)
- Scientific Advisory Board, *Center for Environmentally Beneficial Catalysis*, NSF-ERC, University of Kansas
- Member, Advisory Board for the *Center for Entrepreneurship and Technology Venturing* at the Kenan Flagler Business School at University of North Carolina at Chapel Hill (2002 - present)
- Chair, *National Network of NSF Science and Technology Center Directors*, 2001
- Member, Board of Visitors, *Carolina Environmental Program* (2002-2005)
- Member, Advisory Council, Department of Chemistry, Virginia Tech (2001 - present)
- Green Chemistry Institute Founding Board Member (1999-2001)
- Founding Member, Board of Directors, Center for Environmentally Advanced Technologies (2000 – 2003)
- Editorial Board, *Journal of Supercritical Fluids* (2005-2008)
- Editorial Board, *Macromolecules* (2001-2003)
- Editorial Advisory Board, *Industrial and Engineering Chemistry Research* (2000-2003)
- Editorial Board, *Journal of Polymer Science* (1999 - present)
- Editorial Board, *Polymer Bulletin* (2002-2004)
- Editorial Board, *Journal of Applied Polymer Science* (1992-1999)
- Editorial Advisory Board, *High Performance Polymers* (1994-1999)
- *Synthesis Technical Advisory Board*, The DOW Chemical Company (1996 - 1999)

Technology Transfer and Entrepreneurial Activities

- Carbon3D, Inc. (<http://www.carbon3d.com>); Co-founder with Alex Ermoshkin and Edward Samulski. Carbon3D has developed a radical new approach to 3D printing that is > 100 times faster than state-of-the-art 3D printers, employing a continuous liquid interface where 3D objects can literally rise out of the broth within minutes. Initial focus is on professional prototypers that have aspirations to move to low- and medium-volume manufacturing and high valued products for the medical device and pharmaceutical industries.

- Hatteras Venture Partners (<http://hatterasvp.com>); Member, Scientific Advisory Board; along with Herb Boyer, Founder of Genentech; Jim Powell, Founder of LabCorp; Charlie Sanders, Former CEO Glaxo; David King, CEO of LabCorp; Arnie Levine, Former President and CEO of Rockefeller University; Martin Murphy, former CEO of Hipple Cancer Center.
- Reviewer, “Managing University Intellectual Property in the Public Interest”; Committee on Management of University Intellectual Property: Lessons from a Generation of Experience, Research, and Dialogue”, National Research Council, 2011.
- Co-authored “Facilitating the Commercialization of University Innovation: The Carolina Express License Agreement”; a position paper co-authored with Lesa Mitchell, Ewing Marion Kauffman Foundation; April 2010.
- *Liquidia Technologies, Inc.*, (<http://www.liquidia.com>) Member of the Board of Directors (2004-2013), Consultant and Co-Founder (w/ J. Rolland, G. Denison, B. Maynor, E. T. Samulski and Bruce Boucher); Liquidia is co-opting the fabrication technologies from the computer industry to make vaccines and medicines. The manufacturing process called PRINT™ is licensed from DeSimone’s labs at UNC-CH / NCSU. Liquidia develops and manufactures precisely engineered nanoparticles and films for use in a broad range of life and materials science industries. Current areas of focus include targeted delivery of nucleic acids and cytotoxic small molecules; ocular and inhaled therapeutics; vaccines; and featured films for displays. We have raised almost \$60 million as of March 2011, including the first ever equity investment by the Bill and Melinda Gates Foundation in a for-profit biotech. Liquidia’s first vaccine product entered clinical trials in Q4 2010.
- Partner with *Synecor* (<http://www.synecor.com/>), a medical devices company which creates new generations of diagnostic/therapeutic technologies and promotes their rapid dissemination into the marketplace. Synecor is led by R. Stack, W. Starling and M. Williams. Companies spun out by us include:
 - *Bioabsorbable Vascular Solutions*, Co-Founder (w/ R. Stack, W. Starling, M. Williams, & R. Langer) and Sci. Adv. Board Member (Founded in August, 2002; Acquired by *Guidant Corporation* [NYSE: GDT] in March, 2003); Technology is based a fully bioabsorbable polymeric drug eluting stents. Now part of Abbott Vascular. In January 2011, Abbott received CE Mark Approval for the sale of our stents in Europe. In January 2013 Abbott began a randomized clinical trial in the USA enrolling 2,250 patients.
- *Noxilizer, Inc.* (<http://www.noxilizer.com/>) Member, Scientific Advisory Board (2006 – 2009); Company solves problems ranging from medical instrument sterilization to chemical and biological agent destruction using proprietary gas technology.
- *MICELL Technologies, Inc.*, (<http://www.micell.com>) Co-Founder (w/ J. B. McClain and T. J. Romack) and Chairman (1996-2003); Technology is based on liquid and supercritical CO₂ for microelectronics fabrication and high performance low surface energy coatings. Micell also pioneered and launched the first liquid CO₂-based garment dry cleaning technology through Hangers Cleaners (<http://www.hangersdrycleaners.com>) (Micell sold Hangers to Cool Clean, LLC in 2001). Micell is now actively applying the supercritical coating know-how to medical devices including stents. In 2009 Micell raised an additional \$20 million from VCs and strategic investors.
- Supercritical CO₂ Fluoroolefin Polymerization Technology; Licensed exclusively to DuPont in 1996; DuPont announced investment of \$275 million to commercialize the technology; 2 million lbs/year plant successfully brought on line in March, 2002.

Current Collaborators:

Joel Tepper, Young Whang, Andy Wang, Jay Raval, Leaf Huang, Bill Zamboni, Ed Samulski, Jenny Ting, Shelley Earp, Jim Bear, Michael Rubinstein, Rudy Juliano, Sergei Sheiko, Valerie Ashby, Weili Lin, Heinrich

Jaeger, Steve Larson (MSKCC), David Scheinberg (MSKCC), Hedi Hricak (MSKCC), At Liquidia: Michelle Stone.

Refereed Publications and Recently Submitted Manuscripts:

(DeSimone has 17,700+ citations to his work as measured by *Science Citation Index* in March 2016; DeSimone's Hirsch Index "*h-Index*" = 65, that is he has 65 papers with 65 or more citations, see Hirsch, J. E. *Proc. Nat. Acad. Sci.* **2005**, *46*, 16569)

1. "Subtumoral analysis of PRINT nanoparticle distribution reveals targeting variation based on cellular and particle properties"; Roode, L. E.; Brighton, H.; Bo, T.; Perry, J. L.; Parrott, M. C.; Kersey, F.; Luft, J. C.; Bear, J. E.; DeSimone, J. M.; Davis, I. J. *Nanomedicine: Nanotechnology, Biology, and Medicine* **2016**, *12*(4), 1053-1062.
2. "Iontophoretic device delivery for the localized treatment of pancreatic ductal adenocarcinoma"; Byrne, J. D.; Jajja, M. R. N.; Schorzman, A. N.; Keeler, A. W.; Luft, J. C.; Zamboni, W. C.; DeSimone, J. M.; Yeh, J. J. *Proceedings of the National Academy of Sciences* **2016**, *113*(8), 2200-2205.
3. "Tumor presence induces global immune changes and enhances nanoparticle Clearance"; Kai, M. P.; Brighton, H. E.; Fromen, C. A.; Shen, T. W.; Luft, J. C.; Luft, Y. E.; Keeler, A. W.; Robbins, G. R.; Ting, J. P. Y.; Zamboni, W. C.; Bear, J. E.; DeSimone, J. M. *ACS Nano* **2016**, *10*(1), 861-870.
4. "Compliant glass-polymer hybrid single ion-conducting electrolytes for lithium batteries"; Villaluenga, I.; Wujcik, K. H.; Tong, W.; Devaux, D.; Wong, D. H. C.; DeSimone, J. M.; Balsara, N. P. *Proceedings of the National Academy of Sciences* **2016**, *113*(1), 52-57.
5. "Targeted PRINT hydrogels: The role of nanoparticle size and ligand density on cell association, biodistribution, and tumor accumulation"; Reuter, K. G.; Perry, J. L.; Kim, D.; Luft, J. C.; Liu, R. H.; DeSimone, J. M. *Nano Letters* **2015**, *15*(10), 6371-6378.
6. "Nanoparticulate immunotherapy for cancer"; Kapadia, C. H.; Perry, J. L.; Tian, S. M.; Luft, J. C.; DeSimone, J. M. *J. Control. Release* **2015**, *219*, 167-180.
7. "Towards programming immune tolerance through geometric manipulation of phosphatidylserine"; Roberts, R. A.; Eitas, T. K.; Byrne, J. D.; Johnson, B. M.; Short, P. J.; McKinnon, K. P.; Reisdorf, S.; Luft, J. C.; DeSimone, J. M.; Ting, J. P. Y. *Biomaterials* **2015**, *75*, 1-10. (# of citations = 1)
8. "Reductively Responsive Hydrogel Nanoparticles with Uniform Size, Shape, and Tunable Composition for Systemic siRNA Delivery in Vivo"; Ma, D.; Tian, S. M.; Baryza, J.; Luft, J. C.; DeSimone, J. M. *Molecular Pharmaceutics* **2015**, *12*(10), 3518-3526. (# of citations = 0)
9. "Distribution and cellular uptake of PEGylated polymeric particles in the lung towards cell-specific targeted delivery"; Shen, T. W.; Fromen, C. A.; Kai, M. P.; Luft, J. C.; Rahhal, T. B.; Robbins, G. R.; DeSimone, J. M. *Pharmaceutical Research* **2015**, 10.1007/s11095-015-1701-7. (# of citations = 0)
10. "Rapid and persistent delivery of antigen by lymph node-targeting PRINT nanoparticle vaccine carrier to promote humoral immunity"; Mueller, S. N.; Tian, S.; DeSimone, J. M. *Molecular Pharmaceutics* **2015**, *12*(5), 1356-1365. (# of citations = 3)
11. "Biodistribution and trafficking of hydrogel nanoparticles in adult mosquitoes"; Paquette, C. C. H.; Phanse, Y.; Perry, J. L.; Sanchez-Vargas, I.; Airs, P. M.; Dunphy, B. M.; Xu, J.; Carlson, J. O.; Luft, J. C.; DeSimone, J. M.; Bartholomay, L. C.; Beaty, B. *J. PLoS Neglected Tropical Diseases* **2015**, *9*(5), e0003745. (# of citations = 1)

12. "Biodistribution and toxicity studies of PRINT hydrogel nanoparticles in mosquito larvae and cells"; Phanse, Y.; Dunphy, B. M.; Perry, J. L.; Airs, P. M.; Paquette, C. C. H.; Carlson, J. O.; Xu, J.; Luft, J. C.; DeSimone, J. M.; Beaty, B. J.; Bartholomay, L. C. *PLoS Neglected Tropical Diseases* **2015**, 9(5), e0003735. (# of citations = 1)
13. "Preparation and biological evaluation of synthetic and polymer-encapsulated congeners of the antitumor agent pactamycin: Insight into functional group effects and biological activity"; Sharpe, R. J.; Malinowski, J. T.; Sorana, F.; Luft, J. C.; Bowerman, C. J.; DeSimone, J. M.; Johnson, J. S. *Bioorg. Med. Chem.* **2015**, 23(8), 1849-1857. (# of citations = 2)
14. "Analysis of human innate immune responses to PRINT fabricated nanoparticles with cross validation using a humanized mouse model"; Robbins, G. R.; Roberts, R. A.; Guo, H.; Reuter, K.; Shen, T.; Sempowski, G. D.; McKinnon, K. P.; Su, L.; DeSimone, J. M.; Ting, J. P. Y. *Nanomedicine* **2015**, 11(3), 589-599. (# of citations = 4)
15. "Continuous liquid interface production of 3D objects"; Tumbleston, J. R.; Shirvanyants, D.; Ermoshkin, N.; Januszewicz, R.; Johnson, A. R.; Kelly, D.; Chen, K.; Pinschmidt, R.; Rolland, J. P.; Ermoshkin, A.; Samulski, E. T.; DeSimone, J. M. *Science* **2015**, 347(6228), 1349-1352. (# of citations = 29)
16. "Silylated precision particles for controlled release of proteins"; Khodabandehlou, K.; Kumbhar, A. S.; Habibi, S.; Pandya, A. A.; Luft, J. C.; Khan, S. A.; DeSimone, J. M. *ACS Appl. Mater. Interfaces* **2015**, 7(10), 5756-5767. (# of citations = 0)
17. "Evaluation of drug loading, pharmacokinetic behavior, and toxicity of a cisplatin-containing hydrogel nanoparticle"; Kai, M. P.; Keeler, A. W.; Perry, J. L.; Reuter, K. G.; Luft, J. C.; O'Neal, S. K.; Zamboni, W. C.; DeSimone, J. M. *J. Control. Release* **2015**, 204, 70-77. (# of citations = 3)
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Funded Research Projects (Total grants raised: \$96,874,077)

1. "PRINT Butyrylcholinesterase Delivery"; \$4,477,660; 10/2013 – 9/30/2018.
2. "Urinary Tract Infection Prevention and Spinal Chord Injury"; \$1,001,008; DeSimone Co-PI; 7/2013 – 6/2016
3. "Molecular Mosquitocides: Development of a robust, platform-based approach for sustainable insecticidal control of Anopheline mosquitoes; Particle based delivery of nucleic acid sequences for control of mosquitoes"; DeSimone (Co-PI), \$297,495; 7/1/11 – 6/30/14.
4. "Nanoparticle-Targeted Peptide Vaccines for Prostate Cancer: The Harvard-Hopkins-Carolina Consortium"; J.M. DeSimone (Co-PI), \$500,000/year for 2 years; \$154,902/year at UNC-CH.
5. "Carolina Center of Cancer Nanotechnology" Chapel Hill, NC, J.M. DeSimone (Co-PI), 9/30/2005-9/30/2015; 1-U54-CA151652-01; 530282; \$31,719,352
6. "Delivery of Biological Therapeutics" Office of the Director, Pioneer Award, National Institutes of Health, Chapel Hill, NC, J.M. DeSimone (PI), 9/30/2009-7/31/2014; 1DP1OD006432 ; 530416; \$3,750,000
7. "Novel Perfluoropolyether and Fouling Release Coatings: Investigation of Structure" Office of Naval Research, Chapel Hill, NC, J.M. DeSimone (PI), 2/1/2010-1/31/2013; N00014-07-1-02612; 535775; \$435,525
8. "Engineered Organic Particles of Controlled Size, Shape and Surface Chemistry" National Institute of Biomedical Imaging and Bioengineering, Chapel Hill, NC, J.M. DeSimone (PI), 5/1/2009-4/30/2013; 1R01EB009565; \$653,766
9. "Red Blood Cells Mimic", National Heart, Lung, and Blood Institute, Chapel Hill, NC, J.M. DeSimone (PI), 3/11/2010-2/29/2012; 1R21HL092814; \$201,684
10. "University Cancer Research Fund" Chapel Hill, NC, J.M. DeSimone (Co-PI), 2007-2011; \$1,200,000
11. "ARRA – Biomimetic Approach to the Fabrication of Red Blood Cell Mimics" National Heart, Lung and Blood Institute, Chapel Hill, NC, J.M. DeSimone (PI) 7/1/2009-6/30/2011; 1-R21-HL092814-01 ; 552277; \$361,926
12. "EAGER: Meso-Polymers" NSF Research, Chapel Hill, NC, J.M. DeSimone (PI), 5/1/2009-4/30/2011; DMR-0923604 ; 554766; \$278,973

13. "Research Agreement between UNC and Liquidia in the area of PFPE, Lithography, Microfluidics, Nanostudies and membrane studies" Liquidia Technologies, Chapel Hill, NC, J.M. DeSimone (PI) 9/1/2005-8/31/2010; \$1,537,819
14. "UNC-CH EFRC: Solar Fuels and Next Generation" US Department of Energy, Chapel Hill, NC, J.M. DeSimone (Co-PI), 8/1/2009-7/31/2010; 535930; \$70,000
15. "NSF Science & Technology Center for Environmental Responsible Solvents and Processes" NSF, Chapel Hill, NC, J.M. DeSimone (PI), 11/1/1999-4/30/2010;537494: \$36,117,733
16. "Novel Perfluoropolyether and Fouling Release Coatings: Investigation of Structure" Office of Naval Research, Chapel Hill, NC, J.M. DeSimone (PI), 11/1/2006-5/31/2010; 535763; \$450,000
17. "Designer Functional Particles for Controlled Jamming: First Step Toward Soft Robotics"; Sub contract from University of Chicago, Chapel Hill, NC, J.M. DeSimone (PI), 5/21/2008-6/20/2010;543091; \$541,596
18. "Fabrication and Characterization of Well-Ordered Polymer Composite Dielectric" Office of Naval Research, Chapel Hill, NC, J.M. DeSimone (PI), 5/1/2008-8/31/2010; \$186,274
19. "Polymerization of Fluoromonomers in Supercritical Fluids, E.I.DuPont NeNemours&Co., Chapel Hill, NC, J.M. DeSimone (PI), 12/17/1992-1/1/2009; \$2,555,000
20. "The Pharmacodynamics of Genes and Oligonucleotides" National Institute of General Medicine Science, Chapel Hill, NC, J.M. DeSimone (Co-PI), 4/1/2000-3/31/2009;532218; \$560,000.
21. "Proton Exchange Membranes for Next Generation Fuel Cells" US Department of Energy, Chapel Hill, NC, J.M. DeSimone (PI), 9/15/2005-9/14/2009; 535908,\$900,000
22. "Integrated Nanofluidic Electronic Sensor Technologies for Army Applications" US Army Research Office, Chapel Hill, NC, J.M. DeSimone (PI), 8/15/2005-3/31/2009;536848; W911NF-05-2-0047 \$3,006,000
23. "Environmentally Responsible Processes for High Resolution Dry Lithography of Semiconductor Wafers", US Environmental Protection Agency, Chapel Hill, NC, J.M. DeSimone (PI), 8/1/2005-7/31/2007;R083245401; \$678,600
24. "Replicating Viral Particles Using Nano-molding Techniques: The Particle Foundry" US Army Research Office, Chapel Hill, NC, J.M. DeSimone (PI), 7/25/2006-7/24/2007; W911NF-06-1-0343; \$200,000
25. "Targeted Delivery Via Protein-Carbohydrate Interactions", National Cancer Institute, Chapel Hill, NC, J.M. DeSimone (PI), 12/1/2000-2/2/2007; \$43,996
26. "Novel Perfluoropolyether Fouling Release Coatings: Investigations into the Effect of Polymer Structure & Material Properties on Surface Properties" Office of Naval Research, Chapel Hill, NC, J.M. DeSimone; 12/1/2001-9/30/2006; 535763; \$700,670
27. "Microfluidic Devices - Aaryn Jones Scholarship" US Environmental Protection Agency, Chapel Hill, NC, J.M. DeSimone (PI), 9/8/2003-9/8/2006; \$264,030
28. "Supported Research Agreement with Synekor", Synekor, Chapel Hill, NC, J.M. DeSimone (PI), 5/1/2005-4/30/2006; \$37,284

29. "Dry Lithography: Environmentally Responsible Processes For High Resolution Pattern Transfer & Elimination of Image Collapse" US Environmental Protection Agency/NSF, Chapel Hill, NC, J.M. DeSimone (PI), 3/11/2002-3/10/2005; \$349,966
30. "Processing for sub-micron imaging on supercritical CO₂: An integrated approach to the deposition and development of photoresists" NSF; Chapel Hill, NC, J.M. DeSimone (PI), 2/15/2002-1/31/2005; \$22,749
31. "Request for Proposal for Independent Technical Consultation of Low Adhesive Coatings to the Shuttle External Tank" Swales Aerospace, Chapel Hill, NC, J.M. DeSimone (PI), 5/5/2005-7/30/2005; \$17,844
32. "Carbon Dioxide in Nature and Technology Internships in Public Education" North Carolina State University, Chapel Hill, NC, J.M. DeSimone (PI) 1/1/2002-12/31/2004; \$27,933
33. "Very Low Surface Energy Heterophase Polymeric Materials Separations" University of Texas at Austin, US Navy; Chapel Hill, NC, J.M. DeSimone (PI) 5/1/2002-9/30/2004; \$184,935
34. "Nitoxide Assisted Living Free Radical Polymerization of Block Copolymers in Supercritical CO₂. Characterization by Light Scattering Techniques" NSF Training, Chapel Hill, NC, J.M. DeSimone (PI), 7/1/2001-6/30/2004; \$13,080
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36. "Kenan Center for the Utilization of CO₂ in Manufacturing", North Carolina State University, Chapel Hill, NC, J.M. DeSimone (PI), 7/1/1997-6/30/2004; DuPont, Air Products, Atochem, Dow Chemical, Micell Technologies, Nalco, Occidental Chemical, Praxair, Rohm and Haas, Sandia National Labs, Solvay, Thar Design, UHDE; \$1,585,534
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38. "2000 Research and Engineering Apprenticeship Program" Academy of Applied Science, Chapel Hill, NC, J.M. DeSimone (PI), 7/1/2000-8/31/2001; \$2,500
39. "Research Agreement with Solvay (SAPI PVF Project), Solvay Advanced Polymers, Inc., Chapel Hill, NC, J.M. DeSimone (PI), 10/1/1997-6/30/2001; \$281,000
40. "Presidential Faculty Fellow Award", 5-37123; DMR-9350334NSF, Chapel Hill, NC, J.M. DeSimone (PI), 8/15/1993-1/31/1998; \$337,500
41. "NSF Young Investigator's Award" ; 537048; DMR-9258571Chapel Hill, NC, J.M. DeSimone (PI), 8/15/1992-1/31/1995, \$100,000
42. "Synthesis Strategies for Tailored Energetic Polymers" Office of Naval Research, Chapel Hill, NC, J.M. DeSimone (PI), 6/1/1992-5/31/1993; 535770; N00014-92-J-1758;\$32,657
43. "New Thiophene Based Materials" Office of Naval Research, Chapel Hill, NC, J.M. DeSimone (PI) 12/1/1991-11/30/1994,535766 N00014-92-J-1374; \$361,988

Issued Patents:

1. **US Patent 5,496,901** March 5, 1996; "Method of Making Fluoropolymers in Carbon Dioxide"; Inventor - J. M. DeSimone; Filed: March 27, 1992.
2. **US Patent 5,312,882**; May 17, 1994; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
3. **US Patent 5,266,677**; November 30, 1993; "Thiophene-based Materials"; Inventors - E. T. Samulski and J. M. DeSimone.
4. **US Patent 5,354,836**; November 11, 1994; ; "Thiophene-based Materials"; Inventors - E. T. Samulski and J. M. DeSimone.
5. **US Patent 5,358,836**; October 21, 1994; "Thiophene-based Materials"; Inventors - E. T. Samulski and J. M. DeSimone.
6. **US Patent 5,360,869**; November 1, 1994; "Method of Making Fluorinated Copolymers"; Inventors - J. M. DeSimone and M. O. Hunt, Jr.
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142. **US Patent 8,420,124**; April 16, 2013; "Methods for Fabricating Isolated Micro- and Nanostructures"; DeSimone, J. M.; Rolland, Exener, A.; Samulski, E. T.; Samulski, R. J.; J. P. Maynor, B. W.; Euliss, L. E.; Rothrock Denison, G.; Gratton, Stephanie; Ermoshkin, Alex; Murphy, Andrew.
143. **US Patent 8,444,899**; May 21, 2013; "Methods and Materials for Fabricating Microfluidic Devices"; DeSimone, J. M.; Rolland, J. P.; Rothrock, G.; Resnick, P.
144. **US Patent 8,465,775**; June 18, 2013; "Nanoparticle Fabrication Methods, systems and materials for fabricating artificial red blood cells"; DeSimone, J. M.; Samulski, E. T.
145. **Korean Patent 10-1281775**; Methods of Fabricating Isolated Micro- and Nanostructures Using Soft or Imprint Lithography
146. **Chinese Patent ZL200680029884.7**; Issued October 23, 2013; "Nanoparticle Fabrication Methods, Systems and Materials; Inventors: J. M. DeSimone, J. P. Rolland, A. Exner, E. Samulski, R. Samulski, B. Maynor, L. Euliss, G. Rothrock, S. Gratton, A. Ermoshkin, A. Murphy
147. **Canadian Patent 2,549,341**; Issued: October 11, 2013; Methods of Fabricating Isolated Micro- and Nanostructures Using Soft or Imprint Lithography
148. **US Patent 8,703,026**; Issued April 22, 2014; Method of Making Orthodontic Appliances; Inventors: J. M. DeSimone and Robert E. Tricca
149. **Korean Patent 10-1376715**; March 14, 2014; Methods of Fabricating Isolated Micro- and Nanostructures Using Soft or Imprint Lithography; Inventors: J. M. DeSimone, J. P. Rolland, A. E. Exner, E. T. Samulski, R. J. Samulski, B. W. Maynor, L. E. Euliss, G. M. Denison.

150. **US Patent 8,771,337**; July 8, 2014; "Endoprostheses and Methods of Manufacture": Inventors: DeSimone, J. M.; Williams, M. S.
151. **Japanese Patent 5570721**; "Nanoparticle Fabrication Methods, systems and materials"; DeSimone, J. M.; Samulski, E. T.
152. **Indian Patent 261330**; Photocurable Perfluoropolyethers for Use as Novel Materials in Microfluidic Devices"; DeSimone, J. M.; Rolland, J. P.; Quake, S. R.; Schorzman, D. A.; Yarbrough, J.; Van Dam, M.
153. **Canadian Patent 2,549,341**; Methods of Fabricating Isolated Micro- and Nanostructures Using Soft or Imprint Lithography; Inventors: J. M. DeSimone, J. P. Rolland, A. E. Exner, E. T. Samulski, R. J. Samulski, B. W. Maynor, L. E. Euliss, G. M. Denison.

Current Research Group

<u>Name</u>	<u>Position</u>	<u>Previous Institution</u>
Bloomquist, Cameron	Ph.D. Candidate, Pharmacy (exp 2018)	Clemson University
Byrne, James	Postdoctoral Scholar	UNC-CH MD/PhD
Caudill, Cassie	Ph.D. Candidate, Pharmacy (exp 2018)	Transylvania University
Coffman, Jason	Ph.D. Candidate at NCSU (exp 2018)	University of Delaware
Huang, Lihong	Research Associate	UNC-CH (Pathology & Lab Medicine)
Januszewicz, Rima	Ph.D. Candidate, Chemistry (exp 2018)	James Madison University
Johnson, Ashley	Ph.D. Candidate, BME (exp 2016)	Washington University (St. Louis)
Kapadia, Chintan	Ph.D. Candidate, Pharmacy (exp 2017)	Polytechnic Inst. of NYU; Gujarat Univ.
Luft, Chris	Research Associate Professor	Liquidia / Nanovector
Mecham, Sue	Research Associate	Virginia Tech
Nebipasagil, Ali	Postdoctoral Scholar	Virginia Tech
Olson, Kevin	Ph.D. Candidate, Chemistry (exp 2019)	Hope College (Michigan)
Paradzinsky, Mark	Undergraduate	UNC-CH
Perry, Jillian	Research Associate	Univ. of Florida; Postdoc at UNC
Pinschmidt, Bob	Research Associate	UNC-CH
Quintanilla, Adam	Ph.D. Candidate at NCSU (exp 2018)	Florida State University
Rahhal, Tojan	Ph.D. Candidate, Pharmacy (exp 2017)	North Carolina State University
Tian, Shaomin	Research Assistant Professor	UNC Microbiology
Wang, Ying	Postdoctoral Scholar	UNC-CH
Wilson, Erin	Ph.D. Candidate, Pharmacy (exp 2018)	Purdue University
Yi, Xianwen	Research Associate	UNC-CH

Past Group Members and Visitors (* denotes people currently in academic positions)

- 73 Postdocs;
- 56 Ph.D. Degrees in Chemistry;
 - 1 Ph.D. Degree in Microbiology & Immunology
 - 4 Ph.D. Degrees in Pharmaceutical Sciences
- 11 Ph.D. Degrees in Chemical Engineering;
- 13 M.S. Degrees in Chemistry;
 - 1 M.S. Degree in Chemical Engineering;
- 24 B.S. Chemistry

A) Past Ph.D. Graduates

*Ashby, Valerie

Thesis: Synthesis and characterization of thiophene-based high performance polymers

Graduated **1994**

*Guan, Zhibin

Thesis: Homogeneous free radical polymerizations in supercritical carbon dioxide

Graduated: **1994**

Peters, Mark

Thesis: Molecular engineering of well-defined heterophase materials

Graduated: **1994**

Hunt, Michael

Thesis: Studies on the end-functionalization of living anionic polymerization

Graduated: **1995**

Maury, Elise

Thesis: Heterogeneous free radical polymerizations in supercritical carbon dioxide

Graduated: **1995**

Tahiliani, Shonali

Thesis: Living alternating copolymerizations of styrenic monomers and carbon monoxide using a Pd(II) catalyst

Graduated: **1995**

Dukes, Katerina

Thesis : Reactivity and dynamics of spin-polarized radical pairs

Graduated: **1996**

Mistele, Chad

Thesis: Metathesis and oxidative coupling polymerizations in carbon dioxide

Graduated: **1996**

*Canelas, Dorian

Thesis: Dispersion polymerization of vinyl monomers using nonionic surfactants in liquid and supercritical CO₂

Graduated: **1997**

Clark, Michael

Thesis: Studies of cationic processes in carbon dioxide

Graduated: **1997**

Kassis, Camille

Thesis: Surface and mass spectral analysis of polymeric materials utilizing XPS and MALDI

Graduated: **1997**

*Romack, Tim

Thesis: Polymerization of fluoro-olefins in liquid and supercritical carbon dioxide

Graduated: **1997**

Tanner, Martha

Thesis: Mechanistic studies of Co(III)-catalyzed reactions: Living polymerization of ethylene

Graduated: **1997**

Betts, Douglas

Thesis: The synthesis, characterization, and application of CO₂-soluble, non-ionic amphiphilic block copolymers

Graduated: **1998**

Kipp, Brian

Thesis: The synthesis of fluoropolymers in carbon dioxide and carbon dioxide/aqueous systems

Graduated: **1998**

Phillips, Rich

Thesis: The synthesis of poly(arylene)s via nickel(0)-catalysis: Homopolymers and copolymers

Graduated: **1998**

Maxwell, Kim

Thesis: Antenna polymer mimics for energy and electron transfer processes in photosynthesis

Graduated: **1999**

Bunyard, Clay

Thesis: Novel methods for synthesis of perfluoropolyethers

Graduated: **2000**

Carson, Terri

Thesis: The preparation of fluorinated and water-soluble materials via heterogeneous polymerizations in CO₂

Graduated: **2000**

* Gross, Stephen

Thesis: Step-growth polymerizations facilitated by scCO₂: The synthesis of poly(bisphenol A carbonate)

Graduated: **2000**

McClain, Jim

Thesis: Characterization of polymers and amphiphiles in liquid and supercritical carbon dioxide

Graduated: **2000**

Royer, Joseph

Thesis: Supercritical fluid assisted polymer processing: Plasticization, swelling and rheology

Graduated: **2000**

Wells-Kennedy, Sharon

Thesis: The study of amphiphilic block copolymers in selective solvents

Graduated: **2000**

Crette, Stephanie

Thesis: Solid supports for catalysis and separation processes in compressed carbon dioxide

Graduated: **2001**

Shultz, Scott

Thesis: Mechanistic investigations of Ni(II) and Pd(II) catalyzed copolymerization of carbon monoxide & olefins

Graduated: **2001**

Erford, Karen (McAllister)

Thesis : Polymeric nanogels produced via inverse micromulsion polymerization for gene and antisense delivery

Graduated: **2002**

Flowers, Devin

Thesis: Designing photoresist systems for dry microlithography in carbon dioxide

Graduated: **2002**

Hoggan, Eric

Thesis: Spin coating and photolithography using liquid and supercritical carbon dioxide

Graduated: **2002**

Ye, Weijun

Thesis: Well-defined sugar-containing amphiphiles & application to heterogeneous polymerizations in scCO₂

Graduated: **2002**

Folk, Sarah

Thesis: Fluorinated and siloxane-based homopolymers and surfactants: Characterization of interactions and aggregation by scattering techniques in compressed carbon dioxide

Graduated: **2003**

Kennedy, Karen

Thesis: Characterization of phase equilibrium associated with heterogeneous polymerizations in scCO₂

Graduated: **2003**

Novick, Brian

Thesis: Free meniscus coating using compressed carbon dioxide

Graduated: **2003**

Behles, Jacqueline

Thesis: Synthesis of hollow core-shell polymer particles and the synthesis of phosphate fluorosurfactants for use in carbon dioxide

Graduated: **2004**

Jones, Charles

Thesis: Etching of silicon dioxide thin films and synthesis of novolac resins in supercritical carbon dioxide

Graduated: **2004**

Visintin, Pamela

Thesis: Slurry design towards a "dry" carbon dioxide-based copper chemical mechanical planarization process for device fabrication

Graduated: **2004**

Xu, Bin

Thesis: High pressure nuclear magnetic resonance studies of self-assembly structures formed with phosphorous fluorosurfactants in liquid/supercritical carbon dioxide

Graduated: **2004**

Young, Jennifer

Thesis: Composite polymer particles in supercritical carbon dioxide: Synthesis and characterization

Graduated: **2004**

Zannoni, Luke

Thesis: Fluoroolefin copolymerizations in scCO₂ towards the development of a 157 nm photoresist

Graduated: **2004**

Astrum-Acevedo, Jim

Thesis: Synthesis and characterization of linear AB diblock copolymeric styrenic-based energy conducting polymers with pendant ruthenium (II) trisbipyridyl chromophores

Graduated: **2005**

Denison, Ginger

Thesis: Carbon dioxide based etchant solutions for copper chemical mechanical planarization

Graduated: **2005**

Kim Jaehoon

Thesis: Deposition of thin organic and metal films from carbon dioxide by free meniscus and solvent displacement methods

Graduated: **2005**

Liu, Tao

Thesis: Continuous precipitation polymerization of acrylic acid in supercritical carbon dioxide

Graduated: **2005**

Rolland, Jason

Thesis: Functional perfluoropolyethers for novel applications

Graduated: **2005**

Boggiano, Mary Kate

Thesis: Addition polymerization toward the synthesis of photoresists for microlithography with CO₂ development

Graduated: **2006**

Guo, Ji

Thesis: Design chemistry for the environment: From processing fluoropolymers in supercritical carbon dioxide to new nonbiopersistent fluorinated coating materials

Graduated: **2006**

Zhou, Zhilian

Thesis: Novel polymer electrolyte membranes for fuel cell applications

Graduated: **2006**

Ahmed, Tamer

Thesis: Copolymerization of vinylidene Fluoride with Hexafluoropropylene in supercritical carbon dioxide

Graduated: **2007**

Gratton, Stephanie

Thesis: In vitro and in vivo studies of nanomolded PRINT particles of precisely controlled size, shape, and surface chemistry

Graduated: **2008**

Kelly, Jennifer

Thesis: Novel fluoroelastomers composed of tetrafluoroethylene and vinylidene fluoride oligomers synthesized in carbon dioxide for use in soft lithography to enable a platform for the fabrication of shape- and size-specific, monodisperse biomaterials.

Graduated: **2008**

Herlihy, Kevin

Thesis: Shape and size specific: Fabrication, characterization, and application of highly tailored biocompatible hydrogel particles for use in materials and biomedical settings

Graduated: **2009**

Hu, Zhaokang

Thesis: Novel perfluoropolyethers as fouling-release coatings

Graduated: **2009**

Enlow, Elizabeth

Thesis : Engineering PLGA particles for advanced drug delivery

Graduated: **2010**

Hampton, Meredith

Thesis: Nano-patterning of inorganic materials for photovoltaic applications

Graduated: **2010**

Nunes, Janine

Thesis: Controlled manipulation of engineered colloidal particles

Graduated: **2010**

Williams, Stuart

Thesis: Nanopatterning with PFPE elastomers: Materials and photovoltaic applications
Graduated: **2010**

Yadav, Rameshwar

Thesis: Chemically crosslinked polymer electrolyte membranes from fluorinated liquid precursors for application in fuel cells
Graduated: 2010

Merkel, Timothy

Thesis: Biologically Inspired PRINT particles: Design, Fabrication, in vitro and in vivo evaluations of extremely soft particles
Graduated: **2011**

Brosnan, Sarah

Thesis: Development of novel polyesters as unique biomaterials
Graduated: **2012**

McGowan, Chang, Kelly

Thesis: Targeted PRINT nanoparticles for effective cancer therapy
Graduated: **2012**

Dunn, Stuart

Thesis: Shape-specific hydrogel nanoparticles with defined composition & surface properties for gene silencing
Graduated: **2012**

Xu, Jing

Thesis: Precisely engineered protein-based PRINT particles for delivery of nucleic acids
Graduated: **2012**

Roberts, Reid

Thesis: Harnessing what lies within: Programming immunity with biocompatible devices to treat human disease
Graduated: **2013**

Chu, Kevin

Thesis: PRINT nanoparticle parameters to improve docetaxel PK/PD
Graduated: **2013**

Chen, Kai

Thesis: A biomimetic approach toward red blood cell substitutes based on PRINT hydrogels
Graduated: **2013**

Khodabandehlou, Khosrow

Thesis: Slowly-dissolving aqueous suspensions of functionalized protein antibody PRINT particles for therapeutic applications
Graduated: **2014**

Roode, Luke

Thesis: Sub-tumor distribution of PRINT nanoparticles and its application for nucleic acid delivery

Graduated: **2014**

Byrne, James

Thesis: Iontophoretic delivery of cytotoxic agents for the treatment of solid tumors

Graduated: **2014**

Kai, Marc P.

Thesis: Development and applications of a cisplatin-containing hydrogel nanoparticle

Graduated: **2014**

Fromen, Catherine A.

Thesis: Monodisperse, uniformly-shaped particles for controlled respiratory vaccine delivery

Graduated: **2014**

Mueller, Sarah

Thesis: Polymeric PRINT hydrogel nanoparticles as a delivery platform for subunit vaccine antigens and adjuvants

Graduated: **2014**

Shen, Tammy

Thesis: Development and characterization of PRINT particles as drug delivery vehicles in the lung

Graduated: **2014**

Reuter, Kevin

Thesis: PRINT nanoparticle parameters to improve docetaxel PK/PD

Graduated: **2015**

Wong, Dominica H. C.

Thesis: Perfluoropolyether-based electrolytes for lithium battery applications

Graduated: **2015**

Moga, Katherine A.

Thesis: Rapidly dissolvable PRINT microneedles for the transdermal delivery of therapeutics

Graduated: **2015**

B) Past M.S. Graduates

Givens, Ramone

Thesis: Step-growth polymerization in supercritical fluids

Graduated: **1997**

Jones, Tamara

Thesis: Synthesis for low dielectric solvents

Graduated: **1997**

Burke, Amy

Thesis: Step-growth polymerizations using supercritical carbon dioxide

Graduated: **1998**

Burns, Sonja
Thesis: Non-thesis
Graduated: **1999**

Saraf Manish
Thesis: Polymerization of vinylidene fluoride in supercritical carbon dioxide: Molecular weight distribution
Graduated: **2001**

Polley, Jennifer
Thesis: The carbon dioxide technology platform: From surfactants to microelectronics
Graduated: **2002**

Hicks, Randall, Evan
Thesis: Synthesis of Tetrafluoroethylene tetrapolymers in supercritical carbon dioxide
Graduated: **2003**

Exener, Ansley
Thesis: Experiments utilizing the new nanofabrication method PRINT
Graduated: **2005**

Traud, Ron
Thesis: Proton exchange membranes improved mechanical properties and direct membrane fabrication
Graduated: **2008**

Gao, Xin
Thesis: RNA-based drug delivery using PRINT nanoparticles
Graduated: **2009**

Hinson, William
Thesis: In vitro and in vivo studies of biodegradable thermoplastic PRINT particles of controlled size, shape, and formulation
Graduated: **2010**

Forman, Nicole
Thesis: PRINT particles for inhaled therapies
Graduated: **2011**

Fain, John
Thesis: PRINT nanoparticle design and fabrication for imaging application & delivery of antibiotic payloads
Graduated: **2012**

Mooney, Heather Joy
Thesis: Development of a PRINT nanoparticle platform for use in vaccine applications
Graduated: **2013**

C) Past Undergraduate Researchers

<u>Name</u>	<u>Position w/ DeSimone</u>	<u>Next Location</u>
Anderson, Chris	B.S. Chemistry	Caltech
Archuleta, Christine	B.S. Chemistry	World Pediatric Project
Askew, Kim	B.S. Chemistry	Medical School
Bhattacharya, Arjun	B.S. Math. Decision Sci./ Bio.	Graduate School
Batten, Heather	B.S. Chemistry	University of Massachusetts - Amherst
Berndt, Steve	B.S. Chemistry	NC Molding Company
Bertrand, Elizabeth	B.S. Chemistry	University of Montpellier
Brooks, Ryan	B.S. Exercise & Sport Sci.	Graduate School
Bulgin, Andrew	B.S. Chemistry	Medical School
Butcher, Eric	B.S. Pharmacy	Pharmacy School
Cangelosi, Michael	B.S. in Applied Sciences	Unknown
Detter, Matthew	B.S. Chemistry; Research Asst.	Duke University (MD/PhD program)
Dunn, Erin	B.S. Chemistry	Graduate School
Fakhouri, Sami	B.S. Chemistry	UMass – Polymer Science
Flannery, Tommy	B.A. Global Studies/ Chem. minor	Weill Cornell Medical College
Genova, Jennifer	B.S. Chemistry	Medical School
Glover, Rebecca	B.A. Chemistry	Dental School
Harbinson, Chris	B.S. Chemistry	Micell Technologies
Haynie, Mindy	B.S. Chemistry	Micell Technologies
Karkanawi, Sarah	B.S. Pharmacy	Pharmacy School
Killian, Susan	B.S. Chemistry	Northwestern University
King, Tiffany	B.S. Chemistry/ Mathematics	Univ. of Chicago (Dept. of Biochem. & Molec. Bio.)
Lee, William	B.S. Chem./ B.A. Economics	GSK
Lizotte, Jeremy	B.S. Chemistry	Virginia Tech
Marshall, Kelly	B.S. Chemistry	University of California - Berkeley
Mofrad, Peter	B.S. Chemistry	Medical School
Orgel, Ryan	B.S. Chemistry	Wake Forest University Medical School
Pickens, Andrew	B.S. Biochemistry	Medical School
Pollitis, Jeffery	B.S. Chemistry	University of Michigan
Portnow, Lauren	B.S. Chemistry	UNC-CH School of Medicine
Sailer, David	B.S. Biochemistry	UNC-CH Research Assistant & Lab Mgr
Seus, Allison	B.A. Chemistry	Graduate School
Short, Patrick	B.S. Applied Math./ Quant. Bio.	Univ. of Cambridge Ph.D. program
Snead, David	B.S. Chemistry	Graduate School
Smith, Renee	B.S. Chemistry	MIT Graduate School
Stranko, Matt	B.S. Chemistry	Medical School
Sullivan, David	B.S. Chemistry	Graduate School
Thompson, Drew	B.S. Chemistry	University of California – Berkeley
Trecek, John	B.S. Chemistry	Medical School
Weston, Ken	B.S. Chemistry	University of California – Santa Barbara
White, Jesse	B.S. Chemistry	Architecture School

D) Past Postdoctoral Researchers and Staff

<u>Name</u>	<u>Position w/ DeSimone</u>	<u>Next Location</u>
Andre, Pascal	Postdoc	Industry in France
Archibald, Scott	Postdoc	UniRoyal
Barliya, Tilda	Postdoc	Rabin Medical Center
Bessel, Carol	Sabbatical Leave	Villanova
*Bickford, Lissett	Postdoc	Asst. Prof. VA Tech
Blake, Steven	Postdoc	Postdoc at MIT
Bowerman	Postdoc; Research Assoc.	Moderna Therapeutics
Brannen, Candice	Postdoc	Lord Corporation
Buhler, Eric	Postdoc	CNRS – Grenoble, France
Cha, Junhoe	Postdoc	University of Singapore
Chernyak, Yuri	Postdoc NCSU	Huntsman Chemical Company, RTI
* Charpentier, Paul	Postdoc NCSU	Univ. of Western Ontario
Cheung, Roland	Postdoc	Octopus (Netherlands)
* Choi, Jai-Pil	Postdoc	Professor, California State University, Fresno
Combes, Jimmy	Postdoc	Xerox Research Centre of Canada
Conwell, Christine	Postdoc	Consulting
* Cooper, Andy	Postdoc	Cambridge University, Liverpool
Dardin, Alex	Postdoc	RohMax
* Davidson, Tammy	Postdoc	Middle Tennessee State
Dessipri, Geni	Postdoc	ARI - Greece
DeYoung, James	Postdoc	Micell Technologies
Dominey, Raymond	Sabbatical Leave	University of Richmond
Du, Libin	Postdoc	Lubrizol
DuPont, Julie	Postdoc	Organic Synthesis Company
Elsesser, Mark	Postdoc	Science Policy Fellow, State of CA
Ermoshkin, Alexander	Postdoc	Liquidia Technologies
Ertas, Merve	Postdoc	Wright-Patterson AFRL
Eulis, Larken	Postdoc	Postdoc, Department of Radiology, UNC-CH
Finniss, Mathew	Research Assistant	Dalhousie University (Medical School)
Galloway, Ashley	Postdoc	Liquidia Technologies
Gavrilov, Kseniya	Postdoc	Triangle Insights Group
Goodner, Mike	Postdoc	Intel
Gullapalli, Anuradha	Research Specialist	Return to India
Guo, Ji	Postdoc	FDA
Hasan, Warefta	Postdoc	AuraSense Therapeutics
Herman, Delores	Postdoc	Duke Law School
Hsiao, Yu-Ling	Postdoc	Bayer
Jeong, Wonhee	Postdoc	LG (Korea)
Jikei, Mishi	Postdoc	Tokyo Institute of Technology
* Kadla, John	Visiting Scientist	NC State University
Kapellen, Kerstin	Postdoc	4P – Germany
Keiper, Jason	Postdoc	Stepan
Kendall, Jonathan	Postdoc	Lord Corporation
Kersey, Farrell	Postdoc	UNC-CH
*Lee, Dongil	Postdoc (Joint with Murray)	Asst. Professor, Western Michigan University

Lemert, Rich	Postdoc	Consultant
Lin, Jun	Postdoc	Consultant
Luft, Chris	Senior Research Associate	Liquidia
* Ma, Da	Postdoc	Fudan University
Maier, Gerhard	Postdoc	Technische Universitat Muenchen
Maynor, Ben	Postdoc	Liquidia Technologies
* Menciloglu, Yusuf	Postdoc	Gemsan - Turkey
Michel, Udo	Postdoc	Degussa Stockhausen
Murphy, Andrew	Postdoc	Liquidia Technologies
Napier, Mary	Research Assoc. Prof./Proj. Mgr.	Exec. Dir., Kenan Inst. of Private Enterprise (UNC)
Ni, Yizeng	Postdoc	Supelco
O'Neill, Adrian	Postdoc	Quintiles
Paisner, Sara	Postdoc	GE Plastics
Pandya, Ashish	Lab Mgr. and Sr. Res. Ass.	Science House
* Parrott, Matthew	Postdoc	Assistant Prof., UNC SOM, Dept. of Radiology
* Petros, Rob	Postdoc	University of North Texas
Pillai, Jonathan	Postdoc	Stanford-India Biodesign Fellowship
Pohlhaus, Patrick	Postdoc	Liquidia
Poppe, Dirk	Postdoc	Industry in Germany
Powell, Kim	Postdoc	Savannah River
Quadir, Murat	Postdoc/Lab Manager	Nalco
Robbins, Greg	Research Associate	Carbon3D, Inc.
Savage, John	Postdoc	Liquidia (right?)
Schorzman, Derek	Postdoc	Bausch and Lomb
* Shaffer, Katherine	Postdoc	Wayne State College
Shi, Chunmei	NCSU Postdoc	NCSU Postdoc w/ Roberts
Shiho, Hiroshi	Visiting Scientist	JSR Corporation
Stewart, Gina	Postdoc	Micell Technologies, Consultant
* Taylor, Darlene	STC Tech. Coordinator	Assist. Prof. NC Central University
Wang, Danni	Postdoc	Supelco
Wang, Jie-Yu	Postdoc	Beijing University
* Wang, Jin	Postdoc	Assist. Prof. Baylor College of Medicine
Wang, Ke	Postdoc (w/ Carbonell)	Guidant Corporation
* Wang, Yapei	Postdoc	Professor, Renmin University
Wei, Han-Chao	Postdoc	Exfluor Incorporated
Wojckinski, Lou	Postdoc	Postdoc, Univ. of Kentucky
Wood, Colin	Postdoc	Researcher at University of Liverpool
Yarbrough, Jason	Postdoc	Sealed Air Corporation
* Yoshida, Eri	Postdoc	Assistant Professor – Kyoto University
Zhang, Hanjun (Henry)	Postdoc	Postdoc at LBNL