

**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:**

New 3D Printing strategies; 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; Role of diversity in innovation; Entrepreneurship from research-intensive universities; Public – private partnerships.

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**Websites:**

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

**Personal Information:**

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

**Education:**

B.S. 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, Carbon, Inc., 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:**

- **2018 National Academy of Sciences Award for Convergent Science**
- **2017 Heinz Award** in the Technology, the Economy and Employment category
- 2017 Faculty Service Award, University of North Carolina General Alumni Association
- 2017 Frost & Sullivan Manufacturing Leadership Award for Visionary Leadership
- **National Medal of Technology and Innovation**, the highest honor in the United States for achievement and leadership in advancing technological progress, presented by President Barack Obama in 2016
- 2016 University Distinguished Achievement Award, Virginia Tech
- **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 100<sup>th</sup> 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 CO<sub>2</sub> 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 CO<sub>2</sub>) 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:

- *2018 Wilhelm Lecture*, Princeton University
- *2018 W. N. Lacey Lectureship in Chemical Engineering*, Caltech
- *2017 Fred Kavli Distinguished Lectureship in Materials Science*, Materials Research Society (MRS)
- *2016 Distinguished Lecturer*, RTI International
- *2016 Butler Lectureship in Polymer Chemistry* at the University of Florida

- 2015 Maroney-Bryan Distinguished Lecture, UC-Davis
- 2015 38<sup>th</sup> Annual Carl F. Schmidt Lecture, University of Pennsylvania School of Medicine
- 2015 27<sup>th</sup> 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, 10<sup>th</sup> Annual Oncology Research Symposium at MIT's Koch Institute for Integrative Cancer Research (2010)
- 2009 Ulliot 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 65<sup>th</sup> 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 Lambda 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, 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**

- Carbon, Inc. (<http://www.carbon3d.com>); Co-founder with Alex Ermoshkin and Edward Samulski. Carbon 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 CO<sub>2</sub> for microelectronics fabrication and high performance low surface energy coatings. Micell also pioneered and launched the first liquid CO<sub>2</sub>-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 CO<sub>2</sub> 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.



**Refereed Publications:**

(DeSimone has nearly 37,000 citations to his work as measured by *Google Scholar* in Jan. 2019; DeSimone's Hirsch Index "*h-Index*" = 91, that is he has 91 publications with 91 or more citations; see Hirsch, J. E. *Proc. Nat. Acad. Sci.* **2005**, *46*, 16569)

1. "3D printed absorber for capturing chemotherapy drugs before they spread through the body"; Oh, H. J.; Aboian, M. S.; Yi, M. Y. J.; Maslyn, J. A.; Loo, W. S.; Jiang, X.; Parkinson, D. Y.; Wilson, M. W.; Moore, T.; Yee, C. R.; Robbins, G. R.; Barth, F. M.; DeSimone, J. M.; Hetts, S. W.; Balsara, N. P. *ACS Cent. Sci.* **2019**, Article ASAP DOI: 10.1021/acscentsci.8b00700.
2. "Spatially controlled coating of continuous liquid interface production microneedles for transdermal protein delivery"; Caudill, C. L.; Perry, J. L.; Tian, S.; Luft, J. C.; DeSimone, J. M. *J. Control. Release* **2018**, *284*, 122-132.
3. "Use of iontophoresis for the treatment of cancer"; Byrne, J. D.; Yeh, J. J.; DeSimone, J. M. *J. Control. Release* **2018**, *284*, 144-151.
4. "Formulation of high-performance dry powder aerosols for pulmonary protein delivery"; Wilson, E. M.; Luft, J. C.; DeSimone, J. M. *Pharmaceutical Research* **2018**, *35*, 195.
5. "Controlling release from 3D printed medical devices using CLIP and drug-loaded liquid resins"; Bloomquist, C. J.; Mecham, M. B.; Paradzinsky, M. D.; Januszewicz, R.; Warner, S. B.; Luft, J. C.; Mecham, S. J.; Wang, A. Z.; DeSimone, J. M. *J. Control. Release* **2018**, *278*, 9-23.
6. "Nanoparticle delivery of a tetravalent E protein subunit vaccine induces balanced, type-specific neutralizing antibodies to each dengue virus serotype"; Metz, S. W.; Thomas, A.; Brackbill, A.; Xianwen, Y.; Stone, M.; Horvath, K.; Miley, M. J.; Luft, J. C.; DeSimone, J. M.; Tian, S. M.; de Silva, A. M. *PLoS Neglected Tropical Diseases* **2018**, *12*, e0006793.
7. "Impact of formulation on the iontophoretic delivery of the FOLFIRINOX regimen for the treatment of pancreatic cancer"; Byrne, J. D.; Jajja, M. R. N.; O'Neill, A. T.; Schorzman, A. N.; Keeler, A. W.; Luft, J. C.; Zamboni, W. C.; DeSimone, J. M.; Yeh, J. *J. Cancer Chemotherapy and Pharmacology* **2018**, *81*, 991-998.
8. "Optimization of Surface Display of DENV2 E Protein on a Nanoparticle to Induce Virus Specific Neutralizing Antibody Responses"; Coffman, J. E.; Metz, S. W.; Brackbill, A.; Paul, M.; Miley, M. J.; DeSimone, J. M.; Luft, C. J.; de Silva, A.; Tian, S. *Bioconjugate Chemistry* **2018**, *29*, 1544-1552.
9. "Extending antigen release from particulate vaccines results in enhanced antitumor immune response"; Kapadia, C. H.; Tian, S.; Perry, J. L.; Sailer, D.; Luft, J. C.; DeSimone, J. M. *J. Control. Release* **2018**, *269*, 393-404.
10. "Crosslinked perfluoropolyether solid electrolytes for lithium ion transport"; Devaux, D.; Villaluenga, I.; Bhatt, M.; Shah, D.; Chen, X. C.; Thelen, J.L.; DeSimone, J. M.; Balsara, N.P. *Solid State Ion.* **2017**, *310*, 71-80. (# of citations = 7)
11. "Antigen-capturing nanoparticles improve the abscopal effect and cancer immunotherapy"; Min, Y. Z.; Roche, K. C.; Tian, S. M.; Eblan, M. J.; McKinnon, K. P.; Caster, J. M.; Chai, S. J.; Herring, L. E.; Zhang, L. Z.; Zhang, T.; DeSimone, J. M.; Tepper, J. E.; Vincent, B. G.; Serody, J. S.; Wang, A. Z. *Nature Nanotechnology* **2017**, *12*(9), 877-882. (# of citations = 62)
12. "Mechanism of ion transport in perfluoropolyether electrolytes with a lithium salt"; Timachova, K.; Chintapalli, M.; Olson, K. R.; Mecham, S. J.; DeSimone, J. M.; Balsara, N. P. *Soft Matter* **2017**, *13*(32), 5389-5396. (# of citations = 6)



13. "Incipient microphase separation in short chain perfluoropolyether-block-poly(ethylene oxide) copolymers"; Chintapalli, M.; Timachova, K.; Olson, K. R.; Banaszak, M.; Thelen, J. L.; Mecham, S. J.; DeSimone, J. M.; Balsara, N. P. *Soft Matter* **2017**, 13(22), 4047-4056. (# of citations = 3)
14. "Mediating Passive Tumor Accumulation through Particle Size, Tumor Type, and Location"; Perry, J. L.; Reuter, K. G.; Luft, J. C.; Pecot, C. V.; Zamboni, W.; DeSimone, J. M. *Nano Letters* **2017**, 17(5), 2879-2886. (# of citations = 33)
15. "Effect of Anion Size on Conductivity and Transference Number of Perfluoroether Electrolytes with Lithium Salts"; Shah, D. B.; Olson, K. R.; Karny, A.; Mecham, S. J.; DeSimone, J. M.; Balsara, N. P. *J. Electrochem. Soc.* **2017**, 164(14), A3511-A3517. (# of citations = 2)
16. "Docetaxel-Loaded PLGA Nanoparticles Improve Efficacy in Taxane-Resistant Triple-Negative Breast Cancer"; Bowerman, C. J.; Byrne, J. D.; Chu, K. S.; Schorzman, A. N. Keeler, A. W.; Sherwood, C. A.; Perry, J. L.; Luft, J. C.; Darr, D. B.; Deal, A. M.; Napier, M. E.; Zamboni, W. C.; Sharpless, N. E.; Perou, C. M.; DeSimone, J. M. *Nano Letters* **2017**, 17(1), 242-248. (# of citations = 8)
17. "Co-opting Moore's law: Therapeutics, vaccines and interfacially active particles manufactured via PRINT®"; DeSimone, J. M. *J. Control. Release* **2016**, 240, 541-543. (# of citations = 5)
18. "Novel materials"; Rogers, J. A. & DeSimone, J. M. *Proc. Natl. Acad. Sci. USA* **2016**, 113(42), 11667-11669. (# of citations = 4)
19. "Layerless fabrication with continuous liquid interface production"; Januszewicz, R.; Tumbleston, JR; Quintanilla, AL; Mecham, SJ; DeSimone, JM. *Proc. Natl. Acad. Sci. USA* **2016**, 113(42), 11703-11708. (# of citations = 39)
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### **Funded Research Projects (Total grants raised: \$97,784,148)**

1. "Nano Approaches to Modulate Host Cell Response for Cancer Therapy: Project 2 – Nanoparticle-based Immune Modulators in Cancer Therapy & Vaccines," National Institutes of Health, \$440,489, 9/2015 – 7/2020
2. "University Cancer Research Fund"; \$175,000; 7/2010 – 6/2017
3. "Nanoparticle formulations of DNA repair inhibitors to improve chemoradiotherapy"; NIH/NCI; \$78,578; 8/2013 – 5/2018
4. "Preclinical Therapeutic Development for Multiple Sclerosis"; National Multiple Sclerosis Society; \$150,000; 4/2014 – 3/2019
5. "Collaborative Research: SusChEM: Perfluoroether-based Polymer Electrolytes for Lithium Batteries"; NSF; \$66,004; 9/2015 – 8/2018
6. "PRINT Butyrylcholinesterase Delivery"; \$4,477,660; 10/2013 – 9/30/2018
7. "Urinary Tract Infection Prevention and Spinal Cord Injury"; \$1,001,008; DeSimone Co-PI; 7/2013 – 6/2016

8. "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.
9. "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.
10. "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
11. "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
12. "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
13. "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
14. "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
15. "University Cancer Research Fund" Chapel Hill, NC, J.M. DeSimone (Co-PI), 2007-2011; \$1,200,000
16. "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
17. "EAGER: Meso-Polymers" NSF Research, Chapel Hill, NC, J.M. DeSimone (PI), 5/1/2009-4/30/2011; DMR-0923604 ; 554766; \$278,973
18. "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
19. "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
20. "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
21. "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
22. "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
23. "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



24. "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
25. "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.
26. "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
27. "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
28. "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
29. "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
30. "Targeted Delivery Via Protein-Carbohydrate Interactions", National Cancer Institute, Chapel Hill, NC, J.M. DeSimone (PI), 12/1/2000-2/2/2007; \$43,996
31. "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
32. "Microfluidic Devices - Aaryn Jones Scholarship" US Environmental Protection Agency, Chapel Hill, NC, J.M. DeSimone (PI), 9/8/2003-9/8/2006; \$264,030
33. "Supported Research Agreement with Synecor", Synecor, Chapel Hill, NC, J.M. DeSimone (PI), 5/1/2005-4/30/2006; \$37,284
34. "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
35. "Processing for sub-micron imaging on supercritical CO<sub>2</sub>: 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
36. "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
37. "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
38. "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

39. "Nitoxide Assisted Living Free Radical Polymerization of Block Copolymers in Supercritical CO<sub>2</sub>. Characterization by Light Scattering Techniques" NSF Training, Chapel Hill, NC, J.M. DeSimone (PI), 7/1/2001-6/30/2004; \$13,080
40. "New Materials for Solvent and Chemically Resistant Microfluidic Devices with Tailored Surface Functionalities" Subcontract from University of California, Chapel Hill, NC, J.M. DeSimone (PI), 10/1/2004-12/31/2004; \$185,000
41. "Kenan Center for the Utilization of CO<sub>2</sub> 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
42. "Very Low Surface Energy Heterophase Polymeric Materials for Membranes" North Carolina State University, Chapel Hill, NC, J.M. DeSimone (PI), 3/1/2000-11/30/2002; 546754; 94-0574-01\$145,000
43. "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
44. "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
45. "Presidential Faculty Fellow Award", 5-37123; DMR-9350334NSF, Chapel Hill, NC, J.M. DeSimone (PI), 8/15/1993-1/31/1998; \$337,500
46. "NSF Young Investigator's Award" ; 537048; DMR-9258571Chapel Hill, NC, J.M. DeSimone (PI), 8/15/1992-1/31/1995, \$100,000
47. "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
48. "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.

7. **US Patent 5,410,013**; April 25, 1995; "Thiophene-containing Poly(arylene ether) Sulfones"; Inventors - E. T. Samulski and J. M. DeSimone.
8. **US Patent 5,420,224**; May 30, 1995; "Thiophene-based Polymers: Polybenzoxazoles"; Inventors - E. T. Samulski and J. M. DeSimone.
9. **US Patent 5,382,623**; January 17, 1995; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
10. **US Patent 5,514,759**; May 7, 1996; "Multi-phase Polymerization Process"; Inventors - J. M. DeSimone, T. J. Romack.
11. **US Patent 5,451,633**; September 19, 1995; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Menciloglu, J. R. Combes.
12. **US Patent 5,506,317**; April 9, 1996; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
13. **US Patent 5,527,865**; June 18, 1996; "Multi-phase Polymerization Process"; Inventors - J. M. DeSimone, T. J. Romack.
14. **US Patent 5,530,077**; June 25, 1996; "Multi-phase Polymerization Process"; Inventors - J. M. DeSimone, T. J. Romack.
15. **US Patent 5,561,216**; October 1, 1996; "Late Transition Metal Catalysts for the Co- and Terpolymerization of Olefins and Alkyne Monomers with Carbon Monoxide"; Inventors - J. C. Barborak, M. S. Brookhart, and J. M. DeSimone.
16. **US Patent 5,589,105**; December 31, 1996; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
17. **US Patent 5,618,894**; April 8, 1997; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
18. **US Patent 5,639,836**; June 17, 1997; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
19. **South African Patent 96/4546**; February 26, 1997; "Process for the Preparation of Polyester in Carbon Dioxide"; Inventors: J. M. DeSimone and Gerhard Maier.
20. **US Patent 5,674,957**; October 7, 1997; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
21. **US Patent 5,679,737**; October 21, 1997; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
22. **US Patent 5,672,667**; September 30, 1997; "Multi-phase Polymerization Process"; Inventors - J. M. DeSimone, T. J. Romack.
23. **US Patent 5,688,879**; November 18, 1997; "Method of Making Fluoropolymers in Carbon Dioxide"; Inventor - J. M. DeSimone.
24. **US Patent 5,739,223**; April 14, 1998; "Method of Making Fluoropolymers in Carbon Dioxide"; Inventor - J. M. DeSimone.
25. **US Patent 5,780,553**; July 14, 1998; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
26. **US Patent 5,783,082**; July 21, 1998; "Novel Cleaning Process Using Carbon Dioxide as a Solvent and Employing Molecularly Engineered Surfactants"; Inventors - J. M. DeSimone, T. J. Romack, J. B. McClain, D. E. Betts.

27. **US Patent 5,824,726**; October 20, 1998; "Multi-phase Polymerization Process"; Inventors - J. M. DeSimone, T. J. Romack.
28. **US Patent 5,840,820**; November 24, 1998; "Olefin Metathesis Reactions in Carbon Dioxide"; Inventors - J. M. DeSimone, C. Mistele.
29. **US Patent 5,855,819**; January 5, 1999; "Synthesis of Conductive Polymers in Liquid and Supercritical Carbon Dioxide"; Inventors - J. M. DeSimone, Yizeng Ni.
30. **US Patent 5,860,467** January 19, 1999; "Use of CO<sub>2</sub>-Soluble Materials in Making Molds"; Inventors - J. M. DeSimone, Esin Gulari, Charles Menke; Filed: December 3, 1996.
31. **US Patent 5,863,612** January 26, 1999; "Method of Making Fluoropolymers in Carbon Dioxide"; Inventor - J. M. DeSimone; Filed: February 7, 1997.
32. **US Patent 5,866,005**; February 2, 1999; "Novel Cleaning Process Using Carbon Dioxide as a Solvent and Employing Molecularly Engineered Surfactants"; Inventors – J. M. DeSimone, T. J. Romack, J. B. McClain, D. E. Betts.
33. **US Patent 5,872,157**; February 12, 1999; "Method for Olefin Oxidation"; Inventors – J. M. DeSimone, T. J. Romack.
34. **US Patent 5,922,833** July 13, 1999; "Method of Making Fluoropolymers in Carbon Dioxide"; Inventor - J. M. DeSimone.
35. **US Patent 5,939,501**; August 17, 1999; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
36. **US Patent 5,939,502**; August 17, 1999; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
37. **US Patent 5,945,477**; August 31, 1999; "Process for the Preparation of Polyester in Carbon Dioxide"; Inventors: J. M. DeSimone and Gerhard Maier.
38. **US Patent 5,944,996**; August 31, 1999; "Novel Cleaning Process Using Carbon Dioxide as a Solvent and Employing Molecularly Engineered Surfactants"; Inventors – J. M. DeSimone, T. J. Romack, J. B. McClain, D. E. Betts.
39. **US Patent 5,977,292**; November 2, 1999; "Process for the Preparation of Polyester in Carbon Dioxide"; Inventors: J. M. DeSimone and Gerhard Maier.
40. **US Patent 5,981,673**; November 9, 1999; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
41. **United Kingdom Patent 2,315,755**; December 8, 1999; "Process for the Preparation of Polyester in Carbon Dioxide"; Inventors: J. M. DeSimone and Gerhard Maier.
42. **US Patent 6,001,418**; December 14, 1999; "Spin Coating Method and Apparatus for Liquid Carbon Dioxide Systems"; Inventors: J. M. DeSimone and Ruben Carbonell.
43. **US Patent 6,010,542**; January 4, 2000; "Method of Dyeing Substrates in Carbon Dioxide"; Inventors – J. DeYoung, James McClain, J. M. DeSimone, T. J. Romack.
44. **US Patent 6,025,459**; February 15, 2000; "Synthesis of Polyamides in Liquid and Supercritical Carbon Dioxide"; Inventors: J. M. DeSimone, Givens, R., Ni, L.

45. **Mexican Patent 196010**; April 14, 2000; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
46. **US Patent 6,083,565**; July 4, 2000; "Method for Meniscus Coating with Liquid Carbon Dioxide"; Inventors: J. M. DeSimone, Ruben Carbonell, Brian Novick.
47. **European Patent 96909747.6**; Aug. 3, 1996; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
48. **US Patent 6,107,443**; August 22, 2000; "Methods for Solid State Polymerizing Polyesters Utilizing Carbon Dioxide"; Inventors: J. M. DeSimone and Gerhard Maier.
49. **US Patent 6,127,000**; October 3, 2000; "Method and Compositions for Protecting Civil Infrastructure"; Inventors: R. G. Carbonell; J. M. DeSimone; F. E. Henon.
50. **German Patent DE 696 09 168.2-08**; July 5, 2000; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
51. **German Patent DE 69625092.6**; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
52. **Italian Patent IT 69846BE/2000**; July 5, 2000; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
53. **Italian Patent 813548**; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
54. **Italian Patent 957113**; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
55. **United Kingdom Patent GB 0 813 548**; July 5, 2000; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
56. **British Patent 957113**; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
57. **French Patent FR 0 813 548**; July 5, 2000; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
58. **French Patent 957113**; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
59. **Dutch Patent 957113**; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
60. **US Patent 6,176,895**; January 23, 2001; "Polymers for Metal Extractions in Carbon Dioxide"; Inventors-J. M. DeSimone and S. Crette.
61. **US Patent 6,211,422**; April 3, 2001; "Enzyme Catalysis in Carbon Dioxide Fluids"; Inventors: J. M. DeSimone, R. Carbonell
62. **US Patent 6,224,774**; May 1, 2001; "Method of Entraining Solid Particulates in Carbon Dioxide Fluid"; Inventors: J. M. DeSimone, T. Romack, J. B. McClain, D. E. Betts
63. **US Patent 6,240,936**; June 5, 2001; "Methods of Spin Cleaning Substrates Using Carbon Dioxide Liquids"; Inventors: J. M. DeSimone and Ruben Carbonell.
64. **US Patent 6,248,136**; June 19, 2001; "Method for Carbon Dioxide Dry Cleaning with Integrated Distribution"; Inventors: J. M. DeSimone, T. Romack, J. B. McClain, J. DeYoung, R. B. Lienhart, K. Huggins.
65. **US Patent 6,288,202**; September 11, 2001; "Synthesis of Polycarbonates Using Carbon Dioxide"; Inventors: J. M. DeSimone, R. Givens, M. Jikei, J. D. Cohen.

66. **US Patent 6,298,902**; October 9, 2001; "Use of CO<sub>2</sub>-Soluble Materials in Making Molds"; Inventors: J. M. DeSimone, Esin Gulari, Charles Menke.
67. **US Patent 6,332,342**; December 25, 2001; "Method for Carbon Dioxide Dry Cleaning with Integrated Distribution"; Inventors: J. M. DeSimone, T. Romack, J. B. McClain, J. DeYoung, R. B. Lienhart, K. Huggins.
68. **US Patent 6,383,289**; May 7, 2002; "Apparatus for Liquid Carbon Dioxide Systems"; Inventors: J. M. DeSimone and R Carbonell.
69. **US Patent 6,403,663**; June 11, 2002; "Method of Making Foamed Materials Using Surfactants and Carbon Dioxide"; Inventors: J. M. DeSimone and R Carbonell.
70. **US Patent 6,426,391**; July 30, 2002; "Fluorination in Liquid and Supercritical Carbon Dioxide"; Inventors - J.M. DeSimone, T.J. Romack.
71. **US Patent 6,451,287**; September 17, 2002; "Fluorinated Copolymer Surfactants and Use Thereof in Aerosol Compositions"; Inventors: J. M. DeSimone, Terri Johnson Carson, John Miller, Sharon Wells.
72. **Canadian Patent 2,168,423**; July 9, 2002; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
73. **European Patent 0638095** July 8, 2002; "Method of Making Fluoropolymers"; Inventor - J. M. DeSimone.
74. **Mexican Patent 206607**; February 8, 2002; "Multi-phase Polymerization Process"; Inventors - J. M. DeSimone, T. J. Romack.
75. **US Patent 6,497,921**; December 24, 2002; "Method for Meniscus Coating with Liquid Carbon Dioxide"; Inventors: J. M. DeSimone, Ruben Carbonell, Brian Novick.
76. **US Patent 6,500,273**; December 31, 2002; "Spin Cleaning Methods"; Inventors: J. M. DeSimone and Ruben Carbonell.
77. **US Patent 6,512,062**; January 28, 2003; "Polymerization of Non-Fluorinated Monomers in Carbon Dioxide"; Inventors: J. M. DeSimone, T. J. Carson, H. Shiho, J. Lizotte.
78. **US Patent 6,517,633**; February 11, 2003; "Apparatus for Meniscus Coating with Liquid Carbon Dioxide"; Inventors: J. M. DeSimone, Ruben Carbonell, Brian Novick.
79. **US Patent 6,623,355**; September 23, 2003; "Methods, apparatus and slurries for Chemical Mechanic Planarization; Inventors: J.B. McClain, J. DeYoung, J. M. DeSimone
80. **European Patent 1126925**; Issued: Sept. 10, 2003; "Method and apparatus for coating with liquid or supercritical carbon dioxide"; Inventors: R. G. Carbonell, J. M. DeSimone, B. J. Novick.
81. **US Patent 6,641,678**; November 4, 2003; "Methods for Cleaning Microelectronic Device Structures with Aqueous Carbon Dioxide Systems; Inventors: J.B. McClain, J. DeYoung, S. Gross, J. M. DeSimone
82. **Japanese Patent 3,476,016**; September 26, 2003; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes
83. **US Patent 6,652,920**; November 25, 2003; "Method for Meniscus Coating a Substrate with a Polymeric Precursor"; Inventors: J. M. DeSimone, Ruben Carbonell, Brian Novick
84. **Chinese Patent CN1100797C**; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.
85. **US Patent 6,684,525**; February 3, 2004; "Phosphate Fluorosurfactants in Carbon Dioxide"; Inventors - J. M. DeSimone; J. Keiper.



86. **Japanese Patent 3512796**, January 16, 2004; "Method of Making Fluoropolymers in Carbon Dioxide"; Inventor - J. M. DeSimone.
87. **US Patent 6,716,945**; April 6, 2004; "Multimodal Fluoropolymers and Methods of Making the Same"; Inventors - J. M. DeSimone; George Roberts, Paul Charpentier.
88. **European Patent 0711311**; October 15, 2003; "Heterogeneous Polymerizations in Carbon Dioxide"; Inventors - J. M. DeSimone, E. E. Maury, Y. Z. Menciloglu, J. R. Combes.
89. **US Patent 6,736,996**; May 18, 2004; "Compositions for Protecting Civil Infrastructure"; Inventors: R. G. Carbonell; J. M. DeSimone; F. E. Henon.
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170. **US Patent 8,992,992**; Issued: Mar. 31, 2015; "Methods for fabricating isolated micro- or nano-structures using soft or imprint lithography"; Inventors: J. M. DeSimone, J. P. Rolland, B. W. Maynor, L. E. Euliss, G. D. Rothrock, A. E. Dennis, E. T. Samulski, R. J. Samulski.
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172. **US Patent 9,205,601**; Issued: Dec. 8, 2015; "Continuous liquid interphase printing"; J. M. Desimone, A. Ermoshkin, N. Ermoshkin., E. T. Samulski.
173. **US Patent 9,211,678**; Issued: Dec. 15, 2015; "Method and apparatus for three-dimensional fabrication"; Inventors: J. M. DeSimone, A. Ermoshkin, N. Ermoshkin., E. T. Samulski.
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175. **US Patent 9,216,546**; Issued: Dec. 22, 2015; "Method and apparatus for three-dimensional fabrication with feed through carrier"; Inventors: J. M. Desimone, A. Ermoshkin, N. Ermoshkin., E. T. Samulski.

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179. **European Patent 2956822**; Issued: June 28, 2016; "Method and apparatus for three-dimensional fabrication with feed through carrier"; Inventors: J. M. Desimone, A. Ermoshkin, N. Ermoshkin., E. T. Samulski.
180. **European Patent 2956823**; Issued: June 29, 2016; "Continuous liquid interphase printing"; Inventors: J. M. Desimone, A. Ermoshkin, N. Ermoshkin., E. T. Samulski.
181. **US Patent 9,381,158**; Issued: July 5, 2016; "Nanoparticle fabrication methods, systems, and materials for fabricating artificial red blood cells"; Inventors: J. M. DeSimone, E. T. Samulski.
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183. **US Patent 9,453,142**; Issued: Sept. 27, 2016; "Polyurethane resins having multiple mechanisms of hardening for use in producing three-dimensional objects"; Inventors: J. P. Rolland, K. Chen, J. Poelma, J. Goodrich, R. Pinschmidt, J. M. DeSimone, L. Robeson.
184. **US Patent 9,457,098**; Issued: October 4, 2016; "Asymmetric bifunctional silyl monomers and particles thereof as prodrugs and delivery vehicles for pharmaceutical, chemical and biological agents"; Inventors: J. M. DeSimone, M. Finniss, M. Napier, A. Pandya, M. Parrott.
185. **US Patent 9,498,920**; Issued: Nov. 22., 2016; "Method and apparatus for three-dimensional fabrication"; J. M. DeSimone, A. Ermoshkin, E. T. Samulski.
186. **Australian Patent 2010217957**; Issued: Nov. 26, 2016; "Interventional Drug Delivery System and Associated Methods"; Inventors: J. M. DeSimone, J. D. Byrne, M. E. Napier, M. Parrott, J. Pillai, L. Roush, J. J. Yeh.
187. **European Patent 1704585**; Issued: Mar. 15, 2017; "Methods for fabricating isolated micro- and nano- structures using soft or imprint lithography"; J. M. Desimone, J. P. Rolland, A. E. Exner, E. T. Samulski, R. J. Samulski, B. W. Maynor, L. E. Euliss, G. M. Denison.
188. **US Patent 9,598,606**; Issued: Mar. 21, 2017; "Methods of producing polyurethane three-dimensional objects from materials having multiple mechanisms of hardening"; J. P. Rolland, K. Chen, J. Poelma, J. Goodrich, R. Pinschmidt, J. M. DeSimone, L. M. Robeson.
189. **US Patent 9,676,963**; Issued: June 13, 2017; "Methods of producing three-dimensional objects from materials having multiple mechanisms of hardening"; J. P. Rolland, K. Chen, J. Poelma, J. Goodrich, R. Pinschmidt, J. M. DeSimone, L. M. Robeson.
190. **US Patent 9,724,305**; Issued: Aug. 8, 2017; "Nanoparticle fabrication methods, systems, and materials for fabricating artificial red blood cells"; J. M. DeSimone, E. T. Samulski.
191. **US Patent 9,748,604**; Issued: Aug. 29, 2017; "Ion conducting polymers and polymer blends for alkali metal ion batteries"; J. M. DeSimone, A. Pandya, D. H. C. Wong, A. Vitale.
192. **US Patent 9,755,273**; Issued: Sept. 5, 2017; "Ion conducting fluoropolymer carbonates for alkali metal ion batteries"; J. M. DeSimone, A. Pandya, D. H. C. Wong, N. P. Balsara, J. Thelen, D. Devaux.



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194. **US Patent 9,902,818**; Issued: Feb. 27, 2018; "Isolated and fixed micro and nano structures and methods thereof"; J. M. DeSimone, G. D. Rothrock, B. W. Maynor, J. P. Rolland.
195. **US Patent 9,975,295**; Issued: May 5, 2018; "Acceleration of stereolithography"; J. P. Rolland, J. M. DeSimone.
196. **US Patent 9,982,164**; Issued: May 29, 2018; "Polyurea resins having multiple mechanisms of hardening for use in producing three-dimensional objects"; J. P. Rolland, K. Chen, J. Poelma, J. Goodrich, R. Pinschmidt, J. M. DeSimone, L. M. Robeson.
197. **US Patent 9,993,974**; Issued: June 12, 2018; "Method and apparatus for three-dimensional fabrication"; J. M. DeSimone, A. Ermoshkin, E. T. Samulski.

### **Current Research Group (2018)**

<b><u>Name</u></b>	<b><u>Position</u></b>	<b><u>Previous Institution</u></b>
Caudill, Cassie	Postdoctoral Scholar	UNC-CH
Dunn, Stuart	Postdoctoral Scholar	Harvard Univ.
Iliadis, Kimon	Laboratory Assistant	UNC-CH
Mecham, Sue	Research Associate	Virginia Tech
Perry, Jillian	Research Associate	Univ. of Florida; Postdoc at UNC
Pinschmidt, Bob	Research Associate	UNC-CH
Tian, Shaomin	Research Assistant Professor	UNC-CH Microbiology
Tysinger, Matt	Laboratory Technician	Quality Chemical Laboratories / UNC
Wang, Ying	Postdoctoral Scholar	UNC-CH
Zhang, Rui	Postdoctoral Scholar	Virginia Tech.

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

- 75 Postdocs
- 58 Ph.D. Degrees in Chemistry
- 9 Ph.D. Degrees in Pharmaceutical Sciences
- 1 Ph.D. Degree in Biomedical Engineering
- 1 Ph.D. Degree in Microbiology & Immunology
- 13 Ph.D. Degrees in Chemical Engineering
- 13 M.S. Degrees in Chemistry
- 1 M.S. Degree in Chemical Engineering
- 25 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 CO<sub>2</sub>

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 CO<sub>2</sub>-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 CO<sub>2</sub>

Graduated: **2000**

\* Gross, Stephen

Thesis: Step-growth polymerizations facilitated by scCO<sub>2</sub>: 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 scCO<sub>2</sub>

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 scCO<sub>2</sub>

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 scCO<sub>2</sub> 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 CO<sub>2</sub> 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**

Johnson, Ashley R.

Thesis: Continuous Liquid Interface Production of Microneedles for Transdermal Drug Delivery

Graduated: **2016**

Kapadia, Chintan. H.

Thesis: Engineering PRINT Nanoparticle Subunit Vaccine to Induce Antitumor Immune Response

Graduated: **2016**

\*Rahhal, Tojan. B.

Thesis: Engineering PRINT Particles for Pulmonary Delivery of Therapeutics

Graduated: **2016**

Bloomquist, Cameron

Thesis: Continuous Liquid Interface Production of Medical Devices for Drug Delivery and Cancer Therapy

Graduated: **2017**

Caudill, Cassie

Thesis: Engineering Microneedles for the Transdermal Delivery of Therapeutics

Graduated: **2017**

Coffman, Jason

Thesis: Engineering Antigen Display for a PRINT Particulate Dengue Subunit Vaccine Platform

Graduated: **2017**

Olson, Kevin

Thesis: Nonflammable Perfluoropolyether Electrolytes for Safer Lithium-Based Batteries

Graduated: **2017**

Quintanilla, Adam

Thesis: Fundamentals of Particulate-Filled Polymer Composite via Continuous Liquid Interface Production

Graduated: **2017**

Wilson, Erin  
Thesis: Developing PRINT Dry Powders for Pulmonary Protein Delivery  
Graduated: **2017**

Januszewicz, Rima  
Thesis: Continuous Liquid Interface Production (CLIP) for the Fabrication of Porous Architected Structures  
Graduated: **2018**

### **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**

<b><u>Name</u></b>	<b><u>Position w/ DeSimone</u></b>	<b><u>Next Location</u></b>
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
Paradzinsky, Mark	B.S. Chemistry	Virginia Tech (for Ph.D.)
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**

<b><u>Name</u></b>	<b><u>Position w/ DeSimone</u></b>	<b><u>Next Location</u></b>
Andre, Pascal	Postdoc	Industry in France
Archibald, Scott	Postdoc	UniRoyal
Barliya, Tilda	Postdoc	Rabin Medical Center
Bessel, Carol	Sabbatical Leave	Villanova
Byrne, James	Postdoc (after Ph.D.)	UNC (M.D.); Harvard Radiation Oncology (residency)
*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
Haithcock, Vicki	Administrative Manager	Retired
Hasan, Warefta	Postdoc	AuraSense Therapeutics
Herman, Delores	Postdoc	Duke Law School
Huang, Lihong	Research Associate	South Carolina
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 / Premirr Plastics
* 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
* Min, Yuanzeng	Postdoc	Professor, U. of Science & Technology, China
Murphy, Andrew	Postdoc	Liquidia Technologies
Napier, Mary	Research Assoc. Prof./Proj. Mgr.	Exec. Dir., Kenan Inst. of Private Enterprise (UNC)
Nebipasagil, Ali	Postdoc	Formlabs
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	Carbon, Inc.

Savage, John	Postdoc	Liquidia
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
* Yi, Xianwen	Research Associate	UNC (Research Asst. Prof.)
* Yoshida, Eri	Postdoc	Assistant Professor – Kyoto University
Zhang, Hanjun (Henry)	Postdoc	Postdoc at LBNL