# *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.

## Contact Information:

Mail: Department of Chemistry
University of North Carolina at Chapel Hill
CB #3290 Caudill Laboratories
Chapel Hill, NC 27599-3290
desimone@unc.edu
Office: (919) 962-2166; Fax: (919) 962-5467

## Websites:

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

## Personal Information:

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

## Education:

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| 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:

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| 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:

- 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 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 $CO_2$ 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 $CO_2$) 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:

- *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 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 Ullyot 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

- Carbon, 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 $CO_2$ for microelectronics fabrication and high performance low surface energy coatings. Micell also pioneered and launched the first liquid $CO_2$-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 $CO_2$ 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:

(DeSimone has 20,000+ citations to his work as measured by *Science Citation Index* in May 2017; DeSimone's Hirsch Index "*h*-Index" = 69, that is he has 69 papers with 69 or more citations, see Hirsch, J. E. *Proc. Nat. Acad. Sci.* **2005**, *46*, 16569)

1. "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.

2. "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.

3. "Co-opting Moore's law: Therapeutics, vaccines and interfacially active particles manufactured via PRINT®"; DeSimone, J. M. *J. Control. Release* **2016**, *240*¸ 541-543.

4. "Novel materials"; Rogers, J. A. & DeSimone, J. M. *Proc. Natl. Acad. Sci. USA* **2016**, *113*(42), 11667-11669.

5. Layerless fabrication with continuous liquid interface production"; Janusziewicz, R.; Tumbleston, JR; Quintanilla, AL; Mecham, SJ; DeSimone, JM. *Proc. Natl. Acad. Sci. USA* **2016**, *113*(42), 11703-11708.

6. "Precisely Molded Nanoparticle Displaying DENV-E Proteins Induces Robust Serotype-Specific Neutralizing Antibody Responses"; Metz, S. W.; Tian, S.; Hoekstra, G.; Yi, X.; Stone, M.; Horvath, K.; Miley, M. J.; DeSimone, J. M.; Luft, C. J.; de Silva, A. M. *PLoS Neglected Tropical Diseases* **2016**, *10*, e0005071.

7. "Reduction sensitive PEG hydrogels for co-delivery of antigen and adjuvant to induce potent CTLs"; Kapadia, C. H.; Tian, S.; Perry, J. L.; Luft, J. C.; DeSimone, J. M. *Molecular Pharmaceutics* **2016**, *13*(10), 3381-3394.

8. "Organic Polymer Chemistry in the Context of Novel Processes"; DeSimone, J. M.; Mecham, S. J.; Farrell, C. L. *ACS Central Science* **2016**, *2*, 588-597.

9. "Liquid Perfluoropolyether Electrolytes with Enhanced Ionic Conductivity for Lithium Battery Applications"; Olson, K. R.; Wong, D. H. C.; Chintapalli, M.; Timachova, K.; Janusziewicz, R.; Daniel, W. F. M.; Mecham, S.; Sheiko, S.; Balsara, N. P.; DeSimone, J. M. *Polymer* **2016**, *100*, 126-133.

10. "Single-Step Fabrication of Computationally Designed Microneedles by Continuous Liquid Interface Production"; Johnson, A. R.; Caudill, C. L.; Tumbleston, J. R.; Bloomquist, C. J.; Moga, K. A.; Ermoshkin, A.; Shirvanyants, D.; Mecham, S. J.; Luft, J. C.; DeSimone, J. M. *PLoS ONE* **2016**, *11*(9): e0162518.

11. "Conductivity of carbonate- and perfluoropolyether-based electrolytes in porous separators"; Devaux, D.; Chang, Y. H.; Villaluenga, I.; Chen, X. C.; Chintapalli, M.; DeSimone, J. M.; Balsara, N. P. *Journal of Power Sources* **2016**, *323*, 158-165.

12. "Efficacy and pharmacokinetics of a modified acid-labile docetaxel-PRINT® nanoparticle formulation against non-small-cell lung cancer brain metastases"; Sambade, M.; Deal, A.; Schorzman, A.; Luft, J. C.; Bowerman, C.; Chu, K.; Karginova, O.; Van Swearingen, A.; Zamboni, W.; DeSimone, J. M.; Anders, C. K. *Nanomedicine (Lond.)* **2016**, *11*(15), 1947-1955. **(# of citations = 1)**

13. "Relationship between Conductivity, Ion Diffusion, and Transference Number in Perfluoropolyether Electrolytes"; Chintapalli, M.; Timachova, K.; Olson, K. R.; Mecham, S. J.; Devaux, D.; DeSimone, J. M.; Balsara, N. P. *Macromolecules* **2016**, *49*(9), 3508-3515. **(# of citations = 5)**

14. "Pulmonary Delivery of Butyrylcholinesterase as a Model Protein to the Lung"; Rahhal, T. B.; Fromen, C. A.; Wilson, E. M.; Kai, M. P.; Shen, T. W.; Luft, J. C.; DeSimone, J. M. *Molecular Pharmaceutics* **2016**, *13*(5), 1626-1635. **(# of citations = 0)**

15. "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. **(# of citations = 3)**

16. "Nanoparticle surface charge impacts distribution, uptake and lymph node trafficking by pulmonary antigen-presenting cells"; Fromen, C. A.; Rahhal, T. B.; Robbins, G. R.; Kai, M. P.; Shen, T. W.; Luft, J. C.; DeSimone, J. M. *Nanomedicine: Nanotechnology, Biology, and Medicine* **2016**, *12*(3), 677-687. **(# of citations = 8)**

17. "Particles for Local Delivery of Proteins Using Intra-Articular Route"; Khodabandehlou, K.; Tian, S.; Luft, J. C.; Khan, S. A.; DeSimone, J. M. *Adv. Healthc. Mater.* **2016**, *5*(6), 653-658. **(# of citations = 0)**

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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

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110. **US Patent 7,163,554**; Issued: Jan. 16, 2007; "Endoprostheses and methods of manufacture"; Inventors: M. S. Williams, R. A. Glenn, J. A. Smith, K. D. Holbrook, J. M. DeSimone.

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113. **Chinese Patent ZL98803810.2;** July 24, 2007; "Method of Making Fluoropolymers"; Inventors - J. M. DeSimone; Tim Romack.

114. **Japanese Patent 3996637**; August 10, 2007; "Non-aqueous Polymerization of Fluoromonomers"; Inventors - J. M. DeSimone, T. J. Romack.

115. **Japanese Patent 4036893**; November 9, 2007; "Multi-phase Polymerization Process"; Inventors - J. M. DeSimone, T. J. Romack.

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117. **European Patent 1172383;** April 16, 2008; "Method of Making Fluoropolymers"; Inventors - J. M. DeSimone.

118. **European Patent 1328610;** July 2, 2008; "Phosphate Fluorosurfactants for use in Carbon Dioxide"; Inventors - J. M. DeSimone; J. Keiper.

119. **US Patent 7,410,620;** August 12, 2008; "Apparatus for the Continuous Production of Polymers in Carbon Dioxide"; Inventors - J. M. DeSimone; George Roberts, Paul Charpentier.

120. **US Patent 7,435,495;** October 14, 2008; "Liquid Materials for Use in Electrochemical Cells"; Inventors - J. M. DeSimone; Zhilian Zhou.

121. **Brazilian Patent** PI0611827.5; Issued: Dec. 2, 2008; "Nanoparticle Fabrication Methods, Systems, and Materials"; Inventors: J. M. DeSimone, G. Denison, L. Euliss, A. Exner-Dennis, B. W. Maynor, J. P. Rolland, E. T. Samulski, R. J. Samulski.

122. **US Patent 7,641,828**; Issued January 5, 2010; Method of Making Orthodontic Appliances; Inventors: J. M. DeSimone and Robert E. Tricca

123. **US Patent 7,857,748;** December 28, 2010; "Photocurable Endoprostheses Methods of Manufacture": Inventors: Williams, M. S.;

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134. **Canadian Patent 2,503,393**; Issued: April 26, 2011; "Photo curable endoprosthesis and method of manufacture"; Inventors: M. S. Williams, R. A. Glenn, J. A. Smith, K. D. Holbrook, J. M. DeSimone

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142. **US Patent 8,152,843**; Issued: April 10, 2012; "Polymeric endoprosthesis and method of manufacture"; Inventors: M. S. Williams, K. D. Holbrook, R. A. Glenn, J. A. Smith, J. M. DeSimone.

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165. **Japanese Patent 5653942**; Issued: Nov. 28, 2014; "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.

166. **Japanese Patent 5656996**; Issued: Dec. 5, 2014; "Engineered Aerosol Particles, and Associated Methods'; Inventors: J. M. DeSimone, G. Denison-Rothrock, B. W. Maynor, J. P. Rolland, H. Zhang.

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169. **US Patent 8,945,527**; Issued: Feb. 3, 2015; "Degradable compounds and methods of use thereof, particularly with particle replication in non-wetting templates"; Inventors: J. M. DeSimone, M. Parrott, A. Murphy, R. A. Petros.

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.

171. **US Patent 9,040,090**; Issued: May 26, 2015; "Isolated and fixed micro and nano structures and methods thereof"; Inventors: J. M. DeSimone, G. Denison-Rothrock, B. W. Maynor, J. P. Rolland

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.

174. **US Patent 9,214,590**; Issued: Dec. 15, 2015; “High fidelity nano-structures and arrays for photovoltaics and methods of making the same”; Inventors: J. M. DeSimone, G. D. Rothrock, Z. Zhou, E. T. Samulski, M. Earl, S. Williams.

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.

176. **German Patent DE 13847827 T1**; Issued: March 10, 2016; “Ion-conducting polymers and polymer blends for alkali metal-ion batteries”; Inventors: J. M. DeSimone, A. Pandya, D. H. C. Wong, A. Vitale.

177. **US Patent 9,360,757**; Issued: Jun 7, 2016; Continuous liquid interphase printing”; Inventors: J. M. Desimone, A. Ermoshkin, N. Ermoshkin., E. T. Samulski.

178. **Canadian Patent 2,847,260**; Issued: June 21, 2016; “Methods for fabricating isolated micro- and nano- structures 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.

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.

182. **Canadian Patent 2611985**; Issued: Aug. 16, 2016; “Nanoparticle fabrication methods, systems, and materials”; Inventors: J. M. Desimone, J. P. Rolland, A. E. Dennis, E. T. Samulski, R. J. Samulski, B. W. Maynor, L. E. Euliss, G. Rothrock-Denison, S. Gratton, A. Ermoshkin, A. J. Murphy,

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.

## Current Research Group

| Name | Position | Previous Institution |
|---|---|---|
| Bloomquist, Cameron | Ph.D. Candidate, Pharmacy (exp 2018) | Clemson University |
| Caudill, Cassie | Ph.D. Candidate, Pharmacy (exp 2018) | Transylvania University |
| Coffman, Jason | Ph.D. Candidate at NCSU (exp 2018) | University of Delaware |
| Janusziewicz, Rima | Ph.D. Candidate, Chemistry (exp 2018) | James Madison University |
| 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) |
| 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 |
| 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
6 Ph.D. Degrees in Pharmaceutical Sciences
1 Ph.D. Degree in Biomedical Engineering
1 Ph.D. Degree in Microbiology & Immunology
11 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 $CO_2$
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 $CO_2$-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 $CO_2$
Graduated: **2000**

* Gross, Stephen
Thesis: Step-growth polymerizations facilitated by $scCO_2$: 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 amphilphilic 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 $scCO_2$
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 $scCO_2$ 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) trisbipyridly chromophores
Graduated: **2005**

Denison, Ginger
Thesis: Carbon dioxide based etchant solutions for copper chemical mechanicl 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 $CO_2$ 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: Nanopatterining 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**

## 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

| Name | Position w/ DeSimone | Next Location |
|---|---|---|
| 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) |

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|---|---|---|
| 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

| Name | Position w/ DeSimone | Next Location |
|---|---|---|
| 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 |

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|---|---|---|
| * Charpentier, Paul | Postdoc NCSU | Univ. of Western Ontario |
| Cheung, Roland | Postdoc | Octoplus (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 |
| * Ma, Da | Postdoc | Fudan University |
| Maier, Gerhard | Postdoc | Technische Universitat Muenchen |
| Maynor, Ben | Postdoc | Liquidia Technologies |
| * Menceloglu, 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 |

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|---|---|---|
| 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 Kentuckey |
| 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 |