Joseph M. DeSimone

Director, Frank Hawkins Kenan Institute of Private Enterprise
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:

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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
http://www.carolinaccne.unc.edu/

Personal Information:

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

Education:

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

Professional Positions:

2012 – present	Director, Kenan Institute of Private Enterprise, Kenan Flagler Business School
2010 – Present	Adjunct Member, Memorial Sloan Kettering Cancer Center and Sloan-Kettering Institute for Cancer Research
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
2008 – Present	Founding Director, Institute for Nanomedicine at UNC-CH
2005 – Present	Co-PI, Carolina Center of Cancer Nanotechnology Excellence
2005 – Present	Faculty Member, Lineberger Comprehensive Cancer Center and Dept. of Pharmacology, School of Medicine
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 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:

- **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.
- **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:

- *2014 Butler Lectureship in Polymer Chemistry* at the University of Florida
- *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://otd.unc.edu/starting_a_company.php#CaroExLic)
- 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:

- 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

- 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 Rockfeller University; Martin Murphy, former CEO of Hipple Cancer Center.
- EIPI Systems, Inc. (http://www.eipisystems.com); Co-founder with Alex Ermoshkin and Edward Samulski. EIPI 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 low-cost 3D printer market and high valued products for the medical device and pharmaceutical industries.
- 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, Leaf Huang, 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: Ben Maynor, Pete Mack, Peter Berglund and Frank Malinoski.

Refereed Publications and Recently Submitted Manuscripts:

(DeSimone has 12,300+ citations to his work as measured by *Science Citation Index* in November 2012; DeSimone's Hirsch Index "*h*-Index" = 57, that is he has 57 papers with 57 or more citations, see Hirsch, J. E. *Proc. Nat. Acad. Sci.* **2005**, *46*, 16569)

1. "RNA Replicon Delivery via Lipid-Complexed PRINT Protein Particles"; Xu, J.; Luft, J. C.; Yi, X.; Tian, S.; Owens, G.; Wang, J.; Johnson, A.; Berglund, P.; Smith, J.; Napier, M.; DeSimone, J. M. *Molecular Pharmaceutics* **2013**, in press.

2. "Nanoparticle Drug Loading as a Design Parameter to Improve Docetaxel Pharmacokinetics and Efficacy"; Chu, K. S.; Schorzman, A. N.; Finniss, M. C.; Bowerman, C. J.; Peng, L.; Luft, J. C.; Madden, A.; Wang, A. Z.; Zamboni, W. C.; DeSimone*, J. M. *Biomaterials* **2013**, in press.

3. "Nonflammable Perfluoropolyether-based Electrolytes for Lithium-ion Batteries"; Wong, D. H.C.; Thelen, J.; Fu, Y.; Devaux, D.; Pandya, A. A.; Battaglia, V.; Balsara, N. P.; DeSimone*, J. M.; Submitted to *PNAS*, **2013**.

4. "Rapidly-Dissolvable Microneedle Patches via a Highly Scalable and Reproducible Soft Lithography Approach"; Moga, K. A.; Bickford, L. R.; Geil, R. D.; Dunn, S. S.; Pandya, A. A.; Wang, Y.; Fain, J. H.; Archuleta, C. F.; O'Neill, A. T. O.; DeSimone*, J. M. *Advanced Materials* **2013**, in press.

5. "Synthesis and Characterization of Monodisperse Uniformly Shaped Respirable Aerosols"; Fromen, C. A.; Shen, T. W.; Larus, A. E.; Mack, P.; Luft, J. C.; Maynor, B. W.; DeSimone*, J. M. *AIChE Journal* **2013**, in press (Special Issue: Founders Tribute to Neal R. Amundson).

6. "Generating Better Medicines for Cancer"; Dunn, Stuart; Perry, Jillian; Chen, Kai; Byrne, James; DeSimone*, J. M.; *ACS Macro Letters* **2013**, in press.

7. "Nanoparticle clearance is governed by Th1/Th2 immunity and strain background"; Jones, S. W.; Roberts, R.; Robbins, G. R.; Perry, J. L.; Kai, M. P.; Chen, K.; Bo, T.; Napier, M.; Ting, J.P.Y.; DeSimone, J. M.; Bear*, J. E. *J. Clinical Investigation* **2013**, 123(7), 3061-3073.

8. "Analysis of the Murine Immune Response to Pulmonary Delivery of Precisely Fabricated Nano- and Microscale Particles"; Roberts, R. A.; Shen, T.; Allen, I. C.; Hasan, W.; DeSimone*, J. M.; Ting*, J, P-Y. *Plos One* **2013**, 8(4), e62115.

9. "The Future of the Particle Replication in Non-wetting Templates (PRINT) Technology"; Xu, J.; Wong, D. H. C.; Byrne, J. D. Chen, K.; Bowerman, C.; DeSimone*, J. M. *Angewandte Chemie* **2013**, 52, 6580-6589.

10. "Plasma, Tumor and Tissue Pharmacokinetics of Docetaxel Delivered via Nanoparticles of Different Sizes and Shapes in Mice Bearing SKOV-3 Human Ovarian Carcinoma Xenograft"; Chu, K.S.; Hasan, W.; Rawal, S.; Walsh, M. D.; Enlow, E. M.; Luft, J. C.; Bridges, A. S.; Kuijer, J. I.; Napier, M. E.; Zamboni, W. C.; DeSimone*, J. M. *Nanomedicine: Nanotechnology, Biology and Medicine* **2012**, 9(5), 686-693.

11. "Development of a Nanoparticle-based Influenza Vaccine Using the PRINT Technology"; Galloway, A. L.; Murphy, A.; DeSimone, J. M.; Di, J.; Hermann, J. P.; Hunter, M. E.; Kindig, J. P.; Malinoski, F. J.; Rumley, M. A.; Stoltz, D. A.; Templeman, T. S.; Hubby, B. *Nanomedicine: Nanotechnology, Biology, and Medicine* **2013**, *9*, 523-531.

12. DeSimone, J. M.; Wang, J.-Y.; Wang, Y. "Particle Replication in Non-wetting Templates: A Platform for Engineering Shape- and Size-Specific Janus Particles"; in *Janus Particle Synthesis, Self-Assembly and Applications*; Eds: Jiang, S. and Granick, S. 2012; pp. 90 – 107.

13. "Low Modulus Biomimetic Microgel Particles with High Loading of Hemoglobin"; Chen, K.; Merkel, T.; Pandya, A.; Napier, M.; Luft, C.; Daniel, W.; Sheiko, S.; DeSimone*, J. M. *Biomacromolecules* **2012**, *13(9)*, 2748-59.

14. "Microfabricated Engineered Particle Systems for Respiratory Drug Delivery and Other Pharmaceutical Applications"; Garcia, A.; Mack, P.; Wiliiams, S.; Fromen, C.; Shen, T.; Tully, J.; Pillai, J.; Kuehl, P.; Napier, M.; DeSimone, J. M.; Maynor, B. W. *J. Drug Delivery* **2012**, *2012*, 941243.

15. "PEGylated PRINT Nanoparticles: The Impact of PEG Density on Protein Binding, Macrophage Association, Biodistribution, and Pharmacokinetics"; Perry, J.; Reuter, K. G.; Kai, M. P.; Herlihy, K. P.; Jones, S. W.; Luft, C.; Napier, M.; Bear, J. E.; DeSimone, J. M.; *Nanoletters*, **2012**, *12(10)*, 5304-10.

16. "The Effect of Aspect Ratio and Deformability on Nanoparticle Extravasation through Nanopores"; Kersey, F.; Merkel, T.; Perry, J.; Napier, M.; DeSimone, J. M. *Langmuir* **2012***, 28(23),* 8773.

17. "Rendering Protein-based Particles Transiently Insoluble for Therapeutic Applications"; Xu, J.; Wang, J.; Luft, J.; Tian, S.; Owens, G.; Pandya, A.; Berglund, P.; Pohlhaus, P.; Maynor, B.; Napier, M.; DeSimone, J. M. *J. Am. Chem. Soc.* **2012**, *134(21)*, 8774.

18. "Incorporation and Controlled Release of Silyl Ether Pro-drugs from PRINT Nanoparticles"; Parrott, M.; Finniss, M.; Luft, J.; Pandya, A.; Gullapalli, A.; Napier, M.; DeSimone*, J. M. *J. Am. Chem. Soc.* **2012**, *134*, 7978-7982. **(# of citations = 1)**

19. "Reductively-responsive siRNA-conjugated Hydrogel Nanoparticles for Gene Silencing"; Dunn, S.; Tian, S.; Blake, S.; Wang, J.; Galloway, A.; Murphy, A.; Pohlhaus, P.; Rolland, J.; Napier, M.; DeSimone*, J. M. *J. Am. Chem. Soc.* **2012**, 134, 7423-7430. **(# of citations = 2)**

20. "*In vitro* and *in vivo* assessment of targeting lipid-based nanoparticles to the epidermal growth factor-receptor (EGFR) using a novel Heptameric Z(EGFR) domain"; Benhabbour, S. R.; Luft, J. C.; Kim, D.; Jain, A.; Wadhwa, S.; Parrott, M. C.; Liu, R.; DeSimone, J. M.; Mumper*, R. J. *J. Control Release* **2012**, *158(1)*, 63-71. **(# of citations = 3)**

21. "Engineering Nanomedicines Using Stimuli-responsive Biomaterials"; Wang, Y.; Byrne, J. D.; Napier, M. E.; DeSimone*, J. M. *Advanced Drug Delivery Reviews* **2012**, *64*, 1021-1030. **(# of citations = 0)**

22. "Delivery of Multiple siRNAs Using Lipid-coated PLGA Nanoparticles for treatment of Prostate Cancer"; Hasan, W.; Chu, K.; Gullapalli, A.; Dunn, S. S.; Enlow, E.; Luft, J. C.; Tian, S.; Napier, M.E.; Pohlhaus, P. D.; Rolland, J. P.; DeSimone*, J. M. *NanoLetters* **2012,** *12*, 287-292. **(# of citations = 3)**

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1. "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.

2. "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

3. "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

4. "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

5. "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

6. "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

7. "University Cancer Research Fund" Chapel Hill, NC, J.M. DeSimone (Co-PI), 2007-2011; $1,200,000

8. "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

9. "EAGER: Meso-Polymers" NSF Research, Chapel Hill, NC, J.M. DeSimone (PI), 5/1/2009-4/30/2011; DMR-0923604 ; 554766; $278,973

10. "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

11. "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

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14. "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

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10. **US Patent 5,514,759**; May 7, 1996; "Multi-phase Polymerization Process"; Inventors - J. M. DeSimone, T. J. Romack.

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30. **US Patent 5,860,467** January 19, 1999; "Use of CO_2-Soluble Materials in Making Molds"; Inventors - J. M. DeSimone, Esin Gulari, Charles Menke; Filed: December 3, 1996.

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Chen, Kai	Ph.D. Candidate	Tsinghua University
Chu, Kevin	Ph.D. Candidate, Pharmacy	University of Texas – Austin BME
Detter, Matthew	Undergraduate	UNC-CH
Finniss, Mathew	Research Assistant	UNC-CH (Chemistry)
Flannery, Tommy	Undergraduate	UNC-CH
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Kai, Marc	Ph.D. Candidate at NCSU	University of Louisiana
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Pandya, Ashish	Senior Research Associate	NC State University
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Short, Patrick	Undergraduate	UNC-CH
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Past Group Members and Visitors (* denotes people currently in academic positions)

71 Postdocs;
51 Ph.D. Degrees in Chemistry;
7 Ph.D. in Chemical Engineering;
12 M.S. Degrees in Chemistry;
22 B.S. Chemistry

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Askew, Kim	B.S. Chemistry	Medical School
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Behles, Jackie	Ph.D. Chemistry	Novartis
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Young, Jennifer	Ph.D. Chemistry	DuPont
Zannoni, Luke	Ph.D. Chemistry	Unilever
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