CHEMICAL HERITAGE FOUNDATION

JOSEPH M. DESIMONE

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Transcript of an Interview
Conducted by

David J. Caruso and Jody A. Roberts

at

University of North Carolina
Chapel Hill, North Carolina

on

1-2 May 2013

(With Subsequent Corrections and Additions)

CHEMICAL HERITAGE FOUNDATION
Center for Oral History
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Joseph M. DeSimone

(Date) 10/4/13

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Chemical Heritage Foundation
Center for Oral History
315 Chestnut Street
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JOSEPH M. DESIMONE

1964 Born in Norristown, Pennsylvania, on 16 May

Education

1986 B.S., Chemistry, Ursinus College
1990 Ph.D., Chemistry, Virginia Polytechnic Institute and State University

Professional Experience

University of North Carolina, Chapel Hill

1990-1994 Assistant Professor of Chemistry
1995 Mary Ann Smith Associate Professor of Chemistry
1996-1999 Mary Ann Smith Professor of Chemistry
1999-2008 William R. Kenan, Jr. Distinguished Professor of Chemistry
1999-2009 Director, NSF Science and Technology Center for Environmentally Responsible Solvents and Processes
2003-2012 Founding Director, Institute for Advanced Materials, Nanoscience and Technology
2005-present Faculty Member, Lineberger Comprehensive Cancer Center and Department of Pharmacology, School of Medicine
2005-present Co-PI, Carolina Center of Cancer Nanotechnology Excellence
2008-present Founding Director, Institute for Nanomedicine at UNC-CH
2008-present Chancellor's Eminent Professor of Chemistry at UNC
2012-2013 Director, Kenan Institute of Private Enterprise, Kenan Flagler Business School

North Carolina State University

1995-1996 Mary Ann Smith Associate Professor of Chemical Engineering
1996-1999 Mary Ann Smith Professor of Chemical Engineering
1999-2008 William R. Kenan, Jr. Distinguished Professor of Chemical Engineering

Memorial Sloan Kettering Cancer Center

2010-present Adjunct Member, Memorial Sloan Kettering Cancer Center and Sloan-Kettering Institute for Cancer Research

Honors

1992	National Science Foundation Young Investigator, Division of Materials Research
1993	Philip and Ruth Hettleman Prize for Artistic and Scholarly Achievement
1993	Presidential Faculty Fellow Award, National Science Foundation
1995	Finalist, Discovery Award for Technological Innovation
1995	Charles H. Stone Award
1995	Waldo Semon Award Lecturer, University of Akron
1997	Chancellor's Award for Excellence
1997	Governor's Award for Excellence
1997	Presidential Green Chemistry Challenge Award
1998	R&D Award with Micell Technologies
1998-2001	Alfred P. Sloan Research Fellowship
1999	Honorary Doctorate of Science from Ursinus College
1999	Carl S. Marvel Creative Polymer Chemistry Award
1999	Fresenius Award of the Phi Lambda Upsilon Honorary Chemical Society
2000	Oliver Max Gardner Award from the University of North Carolina
2001	Outstanding Young Alumnus Award from the Virginia Tech Alumni Association
2001	Esselen Award
2001	Governor's Entrepreneurial Company of the Year Award for Micell Technologies
2001	Inventor of the Year Award from the Triangle Intellectual Property Law Association
2001	Ernst & Young 2001 Entrepreneur of the Year in Technology (Carolinas)
2002	Wallace H. Carothers Award from the Delaware Section of the American Chemical Society
2002	Engineering Excellence Award by DuPont
2002	John Scott Award presented by the City Trusts, Philadelphia
2005	American Chemical Society Award for Creative Invention
2005	Entrepreneurial Excellence Award for Life Science Spin-out of the Year for Liquidia Technologies
2005	Member of the National Academy of Engineering
2005	Member of the American Academy of Arts and Sciences
2006	Fellow, American Association for the Advancement of Sciences (AAAS)
2006	H.F. Whalen, Jr. Award for Entrepreneurship by ACS Division of Business Development & Management
2006	Elected, College of Fellows, American Institute for Medical and Biological Engineering
2007	Collaboration Success Award from The Council for Chemical Research
2008	Inductee into the Order of the Golden Fleece
2008	Business Leader Magazine's 2007/2008 Impact Entrepreneur of the Year for the Triangle

2008	Named one of the "One Hundred Engineers of the Modern Era" by the American Institute of Chemical Engineers
2008	Tar Heel of the Year, Raleigh News & Observer
2008	Recipient of the $500,000 Lemelson-MIT Prize
2009	Alexander M. Cruickshank Award, Gordon Research Conferences
2009	Distinguished Graduate Alumni Achievement Award, Virginia Tech
2009	North Carolina Award
2009	NIH Director's Pioneer Award
2009	Tar Heel of the Year, Undergraduates at the school newspaper selection of the Person of the Year
2010	Founding POLY Fellow, Division of Polymer Chemistry, American Chemical Society
2010	AAAS Mentor Award
2011	PMSE Fellow, Division of Polymeric Material Science and Engineering, American Chemical Society
2011	Harrison Howe Award by the Rochester Section of the American Chemical Society
2011	Mendel Medal from Villanova University
2012	Chair, Gordon Research Conference on Drug Carriers in Medicine and Biology
2012	Fellow, American Chemical Society
2012	Walston Chubb Award for Innovation, presented by Sigma Xi, The Scientific Research Society
2012	Named a Paul Harris Fellow by the Rotary Foundation of Rotary International
2012	Member of the National Academy of Sciences
2013	National Academy of Inventors

ABSTRACT

Joseph DeSimone began his childhood in Norristown, Pennsylvania, one of three children. His father, an Italian immigrant, was a tailor; his mother was an accountant; there was a large Italian extended family. DeSimone attended St. Teresa of Avila Elementary School; when not in school he and friends were outside playing. Education was important in the family. The children attended the Catholic school until about junior high school, when the family moved to Collegeville, Pennsylvania. DeSimone was in gifted classes. High school brought discovery of programming and interest in solar architecture. He had typical science classes and labs, but in summer he was selected for a Lebanon Valley College project. He also attended Ursinus College for math classes, resulting in a scholarship to Ursinus.

At Ursinus, DeSimone felt academically challenged for the first time. He conceived a love for polymers and was recruited by Virginia Polytechnic Institute (Virginia Tech) for graduate school. After his PhD he intended to return to Philadelphia, but University of North Carolina persuaded him to join their faculty. There he began work with supercritical fluids. He published many papers, obtained grants from the National Science Foundation (NSF) and the Office of Naval Research, and was granted tenure early. He became the first Kenan Professor of Chemical Engineering at North Carolina State University, eventually establishing an NSF Science and Technology Center. His next interest was supercritical CO_2, with which he replaced water to manufacture surfactants. He won a Presidential Green Chemistry Award; founded dry cleaning soap company, Micell Technologies; and developed dry cleaning equipment. DeSimone found further use for supercritical CO_2, producing bioabsorbable stents with Richard Stack, and founding another company, whose stents are in clinical trials around the world. He met Stephen Quake and changed the direction of the STC from CO_2 to more microfluidics, inventing "liquid Teflon," then molds. He and his students invented PRINT (Particle Replication in Non-Wetting Templates), which allowed them to make uniform colloidal particles for the delivery of nucleic acids and medicines, and founded, Liquidia Technologies.

DeSimone established the Institute for Advanced Materials, Nanoscience, and Technology, increasing knowledge in medicine and energy. Because of PRINT's nanotechnology DeSimone was asked to establish the Carolina Center for Cancer Nanotechnology Excellence, using funding from the National Cancer Institute. He is affiliated with Memorial Sloan-Kettering Cancer Center. He has been elected to National Academy of Sciences and the National Academy of Engineering. He is now the Director of the Kenan Institute of Private Enterprise at UNC.

DeSimone concludes his interview with some general thoughts. He says his wife and son are his present mentors; he credits earlier mentoring and friendship from Chad Mirkin, Robert Langer, and Edward Samulski. He says he is currently working on grants and renewals.

TABLE OF CONTENTS

INDEX