

UNIVERSITY OF PENNSYLVANIA -- SCHOOL OF MEDICINE
Curriculum Vitae

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Donald L. Siegel, Ph.D., M.D.

Home Address: 2582 Brandon Court
Lansdale, PA 19446

Office Address: Division of Transfusion Medicine/3 Ravdin
Department of Pathology & Laboratory Medicine
HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA
3400 Spruce Street
Philadelphia, PA 19104-4283

Education: 1973-77 Sc.B. Brown University (Biophysics)
1977-83 Ph.D. Harvard University (Biophysics)
1983-87 M.D. University of Pennsylvania

Postgraduate Training and Fellowship Appointments:

1987-89 Resident in Clinical Pathology, HUP, Philadelphia, PA
1989-90 Chief Resident, Division of Laboratory Medicine, HUP,
Philadelphia, PA
1990-91 Fellowship, Transfusion Medicine, HUP, Philadelphia, PA
2007-08 Academic Medical Leadership Program, The Wharton School
of the University of Pennsylvania, Philadelphia, PA
2008-09 Penn Medicine Leadership Forum, The Wharton School of the
University of Pennsylvania, Philadelphia, PA

Faculty Appointments: 1987-89 Assistant Instructor, Dept. of Pathology & Lab.
Med., Univ. of PA School of Medicine, Philadelphia, PA
1989-91 Instructor, Dept. of Pathology & Lab.
Med., Univ. of PA School of Medicine, Philadelphia, PA
1991-92 Lecturer, Dept. of Pathology & Lab. Med.,
Univ. of PA School of Medicine, Philadelphia, PA
1992-00 Assistant Professor of Pathology & Lab. Med.,
Univ. of PA School of Medicine, Philadelphia, PA
2000-06 Associate Professor of Pathology & Lab. Med.,
Univ. of PA School of Medicine, Philadelphia, PA
2006- Professor of Pathology & Lab. Med.,
Univ. of PA School of Medicine, Philadelphia, PA

Hospital and Administrative Appointments:

1990-96 Hospital Transfusion Committee, Member, HUP

1991-	Attending Physician, Blood Bank/Transfusion Medicine Section, Department of Pathology & Lab. Medicine, HUP
1992-96	Vice-Chairman, Hospital Transfusion Committee, HUP
1997-	Attending Physician, Department of Pathology & Lab Medicine, Presbyterian Hospital
2000-	Medical Director, AABB-accredited Blood Bank and Apheresis/Infusion Unit, Hospital of the University of Pennsylvania
2000-2003	Director, Blood Bank/Transfusion Medicine Section, Department of Pathology & Lab. Medicine, University of Pennsylvania Medical Center
2000-present	Director, ACGME-accredited Fellowship Program in Blood Banking/Transfusion Medicine
2000-present	Member for Oversight of Blood Usage, Clinical Effectiveness and Quality Improvement Committee
2002--present	Member, Executive Committee, Department of Pathology & Lab Medicine
2002-present	Medical Director, FACT-accredited cell collection and processing facilities for Hematopoietic Stem Cell Transplant Program
2003-present	Founding Director, Division of Transfusion Medicine & Therapeutic Pathology
2004-present	Member, Cell and Vaccine Production Facility Advisory Committee
2006-07	Member, General Clinical Research Center Advisory Committee
2008-present	Medical Director, FACT-accredited Cell and Vaccine Production Facility
2009-2017	Medical Director, Penn Medicine Blood Donation Center
2014-2017	Medical Director for Cellular Therapies, Penn Medicine
2017-present	Director, Clinical Cell & Vaccine Production Facility, Center for Advanced Cellular Therapeutics

Specialty Certification:

1992	The American Board of Pathology
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Licensure:

	Pennsylvania
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Awards, Honors, and Membership in Honorary Societies:

1977	elected to Sigma Xi
1977	Honors in Biophysics, Brown University, undergraduate thesis: "Application of non-equilibrium thermodynamics to plasma membrane transport"
1977-83	NIH Pre-Doctoral Fellowship in the laboratory of Dr. Daniel Branton, Harvard University, Ph.D. dissertation: "Purification and characterization of human erythrocyte band 4.9, an actin bundling protein"

1983	Young Investigator Award, First Prize Recipient, Boston Blood Club, Harvard Medical School
1983-85	Measey Foundation Scholar, University of Pennsylvania School of Medicine
1988	2 Young Investigator Awards, Academy of Clinical Laboratory Physicians and Scientists, 1988 Annual Meeting
1990	Berwick Resident Teaching Award, Department of Pathology & Laboratory Medicine, University of Pennsylvania
1991-92	Julius Erving Research Award of the Lupus Foundation of the Delaware Valley
1991-92	American Association of Blood Banks Research Award
1991-94	Clinical Investigator Award (K08), National Heart, Lung, and Blood Institute, NIH
1993-95	Basil O'Connor Scholar Research Award, March of Dimes Birth Defects Foundation
1996-97	National Blood Foundation Research Award
1996	National Blood Foundation Scholar
1998	Peter C. Nowell Teaching Award, Department of Pathology & Laboratory Medicine, University of Pennsylvania
2000	Leonard Berwick Memorial Teaching Award, University of Pennsylvania School of Medicine
2001	elected to John Morgan Society
2003	Philadelphia Antiques Show Proceeds Awardee, Board of Women's Visitors, University of Pennsylvania Medical Center
2003	Pennsylvania Biotechnology Greenhouse Award
2003	Christian R. and Mary F. Lindback Foundation Award for Distinguished Teaching, University of Pennsylvania
2010	Patient Health Care Hero awardee, Penn Medicine
2013	elected Fellow, College of American Pathologists
2013	elected to The Academy of Master Clinicians, Penn Medicine
2015	Patient Health Care Hero awardee, Penn Medicine
2016	UPenn Health System Quality & Patient Safety Award, "Blood Delivery and Wastage in the PeriOperative Setting"
2017	RISE (Research Innovation in Scientific Excellence) Award from AABB for best original research article published in <i>Transfusion</i> in 2016
2018	Francis S. Morrison, MD Memorial Lectureship, 2018 Meeting of the American Society for Apheresis
2018	Gift of Life Award, Ree Wynn Foundation

Memberships in Professional and Scientific Societies:

Regional Committees:

- Member, Medical Advisory Committee, Penn-Jersey Division of the American Red Cross (Member, 2000-present)
- Member, Executive Committee of the Medical Advisory Board, Penn-Jersey Division of the American Red Cross (2008-present)

Regional Scientific Committees:

Chair, Scientific Advisory Board, PhenoTech, Inc. (UPenn biotech start-up, 2003-2009)

National/International Societies:

American Association for Cell Biology (Member, 1981-present)
American Association for the Advancement of Science (Member, 1987-present)
American Association of Blood Banks (Member, 1989-present)
American Society of Hematology (Member, 1987-present)
American Society for Apheresis (Member, 2001-present)
John Morgan Society (Member, 2001-present)
International Society for Cellular Therapy (Member, 2017-present)

National Scientific Committees:

Scientific Review Panel, Program Project on Prion Diseases, National Institute on Aging (Member, 1998)
NIH/AABB-Sponsored Scientific Think Tank on “Setting the Research Agenda for Immunobiology in Transfusion Medicine”(Member, 1999)
Scientific Subsection Committee, American Association of Blood Banks (Member, 1999-present)
Scientific Subcommittee on Hemoglobin/Red Cell, American Society of Hematology (Member, 1999-2003)
Clinical Applications and Standards Committee, American Society for Apheresis (Member, 2004-present)
NIH Hematology Small Business Activities (SBIR/STTR) Special Emphasis Panel Reviewer (2006)
NIH NHLBI Strategic Planning Meeting “Research in Global Blood Safety and Availability, Domestic and International (Member, 2006)
FDA Workshop on Molecular Methods in Transfusion Medicine (Member, 2006)
Selected Topics in Transfusion Medicine Study Section (ZRG1 VH-E 50R, Member, 2010-)
Board of Scientific Counselors, Site Visit, Department of Transfusion Medicine, NIH (Member, 2017)

International Scientific Committees:

4th International Workshop on Monoclonal Antibodies Against Human Red Blood Cells and Related Antigens, Paris (Coordinator, 1999-2001)
Expert Review Panel for Evaluation of the Operational Research Program, Hema-Quebec, Quebec City, Canada (Member, 2004 and 2006)

Academic Committees at the University of Pennsylvania and Affiliated Hospitals:

1992-1996 Medical Student Advisor, School of Medicine

- 1992-1998 Faculty Interviewer, Committee on Admissions, School of Medicine
- 1994-present Faculty Advisory Committee, Transfusion Medicine Research Training Program (NIH T32 Award; member, 1994-1999, chair, 2000-present)
- 1997-present Member, Immunology Graduate Group
- 1997-present House Mentor, Combined Degree Mentoring Program, School of Medicine
- 1998-present Member, Center for AIDS Research
- 2000-present Member, Faculty Advisory Committee, Hemostasis/Thrombosis Research Training Program (NIH T32 Award)
- 2000-present Member, Curriculum Committee for "Frontiers in Medical Science"
- 2006-present Member, Institute for Translational Medicine and Therapeutics
- 2008-2013 Member, Limited Application Selection Committee, School of Medicine
- 2008-present Member, University of Pennsylvania Conflict of Interest Standing Committee
- 2012-present Founding Member, Executive Committee, The Penn-CHOP Blood Center for Patient Care & Discovery
- 2013-present Member, Clinical Excellence Advisory Committee, Penn Medicine

Major Teaching and Clinical Responsibilities for the University of Pennsylvania and Affiliated Hospitals:

- 1991-present Daily attending rounds, Blood Bank/Transfusion Medicine Section (until 2003); Division of Transfusion Medicine (2004-present); HUP; 3 months/year
- 1991-present In-service seminars on Transfusion Medicine topics to clinical services, HUP; throughout year
- 1991-present Morning report attending, Clinical Pathology Residents, HUP; 2 months/year
- 1991-present Seminars on Transfusion Medicine to rotating fellows, residents, medical students, HUP; throughout year
- 1992-1998 Pathology 200, lecturer (2 one-hour lectures on Transfusion Med.) and medical student section leader for Heme/Onc Bridge (4 two-hour meetings), School of Medicine (course now replaced by Curriculum 2000)
- 1992-1999 Immunology (ID101), lecturer (2 one-hour lectures on Immunohematology) and medical student section leader (5 hours/week x 4 weeks), School of Medicine (course now replaced by Curriculum 2000)
- 1992-present Course Director for Frontiers of Medical Science Course FRO505 (formerly Pathology 305), "Effective Use of

- Clinical Laboratory Tests", School of Medicine, course offered once per year for 2 weeks
- 1992-present Supervision of post-doctoral fellows and students in laboratory
- 1997-present Immunology 599, research seminar to Immunology Group graduate students, once/year
- 1998-present MDTI (Curriculum 2000), lecturer (2 one-hour lectures on Transfusion Medicine); medical student section leader for Transfusion Medicine laboratory (one three-hour session), School of Medicine
- 2000-present Course Director for Pathology elective, "Immunohematology" (Pathology 323), School of Medicine, offered each month
- 2000-present Didactics on Transfusion Medicine to Hematology/Oncology Fellows, HUP, twice per year
- 2000-present Director, Transfusion Medicine Journal Club (CME-accredited beginning in 2005)
- 2006-2010 Immunology course for Cell and Molecular Biology graduate group students, lecture on "Antibody-Based Techniques", once per year.
- 2006-present Blood Bank/Transfusion Medicine Overview for HUP anesthesiology residents
- 2006-present Lecture on "Phage Display Technology for Diagnostic and Therapeutic Reagents" in Masters in Translational Research course "Disease Measurement" (MTR603)
- 2006-present Medical Student Preceptor for "Longitudinal Experience to Appreciate Patient Perspectives (LEAPP) Course"
- 2007-present Faculty Preceptor for "Case Studies in Translational Medicine BIOM 510"
- 2007-2013 Faculty Preceptor for UPenn Medical Student Team Building initiative
- 2008-present Blood Bank Rotation Director for UPHS Anesthesiology and Critical Care residents
- 2010-2012 Lecture on "Changing Cells to Make Them Resistant to HIV" in Masters in Translational Research course "Translational Therapeutics" (MTR608)
- 2011-present Apheresis Rotation Director for HUP Renal Fellows
- 2011 Lecture on "*In vivo* and *in vitro* Generation of Antibodies" in Immunology course "Immune Responses" (IMUN508)
- 2011-2013 Faculty preceptor Roy and Diana Vagelos Program in Life Sciences and Management Program Capstone Course (LSMP 421)
- 2012-present "Technology Transfer, Intellectual Property, and Patents", Pathology Resident Management Lecture Series, HUP, biannually
- 2012-present Didactics on Transfusion Medicine to Gyn/Onc Fellows, HUP, annually
- 2014-present Lecture "Cellular Therapies and Transfusion Delivery" in "Drug Delivery Systems: Targeted Therapeutics and Translational Nanomedicine" (CBE 564/PHARM 564)

- 2014-present Lecture “Phage Display and Other High Throughput Systems” in “Drug Delivery Systems: Targeted Therapeutics and Translational Nanomedicine” (CBE 564/PHARM 564)
- 2014-present Lecture “Translation: IP and Commercialization” in “Drug Delivery Systems: Targeted Therapeutics and Translational Nanomedicine” (CBE 564/PHARM 564)
- 2015-present Lecture “Apheresis for Heme/Onc Fellows”
- 2016-present Lecture “cGMP Manufacturing Facility Design and Infrastructure Considerations” in “Cell and Gene Therapy” (MTR/REG 621)
- 2016-present Lecture “Identification of Cell-Surface Antigens” in “Molecular Imaging” (BE483/583)
- 2017-present Lecture “Overview of Transfusion Medicine and the Appropriate Use of Blood Products”, Anesthesia/Critical Care Housestaff, Surgical Intensive Care Unit, HUP
- 2018-present

Other Teaching:

- 1996-present Co-Director, “Phage Display of Proteins and Peptides”, Cold Spring Harbor Laboratory Course, Cold Spring Harbor, NY, two-week course given annually
- 2001 “Practical and technical issues regarding phage display technology,” 4th International Workshop on Monoclonal Antibodies Against Human Red Blood Cells and Related Antigens, Paris, France
- 2009 “Workshop on construction and panning of antibody phage display libraries,” 11th Annual Phage Display of Antibodies and Peptides, PEGS Protein Engineering Summit, Boston, MA.

Lectures by Invitation:

- February, 1981 *The Red Cell Cytoskeleton*. Workshop at ICN Meeting, Differentiation and Function of Hematopoietic Cell Surfaces, Keystone, CO.
- June, 1981 *Cytoskeletal Structures*. Cold Spring Harbor Symposium, Organization of the Cytoplasm, Cold Spring Harbor, NY.
- November, 1982 *Human Erythrocyte Band 4.9*. 22nd Annual Meeting, American Society for Cell Biology, Baltimore, MD.
- December, 1982 *Human Erythrocyte Band 4.9*. Department of Hematology, St. Elizabeth's Hospital, Boston, MA.
- January, 1983 *Human Erythrocyte Band 4.9*. Department of Cell and Developmental Biology, Harvard University, Boston, MA.
- April, 1983 *Human Erythrocyte Band 4.9*. Boston Blood Club, Harvard Medical School, Boston, MA.

- June, 1983 *Band 4.9, an Actin-Bundling Protein.* Department of Hematology/Oncology, Children's Hospital, Boston MA.
- June, 1983 *Band 4.9, an Actin-Bundling Protein.* Department of Biochemistry and Molecular Biology, Harvard University, Boston, MA.
- August, 1983 *Band 4.9, an Actin-Bundling Protein.* Red Cell Gordon Conference, Portsmouth, NH.
- December, 1983 *Band 4.9, an Actin-Bundling Protein.* 23rd Annual Meeting, American Society for Cell Biology, San Antonio, TX.
- January, 1984 *Human Erythrocyte Cytoskeletal Organization -- Normal and Pathologic States.* Hematology Department, Children's Hospital of Philadelphia, Philadelphia, PA.
- February, 1984 *The Human Erythrocyte Cytoskeleton.* Cell Motility Club, Department of Anatomy, University of Pennsylvania, School of Medicine, Philadelphia, PA.
- May, 1985 *The Relationship Between the Structure and Function of the Human Erythrocyte Membrane.* Department of Pathology and Laboratory Medicine, University of Pennsylvania, School of Medicine, Philadelphia, PA.
- November, 1987 *Differential Expression of Activation Antigens on Peripheral Blood Lymphocytes in Renal Allograft Recipients During Episodes of Rejection and Infection.* 8th Annual Philadelphia Regional Immunology Conference, Philadelphia, PA.
- June, 1988 *Differential Expression of Activation Antigens on Peripheral Blood Lymphocytes in Renal Allograft Recipients During Episodes of Rejection and Infection.* 7th Annual Meeting, American Society of Transplant Physicians, Chicago, IL.
- June, 1988 *Distinguishing Rejection from Viral Infection in Renal Allograft Recipients Using Flow Cytometry.* Annual Meeting, Academy of Clinical Laboratory Physicians and Scientists, Cincinnati, OH.
- June, 1988 *Monitoring Patients with Pancreas Allografts.* Annual Meeting, Academy of Clinical Laboratory Physicians and Scientists, Cincinnati, Ohio.
- February, 1991 *Molecular Dissection of Human Red Cell Membrane Antigens.* Department of Pathology, SUNY Stony Brook School of Medicine, Stony Brook, New York.
- April, 1991 *Molecular Dissection of Human Red Cell Membrane Antigens.* Department of Pathology, University of Chicago, Chicago, Ill.
- April, 1991 *Molecular Dissection of Human Red Cell Membrane Antigens.* Department of Laboratory Medicine, Yale School of Medicine, New Haven, Conn.
- May, 1991 *Molecular Dissection of Human Red Cell Membrane Antigens.* Lindsley F. Kimball Research Institute of the New York Blood Center, New York, NY.

- November, 1992 *Production of Human Red Cell Antibodies in Bacteria by Repertoire Cloning. Plenary Session*, 45th Annual Meeting of the American Association of Blood Banks, San Francisco, CA.
- April, 1993 *In Vitro Production of Anti-Red Cell Antibodies*. Pennsylvania Society for Medical Technologists, Annual Meeting, Valley Forge, PA
- October, 1993 *Expression and Characterization of Recombinant Anti-Rh(D) Antibodies on Filamentous Phage: A Model System for Isolating Human Red Cell Antibodies by Repertoire Cloning*. The Center for Blood Research, Boston, MA.
- October, 1993 *Isolation of Recombinant Human Anti-Rh(D) Antibodies From Libraries Expressed on M13 Phage*. 46th Annual Meeting of the American Association of Blood Banks, Miami, FL.
- November, 1993 *Blood Component Therapy*. CME seminar, Doylestown Hospital, Doylestown, PA.
- July, 1994 *Isolation of Human Anti-Red Blood Cell Antibodies by Repertoire Cloning*. International Conference on Immunoglobulin Gene Expression in Development and Disease, The New York Academy of Sciences, Montreal, Quebec, Canada.
- January, 1995 *Production of Recombinant Anti-Red Blood Cell Antibodies on Filamentous Bacteriophage*. Visiting Professor, University of Tennessee, Memphis, Tennessee.
- September, 1996 *Molecular Characterization of the Human Anti-Rh Immune Response Using Fab-Phage Display*. Grand Rounds, Department of Pathology & Laboratory Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA
- October, 1996 *A Plethora of Human Monoclonal Anti-Rh Antibodies Isolated Using Phage Display and Magnetically-Activated Cell Sorting, Plenary Session*, 49th Annual Meeting of the American Association of Blood Banks, Orlando, FL.
- October, 1996 *Molecular Characterization of the Human Anti-Rh Immune Response Using Fab-Phage Display*. Ortho Diagnostics Systems, Inc., Raritan, NJ.
- November, 1996 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. Wistar Institute, Philadelphia, PA.
- November, 1996 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 1996 Cold Spring Harbor Laboratory Course on Monoclonal Antibodies from Combinatorial Libraries, Cold Spring Harbor, NY.

- November, 1996 *Molecular Characterization of the Human Anti-Rh Immune Response Using Fab-Phage Display.* Lindsley F. Kimball Research Institute of the New York Blood Center, New York, NY.
- December, 1996 *Highly-Efficient Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* Seventh IBC Conference on Antibody Engineering, San Diego, CA.
- December, 1996 *Efficient Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display: Applications in Transfusion Medicine.* Immunology Group, Smith Kline Beecham, Inc., King of Prussia, PA.
- January, 1997 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display: Applications in Transfusion Medicine.* Scripps' Research Institute, La Jolla, CA.
- January, 1997 *Molecular Characterization of the Human anti-Rh Immune Response Using Fab/Phage Display.* Immunology Colloquium, Immunology Graduate Group, University of Pennsylvania.
- May, 1997 *Monoclonal Bacteriophage Antibodies.* 1997 Illinois Association of Blood Banks Quad State blood bank meeting, Chicago, IL.
- May, 1997 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display: Applications in Immunohematology.* Department of Immunology and Microbiology, Allegheny University of the Health Sciences, Philadelphia, PA.
- September, 1997 *Recombinant Phage-Displayed Human Anti-Red Blood Cell Antibodies and Blood Banking: A New Way to Type Blood.* Delaware Valley Blood Bank Club, Penn-Jersey Red Cross, Philadelphia, PA.
- September, 1997 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display: Applications in Transfusion Medicine.* Pathology Department Grand Rounds, New York Hospital/Cornell Medical Center, New York, NY.
- October, 1997 *New Approaches to Monoclonal Antibody Production.* Annual Seminar, 50th Annual Meeting of the American Association of Blood Banks, Denver, CO.
- November, 1997 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 1997 Cold Spring Harbor Laboratory Course on Phage Display of Combinatorial Antibody Libraries, Cold Spring Harbor, NY
- December, 1997 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display: Applications in Immunohematology.* Prolifaron, Inc., La Jolla, CA.
- December, 1997 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display: Applications in Immunohematology.* Gamma Biologicals, Inc., Houston, TX.

- February, 1998 *A New Approach for Human Monoclonal Antibody Production in Transfusion Medicine: Bacteriophage-Displayed Antibodies as Reagents for Blood Typing and Dissecting Rh Antigen Epitope Topology.* Department of Pathology, UCLA School of Medicine, Los Angeles, CA.
- April, 1998 *Bacteriophage-Displayed Antibodies as Novel Reagents for Blood Typing and Understanding the Development of Human Immune Responses.* Laboratory Medicine Divisional Conference, Department of Pathology & Laboratory Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA.
- April, 1998 *Molecular Characterization of the Human Anti-Rh Immune Response Using Fab/Phage Display.* Immunology Seminar Series, Mt. Sinai School of Medicine, New York, NY.
- April, 1998 *New Insights into the Immunobiology of the Rh Antigen as Revealed by Phage Display Technology.* NHLBI, NIH, Bethesda, MD.
- May, 1998 *A New Approach for Human Monoclonal Antibody Production: Bacteriophage-Displayed Antibodies as Reagents for Blood Typing and Dissecting Rh Antigen Epitope Topology.* 1998 Reference Laboratory Conference, American Red Cross, Washington, D.C.
- June, 1998 *Molecular Characterization of the Human Anti-Rh Immune Response Using Fab/Phage Display.* Dyax Corporation, Cambridge, MA.
- June, 1998 *The Dwindling Supply of Human Antisera for Blood Group Typing: A Solution Using Phage Display Technology.* Annual Meeting of the Academy of Clinical Laboratory Physicians and Scientists, Boston, MA.
- August, 1998 *Molecular Characterization of the Human Red Cell anti-Rh Immune Response Using Fab/phage Display.* Abgenix, Inc., Fremont, CA.
- October, 1998 *New Insights into the Immunobiology of the Human Rh Antigen as Revealed by Phage Display Technology.* Department of Pathology, Beth Israel Hospital, Harvard Medical School, Boston, MA.
- November, 1998 *Epitope Migration of Anti-D Antibodies.* 51st Annual Meeting of the American Association of Blood Banks, Philadelphia, PA.
- November, 1998 *Isolation of Human IgG Platelet Autoantibodies Using Phage Display.* Plenary Session, 51st Annual Meeting of the American Association of Blood Banks, Philadelphia, PA.
- November, 1998 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 1998 Cold Spring Harbor Laboratory Course on Phage Display of Combinatorial Antibody Libraries, Cold Spring Harbor, NY.

- December, 1998 *Epitope Migration: Anti-Rh(D) Antibodies as a Model for Human Immunogenicity.* 40th Annual Meeting of the American Society for Hematology, Miami, FL.
- January, 1999 *New Insights Into Human Monoclonal Anti-Rh and Anti-Platelet Antibodies as Revealed by Phage Display.* Hematology-Oncology Section Research Conference, Department of Medicine, University of Pennsylvania Medical Center.
- January, 1999 *Characterization of Human Monoclonal Anti-RBC and Anti-Platelet Antibodies Using Phage Display.* Hematology Grand Rounds, Mt. Sinai School of Medicine, New York, NY.
- February, 1999 *New Insights Into Human Monoclonal Anti-Rh and Anti-Platelet Antibodies as Revealed by Phage Display.* Laboratory Medicine Divisional Conference, Department of Pathology & Laboratory Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA.
- March, 1999 *Use of Phage Display Technology for the Development of Blood Group Typing Reagents.* Cambridge Healthtech Institute's Phage Display -- Novel Therapeutics and Diagnostics: Applications in Product Development, Cambridge, MA.
- April, 1999 *Dissecting Human Auto- and Alloimmune Responses to RBCs and Platelets Using Phage Display Technology.* Lindsley F. Kimball Research Institute of the New York Blood Center, New York, NY.
- May, 1999 *Phage Display Technology and its Applications in the Field of Immunohematology and ITP.* 1999 International Society of Blood Transfusion, Jerusalem, Israel.
- June, 1999 *Recombinant Approaches for Developing Diagnostic Reagents in Transfusion Medicine.* Annual Meeting of the Academy of Clinical Laboratory Physicians and Scientists, Birmingham, AL.
- September, 1999 *Use of Repertoire Cloning and Antibody Engineering in the Design of Therapeutics* NIH/AABB-Sponsored Scientific Think Tank on "Setting the Research Agenda for Immunobiology in Transfusion Medicine," Bethesda, MD.
- October, 1999 *Application of Molecular Biology to Immunoglobulin Engineering.* Molecular Biology in Blood Transfusion, 24th International Symposium, The Netherlands.
- November, 1999 *Dissecting Human Auto- and Alloimmune Responses to RBCs and Platelets Using Phage Display Technology.* The Second Leonard Jarett MD Honorary Research Symposium, University of Pennsylvania School of Medicine.
- November, 1999 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 1999 Cold Spring Harbor Laboratory Course on Phage Display of Combinatorial Antibody Libraries, Cold Spring Harbor, NY.

- November, 1999 *Production of Large Repertoires of Macaque mAbs to Human RBCs Using Phage Display.* 52nd Annual Meeting of the American Association of Blood Banks, San Francisco, CA.
- November, 1999 *Understanding Immunogenicity on a Molecular Level: New Insights Revealed by the Rh(D) Immune Response.* 52nd Annual Meeting of the American Association of Blood Banks, San Francisco, CA.
- November, 1999 *Mechanism of Rh immune globulin prophylaxis revisited.* 52nd Annual Meeting of the American Association of Blood Banks, San Francisco, CA.
- May, 2000 *Appropriate Use of Blood Products.* CME seminar, Phoenixville Hospital, Phoenixville, PA.
- June, 2000 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display.* NCI-sponsored workshop, Molecular Diversity-Based Discovery of Tumor-Specific Diagnostic Markers and Probes, Bethesda, MD.
- September, 2000 *Phage Display and anti-Rh(D) Repertoire.* Sixth Symposium on Platelet, Granulocyte and Red Cell Immunobiology, Amsterdam, Netherlands.
- October, 2000 *Epitope Migration of Anti-Rh(D) Antibodies and the Concept of Red Cell Antigen Immunogenicity.* Blood Research Institute, Milwaukee, Wisconsin.
- November, 2000 *What's a Clinically Significant Antibody?* 53rd Annual Meeting of the American Association of Blood Banks, Washington, D.C.
- November, 2000 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 2000 Cold Spring Harbor Laboratory Course on Phage Display of Combinatorial Antibody Libraries, Cold Spring Harbor, NY.
- May, 2001 *Staph Protein A Columns.* 22nd Annual Meeting of the American Society for Apheresis, Niagara Falls, NY.
- July, 2001 *Recombinant Monoclonal Antibody Technology.* 4th International Workshop on Monoclonal Antibodies Against Human Red Blood Cells and Related Antigens, Paris, France. (*Plenary Lecture*)
- July, 2001 *Structural Analysis of Monoclonal Antibodies to Blood Group Antigens.* Coordinator's Report, 4th International Workshop on Monoclonal Antibodies Against Human Red Blood Cells and Related Antigens, Paris, France.
- October, 2001 *Dissecting Human Auto- and Alloimmune Responses to RBCs and Platelets Using Phage Display Technology.* Microbiology and Immunology Seminar Series, MCP Hahnemann Univ. School of Medicine, Philadelphia, PA.

- October, 2001 *What's a Clinically Significant Antibody?* 54th Annual Meeting of the American Association of Blood Banks, San Antonio, TX.
- October, 2001 *Antibody Phage Display: Implications for Reagent Production and Treatment of Antibody-Mediated Disease.* Workshop on Application of Molecular Biology to Immunohematology, 54th Annual Meeting of the American Association of Blood Banks, San Antonio, TX.
- November, 2001 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 2001 Cold Spring Harbor Laboratory Course on Phage Display of Combinatorial Antibody Libraries, Cold Spring Harbor, NY.
- December, 2001 *Understanding Immunogenicity on a Molecular Level: New Insights Revealed by the Rh Immune Response.* Scientific Committee on Transfusion Medicine: The Immune Response to Transfusion, 43rd Annual Meeting of the American Society for Hematology, Orlando, FL.
- April, 2002 *Thrombotic Thrombocytopenic Purpura (TTP): Exciting recent findings which have advanced our understanding of disease pathogenesis and treatment by plasmapheresis.* Pennsylvania Society for Clinical Laboratory Science Annual Meeting, King of Prussia, PA.
- April, 2002 *Dissecting Human Auto- and Alloimmune Responses to RBCs and Platelets Using Phage Display Technology: Diagnostic and Therapeutic Implications.* Department of Biologics Research, Merck Research Laboratories, Rahway, NJ.
- May, 2002 *Dissecting Human Auto- and Alloimmune Responses to RBCs and Platelets Using Phage Display Technology.* Transfusion Medicine Grand Rounds, Joint Harvard Program in Transfusion Medicine, Harvard Medical School, Boston, MA.
- May, 2002 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies to Red Cells and Platelets Using Phage Display and Magnetically-Activated Cell Sorting.* New England Biolabs, Beverly, MA.
- September, 2002 *Developing New Diagnostic and Therapeutic Tools for Immune-Mediated Diseases Using Antibody Engineering.* Duhring Lecture, Division of Dermatology, University of Pennsylvania School of Medicine, Philadelphia, PA.
- September, 2002 *The Use of Phage Display to Develop Rational Therapies for the Treatment of Autoimmune Platelet Disorders (ITP).* Conference on Display Technologies Accelerating Drug Discovery, Strategic Research Institute, Long Branch, NJ.
- October, 2002 *Genetic Analyses of Human Immune Responses to Red Cells and Platelets.* Rheumatology Division Grand Rounds, UCSD, San Diego, CA.
- October, 2002 *Autoimmune Thrombocytopenic Purpura (ITP): Current Treatment Options and Those on the Horizon.* Department of Medicine Grand Rounds, UCSD, San Diego, CA.

- October, 2002 *Antibody Phage Display: Implications for Reagent Production and Treatment of Antibody-Mediated Disease.* Workshop on Application of Molecular Biology to Immunohematology, 55th Annual Meeting of the American Association of Blood Banks, Orlando, FL.
- November, 2002 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 2002 Cold Spring Harbor Laboratory Course on Phage Display of Combinatorial Antibody Libraries, Cold Spring Harbor, NY.
- December, 2002 *Cloning of Anti-Platelet Autoantibodies.* ITP Workshop, 44th Annual Meeting of the American Society for Hematology, Philadelphia, PA.
- March, 2003 *Phage Display Technology.* BioRexis, Inc., King of Prussia, PA.
- April, 2003 *Use of Phage Display Technology for Developing Diagnostic and Therapeutic Reagents.* Laboratory Medicine Residents' Noon Seminar, Department of Pathology & Laboratory Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA.
- May, 2003 *Creating Diagnostic and Therapeutic Molecules Using Phage Display.* Hematology/Oncology Research Seminar Series, Children's Hospital of Philadelphia, Philadelphia, PA.
- June, 2003 *Antibody Phage Display for Reagent and Therapeutic Antibody Production.* Current Topics in Blood Banking Conference, University of Michigan, Ann Arbor, MI.
- June, 2003 *Etiology and Management of ITP.* Current Topics in Blood Banking Conference, University of Michigan, Ann Arbor, MI.
- June, 2003 *Antibody Phage Display for Reagent and Therapeutic Antibody Production.* Targeted Molecules, Inc., San Diego, CA
- September, 2003 *Blood Transfusion Risks.* Department of Urology Grand Rounds, University of Pennsylvania Medical Center, Philadelphia, PA.
- September, 2003 *Developing New Diagnostic and Therapeutic Tools for Immune-Mediated Diseases Using Antibody Engineering.* Renal Research Conference, University of Pennsylvania School of Medicine, Philadelphia, PA.
- October, 2003 *Phage Display Technology for the Development of Novel Diagnostic and Therapeutic Agents.* 12th Annual Meeting of the Great Lakes International Imaging and Flow Cytometry Association, Milwaukee, WI.
- November, 2003 *Diagnostic and Therapeutic Applications of Phage Display Technology.* Session on Emerging Technologies and Therapies in Transfusion Medicine, 56th Annual Meeting of the American Association of Blood Banks, San Diego, CA.

- November, 2003 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 2003 Cold Spring Harbor Laboratory Course on Phage Display of Combinatorial Antibody Libraries, Cold Spring Harbor, NY.
- December, 2003 *Characterization of an ITP Patient-Derived Anti- $\alpha_{IIb}\beta_3$ Monoclonal Antibody that Inhibits Platelet Aggregation*. 45th Annual Meeting of the American Society for Hematology, San Diego, CA.
- April, 2004 *Transfusion Medicine Overview*. Weekly Conference, Division of Vascular Surgery, Department of Surgery, University of Pennsylvania Medical Center.
- April, 2004 *Clinical, Educational, and Research Activities of Division of Transfusion Medicine*. Department of Pathology & Laboratory Medicine Academic Retreat, College of American Physicians, Philadelphia, PA.
- May, 2004 *Therapeutic Apheresis/Extra-Corporeal Selective Extraction Techniques*. World Apheresis Association/American Association of Apheresis Joint Meeting, Miami, FL.
- October, 2004 *Phage Display Tools for Automated Blood Typing*. Plenary Session, 57th Annual Meeting of the American Association of Blood Banks, Baltimore, MD.
- October, 2004 *Diagnostic and Therapeutic Applications of Phage Display Technology*. Session on Emerging Technologies and Therapies in Transfusion Medicine, 57th Annual Meeting of the American Association of Blood Banks, Baltimore, MD.
- November, 2004 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 2004 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.
- December, 2004 *Review of Different Kinds of Blood Components and the Indications and Risks of Their Use*. Grand Rounds CME Program, The Chester County Hospital, West Chester, PA.
- January, 2005 *ITP and the Mechanism of Action of Staphylococcal Protein A Plasmapheresis*. Allergy & Immunology Divisional Conference, University of Pennsylvania School of Medicine, Philadelphia, PA.
- May, 2005 *Diagnostic and Therapeutic Applications of Phage Display Technology*. The 8th Leonard Jarett MD Honorary Research Symposium, University of Pennsylvania School of Medicine.
- June, 2005 *Transfusion Medicine Overview*. Weekly Teaching Conference, Division of Maternal-Fetal Medicine, HUP.

- June, 2005 *Use of Phage Display to Study Human Autoimmune Disease: ITP as a Paradigm.* “Pemphigus 2005, Progress and Future Directions”, an international meeting sponsored jointly by the International Pemphigus Foundation, The American Autoimmune Related Diseases Association, and the NIH NIAMS, Bethesda. MD.
- July, 2005 *Graduate Pathology Education: What are we missing for a competent trainee product for the future?* Annual Summer Meeting, Association of Pathology Chairs, Mont-Tremblant Quebec, Canada.
- October, 2005 *Overview of Antibody and Peptide Phage Display.* Program on Applications of Phage Display to Blood Transfusion Medicine, 58th Annual Meeting of the American Association of Blood Banks, Seattle, WA.
- October, 2005 *Cutting-Edge Technologies in Apheresis.* Board of Penn Medicine. Fall meeting, Philadelphia, PA.
- October, 2005 *Transfusion Medicine Overview.* Grand Rounds, Department of Anesthesiology and Critical Care, Hospital of the University of Pennsylvania, Philadelphia, PA.
- October, 2005 *Dissecting the Immunobiology of ITP.* Annual UPenn CME Course entitled, “New Insights into Coagulation”, Philadelphia, PA.
- November, 2005 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 2005 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.
- February, 2006 *Transfusion Medicine Overview.* Grand Rounds, Department of Obstetrics and Gynecology, Hospital of the University of Pennsylvania, Philadelphia, PA.
- May, 2006 *Cloning and Characterization of Human Monoclonal Autoantibodies in TTP.* 27th Annual Meeting of the American Society for Apheresis, Las Vegas, NV.
- September, 2006 *Overcoming limitations in current pre-transfusion compatibility testing methods using phage display technology.* FDA Workshop on Molecular Methods in Immunohematology, Bethesda, MD.
- November, 2006 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 2006 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.
- December, 2006 *Phage Display Tools for Diagnosis and Therapy.* Sanofi-Aventis, Inc., Bridgewater, New Jersey.
- December, 2006 *Inhibitory ADAMTS13 Monoclonal Autoantibodies Cloned from TTP Patients Show Restricted Gene Usage, Inhibit Murine ADAMTS13, and are Blocked by Rabbit Anti-Idiotypic Antibodies.* 48th Annual Meeting of the American Society for Hematology, Orlando, FL.

- January, 2007 *Phage Display Tools for Inhibiting Platelet Activation in TTP and Other Thrombotic Disorders*, Human Translational Immunology Speaker Series, University of Pennsylvania, Philadelphia, PA.
- March, 2007 *Immunobiology of Immune Thrombocytopenias*, Grantees' Meeting for SCCOR in Hemostasis and Thrombotic Disease, NHLBI, NIH, Bethesda, MD.
- April, 2007 *Phage Display Tools for Inhibiting Platelet Activation in TTP*. Grand Rounds, Department of Pathology & Laboratory Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA.
- June, 2007 *Blood Bank and Transfusion Medicine Overview*. Grand Rounds, Department of Neurosurgery, Hospital of the University of Pennsylvania, Philadelphia, PA.
- July, 2007 *Blood Bank and Transfusion Medicine Overview*. Grand Rounds, Department of Emergency Medicine, Hospital of the University of Pennsylvania, Philadelphia, PA.
- October, 2007 *Thrombotic Thrombocytopenic Purpura*. Cytopenias in 2007: Emphasis on ITP, San Diego, CA.
- November, 2007 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 2007 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.
- December, 2007 *Characterizing the Humoral Autoimmune Response in a Thrombotic Disorder: TTP as a Paradigm*. Scientific Subcommittee Meeting Education Session, 49th Annual Meeting of the American Society for Hematology, Atlanta, GA.
- January, 2008 *Effective Use of Clinical Laboratory Tests*. Group for Research in Pathology Education, Annual Meeting, Philadelphia, PA.
- April, 2008 *How Diversity in Humoral Immune Response is Generated*. Immunohematology Reference Laboratory National Conference, American Red Cross, Scottsdale, AR.
- April, 2008 *Clinical Aspects of Autoimmune Hemolytic Anemia*. Immunohematology Reference Laboratory National Conference, American Red Cross, Scottsdale, AR.
- April, 2008 *Phage Display-Based High-Throughput Screening for Diagnostic and Therapeutic Antibody Discovery*. Department of Pathology & Laboratory Medicine Research Retreat, College of American Physicians, Philadelphia, PA.
- May, 2008 *Immunobiology of Immune Thrombocytopenias*. Grantees' Meeting for SCCOR in Hemostasis and Thrombotic Disease, NHLBI, NIH, Bethesda, MD.

- June, 2008 *Phage Display-Based High-Throughput Screening for Diagnostic and Therapeutic Antibody Discovery*. Academy of Clinical Laboratory Physicians and Scientists, Annual Meeting, Philadelphia, PA.
- September, 2008 *Transfusion Medicine Overview*. Grand Rounds, Department of Obstetrics and Gynecology, Hospital of the University of Pennsylvania, Philadelphia, PA.
- October, 2008 *A Interesting Prenatal Workup*. Medical Advisory Committee Meeting, American Red Cross, Penn-Jersey Region, Philadelphia.
- October, 2008 *Research Opportunities for Transfusion Medicine Residents and Fellows*, Session on Fellowship Training in Transfusion Medicine, 60th Annual Meeting of the American Association of Blood Banks, Montreal, Canada.
- November, 2008 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 2008 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.
- February, 2009 *Transfusion Reactions*. Grand Rounds, Department of Obstetrics and Gynecology, Hospital of the University of Pennsylvania, Philadelphia, PA.
- February, 2009 *What Role Do B Cells Play in Autoimmunity?* Haematological Aspects of Autoimmune Diseases, European School of Haematology, Mandelieu, France.
- March, 2009 *Building a New Blood Bank*. Medical Advisory Committee Meeting, American Red Cross, Penn-Jersey Region, Philadelphia.
- April, 2009 *Transfusion-Associated Acute Lung Injury*. Grand View Hospital, Sellersville, PA.
- April, 2009 *Use of Phage Display to Develop Therapeutic Antibodies for the Treatment of TTP, a Potentially Fatal Autoimmune Thrombotic Disorder* 11th Annual Phage Display of Antibodies and Peptides, PEGS Protein Engineering Summit, Boston, MA.
- June, 2009 *Immunobiology of Immune Thrombocytopenias*. Grantees' Meeting for SCCOR in Hemostatic and Thrombotic Disease, NHLBI, NIH, Bethesda, MD.
- June, 2009 *State of the Art on Antibody-Mediated Autoimmunity*. Keynote Lecture, International Pemphigus Meeting, Berne, Switzerland.
- September, 2009 *Transfusion-Related Acute Lung Injury*. Cytopenias and Hemostasis in 2009, Orlando, FL.
- November, 2009 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 2009 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.

- December, 2009 *Transfusion Medicine Overview: Blood Components, Indications, and Risks.* Medical Grand Rounds, Wilmington VA Medical Center, Wilmington, DE.
- January, 2010 *Phage Display.* Molecular and Cellular Biology Seminar Series, School of Graduate Studies, SUNY Downstate Medical Center, Brooklyn, NY.
- April, 2010 *TTP: New Developments in Understanding Its Pathophysiology and in Designing More Effective Therapies.* New Frontiers in Transfusion Medicine, Brown University, Providence, RI.
- April, 2010 *Phage Display.* Program in Targeted Therapeutics “Work in Progress” seminar series, Institute for Translational Medicine and Therapeutics, University of Pennsylvania, Philadelphia, PA.
- April, 2010 *Phage Display.* Rheumatology Division, Department of Pediatrics, Children’s Hospital of Philadelphia, Philadelphia, PA.
- June, 2010 *Immunobiology of Immune Thrombocytopenias.* Grantees’ Meeting for SCCOR in Hemostatic and Thrombotic Disease, NHLBI, NIH, Bethesda, MD.
- October, 2010 *Cellular and Molecular (Phage Display) Methods for Producing Monoclonal Antibodies.* 2010 United States Anti-Doping Agency Symposium, Leesburg, VA.
- October, 2010 *Use of Mouse Models to Study the Role ADAMTS13 Plays in Thrombotic Disorders.* Program on Mouse Models in Transfusion Medicine: Hematological Disorders, 2010 Annual Meeting of the AABB, Baltimore, MD.
- November, 2010 *The Expanding Scope of Transfusion Medicine.* Western and Midwestern APC/PDAS Annual Meeting, Kamuela, Hawaii.
- November, 2010 *Use of Phage Display Technologies for Developing Diagnostic Reagents.* Western and Midwestern APC/PDAS Annual Meeting, Kamuela, Hawaii.
- November, 2010 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting.* 2010 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.
- January, 2011 *Use of Phage Display for Developing Blood Bank Reagents and for Understanding Autoimmune Disorders Relevant to Transfusion Medicine.* Department of Transfusion Medicine Grand Rounds, NIH Clinical Research Center, Bethesda, MD.
- February, 2011 *Phage Display Technology: Application to the Study of Human Autoimmune Disorders.* Grand Rounds, Department of Pathology & Laboratory Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA.

- June, 2011 *The Evolving Roles of Apheresis and Transfusion Medicine in Cellular Therapies*. Plenary Session, 2011 Annual Meeting of the American Society for Apheresis, Scottsdale, AR.
- June, 2011 *The Expanding Role of Pathologists in Personalized Medicine and Therapeutics*. Eleventh Annual Peter S. Amenta, M.D., Ph.D. Lectureship in Pathology, Annual Graduation Ceremony, Department of Pathology & Laboratory Medicine, Robert Wood Johnson Medical School, New Brunswick, NJ.
- October, 2011 *"Hit and Run" Gene/Cell Therapy Protocol for HIV Using Zinc Finger Endonucleases*, Scientific Hot Topics in Transfusion Medicine, Annual Meeting of the American Association of Blood Banks, San Diego, CA.
- November 2011 *The Evolving Roles of Apheresis and Transfusion Medicine in Cellular Therapies*, Fenwal, Inc., Lake Zurich, IL.
- November, 2011 *The Expanding Role of Transfusion Medicine in Personalized Medicine and Therapeutics*, Laboratory Medicine Grand Rounds, Department of Laboratory Medicine, University of Washington School of Medicine. Seattle, WA.
- April, 2012 *Developing Novel Therapies for TTP*, Plenary Session, 2012 Annual Meeting of the American Society for Apheresis, Atlanta, Georgia.
- May, 2012 *The Expanding Role of Transfusion Medicine in Personalized Medicine and Therapeutics*, ASCLS-PA State Spring Meeting, University of the Sciences, Philadelphia, PA.
- October, 2012 *Transfusion Medicine Physicians Career Development and Networking Dinner*, Featured Speaker, 2012 Annual Meeting of the American Association of Blood Banks, Boston, MA.
- October, 2012 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 2012 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.
- February, 2013 *Immunobiology of Thrombotic Thrombocytopenic Purpura (TTP)*, Grand Rounds, Division of Laboratory and Genomic Medicine, Department of Pathology and Immunology, Washington University School of Medicine, St. Louis, MO.
- October, 2013 *The Evolving Roles of Transfusion Medicine and Cellular Engineering for Hematologic Disorders*, Inaugural Annual Blood Center Symposium, The Penn-CHOP Blood Center for Patient Care & Discovery
- October, 2013 *Clinical Vaccine Production Facility at the Hospital of the University of Pennsylvania: Bench to Bedside in an Existing Hospital*, 7th Annual Conference, Academic Medical and Health Science Centers 2013, Orlando, FL.
- November, 2013 *Phage Display Approaches for Devising New Translational Affinity Moieties for*

Drug Targeting, Center for Targeted Therapeutics & Translational Nanomedicine, 2013 Annual Symposium, Philadelphia, PA.

- November, 2013 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 2013 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.
- December, 2013 *Immunobiology of Thrombotic Thrombocytopenic Purpura (TTP)*, Weekly Seminar Series, Penn-CHOP Blood Center for Patient Care & Discovery.
- January, 2014 *Immunobiology of Thrombotic Thrombocytopenic Purpura (TTP)*, Division of Laboratory Medicine Seminar Series, Department of Pathology & Cell Biology, Columbia University College of Physicians and Surgeons, New York, NY.
- February, 2014 *Update on Hematopoietic Stem Cell Transplantation*, 2nd Annual UC San Diego Essentials & Advances in Apheresis Therapies, San Diego, CA.
- February, 2014 *The Evolving Role of Cell Therapies*, 2nd Annual UC San Diego Essentials & Advances in Apheresis Therapies, San Diego, CA.
- February, 2014 *Cell Harvest, Bone Marrow Transplantation, Advanced Cell Uses, Graft-v-Host Disease*, Breakfast with the Experts, 2nd Annual UC San Diego Essentials & Advances in Apheresis Therapies, San Diego, CA.
- April, 2014 *Engineering Apheresis-Derived T Cells to Treat Cancer*, 2014 Annual Meeting of the American Society for Apheresis, San Francisco, CA.
- August, 2014 *Medullary Thyroid Cancer and (Very) Personalized Medicine*, Scripps Research Institute, La Jolla, CA.
- September, 2014 *Personalized Drugs of the Future: Apheresis Medicine-enhanced Gene and Cell Therapy*, International Society for Blood Purification and Therapeutic Apheresis Academy 2014 Joint Conference, National Harbor, MD.
- September, 2014 *Phage Display, Metastatic Cancer, and (Very) Personalized Medicine*, New England Biolabs, Ipswich, MA.
- October, 2014 *Facility Considerations: Video Presentation from U Penn*, Workshop on CAR T Cell Adoptive Therapies: Product Engineering to Clinical Outcomes, 2014 Annual Meeting of the AABB, Philadelphia, PA.
- November, 2014 *Isolation of Cell Surface-Specific Human Monoclonal Antibodies Using Phage Display and Magnetically-Activated Cell Sorting*. 2014 Cold Spring Harbor Laboratory Course on Phage Display of Peptides and Proteins, Cold Spring Harbor, NY.

- December, 2014 *Use of Phage Display to Characterize the Immunobiology of TTP, a potentially fatal clotting disorder*, The Donnelly Centre, University of Toronto, Toronto, Ontario.
- April, 2015 *Transfusion Medicine: It's Better to Give than to Receive*, Internal Medicine 2015, American College of Physicians, Boston, MA.
- September, 2015 *Characterization of pathogenic autoantibodies in a potentially fatal autoimmune disease: TTP as a paradigm*, New Therapies for Pemphigus and their Underlying Science, Paris France.
- November, 2015 *Human phage display libraries, cell surfacing panning, translational medicine applications, and llamas*. 2015 Cold Spring Harbor Laboratory Course on Antibody Engineering and Phage Display, Cold Spring Harbor, NY.
- November, 2015 *Phage Display-Derived Antibodies for Personalized Chimeric Antigen Receptor T-Cell Therapy*. 2015 Cold Spring Harbor Laboratory Course on Antibody Engineering and Phage Display, Cold Spring Harbor, NY.
- April, 2016 *Phage Display, Metastatic Cancer, and CART Therapy for Medullary Thyroid Cancer*, Pathology Grand Rounds, Virginia Commonwealth University, Richmond, VA.
- July, 2016 *CART Therapy for Medullary Thyroid Cancer*, REACT Thyroid Cancer Foundation, Annual Meeting, Chicago, IL.
- October, 2016 *Overview of Role of Apheresis in Cell Therapy Manufacturing*, Workshop 4: Leaving the Single-Center Orbit: New Horizons in Clinical Cell Therapy, International Society for Cell Therapy North American 2016 Regional Meeting, Memphis, TN.
- October, 2016 *The Evolving Role of the Blood Bank/Transfusion Medicine Specialist in the Development and Administration of Novel Cell Therapies*, Workshop 6: Cell Therapy Professional Development, International Society for Cell Therapy North American 2016 Regional Meeting, Memphis, TN.
- October, 2016 *cGMP Laboratory Basics*, 2016 Annual Meeting of the AABB, Orlando, FL.
- November, 2016 *Translational Aspects of Antibody Phage Display*, 2016 Cold Spring Harbor Laboratory Course on Antibody Engineering, Phage Display & Immune Repertoire Analysis, Cold Spring Harbor, NY.
- December, 2016 *Careers in Transfusion Medicine*, 2016 Meeting of the American Society for Hematology, San Diego, CA.
- January, 2017 *Phage-Display Derived Tools for Glioblastoma Immunotherapy*, Grand Rounds, Department of Neurosurgery, Hospital of the University of Pennsylvania, Philadelphia, PA.

- January, 2017 *Use of Chimeric Antigen Receptor T Cells (CAR-T) for Cancer Immunotherapy*, Grand Rounds, Department of Neurosurgery, SUNY Stony Brook, Stony Brook, NY.
- January, 2017 *Pre-Procedural Use of FFP*, Clinical Controversies, Grand Rounds, Department of Medicine, Hospital of the University of Pennsylvania, Philadelphia, PA.
- March, 2017 *Phage Display-Derived Antibodies for Personalized Chimeric Antigen Receptor T-Cell Therapy*, Tri-Institutional Therapeutics Discovery Institute Antibody Discover Seminar, Memorial Sloan Kettering Cancer Center/The Rockefeller University/Weill Cornell Medicine, New York, NY.
- May, 2017 *Use of Chimeric Antigen Receptor T-Cells (CAR-T) for Cancer Immunotherapy*, Department of Biomedical Engineering, University of Southern California, Los Angeles, CA.
- May, 2017 *Phage Display-Derived Antibodies for Personalized Chimeric Antigen Receptor T-Cell Therapy*, Cancer Biology Program, The Scripps Research Institute, Jupiter, FL.
- June, 2017 *Appropriate Transfusion of Red Blood Cells and Platelets – Lessons for the Oncologist*, 2017 Hematology for the Practicing Oncologist, 2017 Meeting of the American Society of Clinical Oncology, Chicago, IL.
- October, 2017 *Cellular Therapy Development – Target Identification, Vector Design, and Manufacture*, Session on How to Make a Cellular Immunotherapy”, 2017 Meeting of the AABB, San Diego, CA.
- October, 2017 *Translational Aspects of Antibody Phage Display*, 2017 Cold Spring Harbor Laboratory Course on Antibody Engineering, Phage Display & Immune Repertoire Analysis, Cold Spring Harbor, NY.
- February, 2018 *CAR-T Technology*, KTH Royal Institute of Technology and AlbaNova University Center, Stockholm.
- February, 2018 *CARLOS (Chimeric Antigen Receptor Lymphocytes with Oncolytic Specificity)*, KTH Royal Institute of Technology and AlbaNova University Center, Stockholm.
- March, 2018 *CAR-T Cell Therapy*, 14th Annual Tucson Symposium 2018, Tucson, AZ.
- April, 2018 *The Evolving Role of the Transfusion Medicine Specialist in the Development and Use of Novel Engineered Cell Therapies*, Grand Rounds, Pathology & Laboratory Medicine, University of Rochester Medical Center, Rochester, NY.
- May, 2018 *Engineering Apheresis-Derived Mononuclear Cells to Treat Cancer and Autoimmune Disease*, Francis S. Morrison, MD Memorial Lectureship, 2018 Meeting of the American Society for Apheresis, Chicago, IL.

- June, 2018 *Engineering Apheresis-Derived Mononuclear Cells to Treat Cancer and Autoimmune Disease*, Pathology Grand Rounds, Brown University, Providence, RI.
- November, 2018 *Personalized Therapy and Cellular Engineering*, Board of Women's Visitors, Hospital of the University of Pennsylvania, Philadelphia, PA.
- November, 2018 *New Approaches for the Development of Treatments for Thrombotic Thrombocytopenic Purpura*, The Ree Wynn Foundation, Mt. Laurel, NJ.
- December, 2018 *Blood Doping in High-Performance Sport: a Chemical and Transfusion Medicine Arms Race*, 60th Annual Meeting of the American Society for Hematology, San Diego, CA.
- December, 2018 *Phage Display-Derived Antibody Fragments for CAR-T Design*. Center for Cellular Immunotherapies Data Session, University of Pennsylvania, Philadelphia, PA.
- March, 2019 *Overview & Update on CAR-T Cell Therapies*, Plenary Session, 2019 Essentials and Advances in Apheresis Therapies, San Diego, CA.
- March, 2019 *Generating New Cell Therapies from Scratch*, 2019 Essentials and Advances in Apheresis Therapies, San Diego, CA.
- March, 2019 *Updates in the Management of TTP*, 2019 Essentials and Advances in Apheresis Therapies, San Diego, CA.
- March, 2019 *Chimeric Antigen Receptor T-Cells for Treating Cancer and Autoimmune Disease*, Keynote Speaker, Robert and Jean Adams Clinical Laboratory Sciences Symposium, Auburn University, Montgomery, AL.
- March, 2019 *Chimeric Antigen Receptor T-Cells for Treating Cancer and Autoimmune Disease*, Grand Rounds, Department of Pathology, University of Alabama at Birmingham, Birmingham, AL.
- May, 2019 *CAR-T Therapy Beyond Cancer*, Scientific Symposium, 2019 Meeting of the American Society for Apheresis, Portland, OR.
- June, 2019 *Chimeric Antigen Receptor T-Cells for Treating Cancer and Autoimmune Disease*, Medical Grand Rounds, University of Massachusetts Medical School, Worcester, MA.
- June, 2019 *Use of Chimeric Antigen Receptor T-Cells (CAR-T) for Cancer Immunotherapy and Autoimmune Disease*, Grand Rounds, Department of Pathology, Stanford University School of Medicine, Stanford, CA.

Organizing Roles in Scientific Meetings:

- Nov 1999- Coordinator, 4th International Workshop on Monoclonal Antibodies Against

- July 2001 Human Red Blood Cells and Related Antigens, Paris (meeting July 20-21, 2001).
- Oct 2004-
May 2006 Scientific Program Co-coordinator, 27th Annual Meeting of the American Society for Apheresis, Las Vegas, NV (meeting May 25-27, 2006).
- Feb 2005-
Oct 2005 Program Coordinator, “Applications of Phage Display to Blood Transfusion Medicine”, Annual Meeting of the American Association of Blood Banks, Seattle, WA (meeting October 15-18, 2005).
- Jan 2009-
Jun 2009 Co-coordinator, Immunology Workshop, International Pemphigus Meeting, Berne, Switzerland (meeting June 26-29, 2009).
- Nov 2009-
Apr 2010 Co-coordinator, New Frontiers in Transfusion Medicine, Brown University, Providence, R.I. (meeting April 24, 2010).
- July 2011-
Oct 2011 Program Coordinator, “Hit and Run” Gene/Cell Therapy Protocol for HIV Using Zinc Finger Endonucleases, Scientific Hot Topics in Transfusion Medicine, Annual Meeting of the American Association of Blood Banks, San Diego, CA (meeting October 22-25, 2011)
- June 2012-
May 2013 Scientific Program Coordinator, 34th Annual Meeting of the American Society for Apheresis, Denver, CO (meeting May 22-25, 2013).
- Nov 2013-
Oct 2014 Workshop on CAR T Cell Adoptive Therapies: Product Engineering to Clinical Outcomes, 2014 Annual Meeting of the AABB, Philadelphia, PA

Bibliography:

Research Publications, peer reviewed:

- Palatt P.J., Prusch R.D., **Siegel D.L.**: The diffusional and osmotic water permeability of the hindgut cuticle of larval *Sarcophaga bullata*, *J Insect Physiology* 23:1113-1116, 1977.
- Siegel D.L.**, Goodman S.R., Branton D.: The effect of endogenous proteases on the spectrin binding proteins of human erythrocytes, *Biochimica Biophysica Acta* 598:517-527, 1980.
- Siegel D.L.**: Human erythrocyte band 4.9, Ph.D. Thesis, Harvard University, 1983.
- Siegel D.L.**, Branton D.: Partial purification and characterization of an actin-bundling protein, band 4.9, from human erythrocytes, *J Cell Biology* 100:775-785, 1985.
- Siegel D.L.**, Fox I., Asplund M., Dafoe D., Power M., Zellers L., Barker C.F., Prystowsky M.: Distinguishing rejection from CMV infection in renal transplant recipients using flow cytometry, *Clinical Immunol Immunopath* 51:157-171, 1989.
- Siegel D.L.**, Edelstein P.H., Nachamkin I.: Inappropriate utilization of microbiologic tests for the diagnosis of diarrheal disease in hospitalized adult patients, *JAMA* 263:979-982, 1990.

- Siegel D.L.**, Silberstein L.E.: Expression and characterization of recombinant anti-Rh(D) antibodies on filamentous phage: A model system for isolating human red cell antibodies by repertoire cloning, *Blood* 83:2334-2344, 1994.
- Czerwinski M, **Siegel D.L.**, Moore J.S., Spitalnik P.F., Spitalnik S.L.: Construction of bacteriophage expressing mouse monoclonal Fab fragments against the human MN glycoprotein blood group antigens, *Transfusion* 35:137-144, 1995.
- Siegel D.L.**: Isolation of human anti-red blood cell antibodies by repertoire cloning, *Annals of the New York Academy of Sciences* 764:547-558, 1995.
- Wojczyk B.S., Czerwinski M., Stwora-Wojczyk M.M., **Siegel D.L.**, Abrams W.R., Wunner W.H., Spitalnik S.L.: Purification of a secreted form of recombinant rabies virus glycoprotein: Comparison of two affinity tags, *Protein Expression and Purification* 7:183-193, 1996.
- Pereira S., Van Belle P., Elder D., Maruyama H., Jacob L., Sivanandham M., Wallack M., **Siegel D.L.**, and Herlyn D.: Combinatorial antibodies against human malignant melanoma, *Hybridoma* 16:11-16, 1997.
- Pereira S., Maruyama H., **Siegel D.L.**, Van Belle P., Elder D., Curtis P., Herlyn D.: A model system for detection and isolation of a tumor cell surface antigen using antibody phage display, *J Immunological Methods* 203:11-24, 1997.
- Siegel D.L.**, Chang, T.Y., Russell, S., Bunya, V.Y.: Isolation of cell surface-specific human monoclonal antibodies using phage display and magnetically-activated cell sorting: Applications in immunohematology, *J Immunological Methods* 206:73-85, 1997.
- Wang L., Radic M.Z., **Siegel D.L.**, Chang T., Bracy J., Galili U.: Cloning of anti-Gal Fabs from combinatorial phage display libraries: Comparison of Fab expression in pComb3H and pComb8 phage, *Molecular Immunology* 34:609-618, 1997.
- Siegel D.L.**: The human immune response to red blood cell antigens as revealed by repertoire cloning, *Immunologic Research* 17:239-251, 1998.
- Chang T.Y., **Siegel D.L.**: Genetic and immunological properties of phage-displayed human anti-Rh(D) antibodies: Implications for Rh(D) epitope topology, *Blood* 91:3066-3078, 1998.
- Czerwinski M., Siemaszko D., **Siegel D.L.**, Spitalnik S.L.: Only selected light chains combine with a given heavy chain to confer specificity for a model glycopeptide antigen, *J Immunology* 160:4406-4417, 1998.
- Czerwinski M., Krop-Watorek A, **Siegel D.L.**, Spitalnik S.L. A molecular approach for isolating high affinity Fab fragments useful in blood group serology, *Transfusion* 39:364-371, 1999.
- Arepally G.M., Kamei S., Park K.S., Kamei K., Li Z.Q., Liu W., **Siegel D.L.**, Kisiel W., Cines D.B., Poncz M.: Preparation and characterization of a murine monoclonal antibody that mimics heparin-induced thrombocytopenia (HIT) antibodies, *Blood* 93: 110-118, 2000. (Plenary Paper)

- Chang T.Y., **Siegel D.L.**: Isolation of an anti-B IgG from a Fab-phage display library, *Transfusion* 41:6-12, 2001.
- Roark J.H., Bussel J.B., Cines D.B., **Siegel D.L.**: Genetic analysis of autoantibodies in ITP reveals evidence of clonal expansion and somatic mutation, *Blood* 100:1388-1398, 2002.
- Westhoff C.M., Burd C., **Siegel D.L.**, Foskett J.K.: Evidence that the erythrocyte Rh-blood group glycoprotein functions as an NH₄⁺/H⁺ exchanger, *J Biol Chem* 279:17443-17448, 2004.
- Silverman G.J., Goodyear C.S., and **Siegel D.L.**: On the mechanism of Staphylococcal protein A immunomodulation, *Transfusion* 45:274-280, 2005.
- Payne A.S., Ishii K., Kacir S., Lin C., Li H., Hanakawa Y., Tsunoda K., Amagai M., Stanley J.R., **Siegel D.L.**: Genetic and functional characterization of human pemphigus vulgaris monoclonal autoantibodies isolated by phage display, *J Clinical Invest* 115:888-899, 2005.
- Andreadis C., Schuster S.J., Chong E.A., Svoboda J., Luger S.M., Porter D.L., Tsai D.E., Nasta S.D., Elstrom R.L., Goldstein S.C., Downs L.H., Mangan P.A., Cunningham K.A., Hummel K.A., Gimotty P.A., **Siegel D.L.**, Glatstein E., Stadtmauer E.A.: Long-term event-free survivors after high-dose therapy and autologous stem-cell transplantation for low-grade follicular lymphoma, *Bone Marrow Transplantation* 36:955-961, 2005.
- Kucher C., Steere J., Elenitas R., **Siegel D.L.**, Xu X.: Nephrogenic fibrosing dermatopathy/nephrogenic systemic fibrosis with diaphragmatic involvement in a patient with respiratory failure, *J Amer Acad Derm* 54:S31-4, 2006.
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Commercialization of UPenn Intellectual Property:

2003 Founder, PhenoTech, Inc., a UPenn biotech start-up company

2018 Founder, VetIGenics, Inc., a UPENN biotech start-up company

RESEARCH FUNDING**Current funding:**

T32-HL07775 (P.I. Siegel) NIH Transfusion Medicine Research Training Program Role: Principal Investigator	7/1/94 - 6/30/24
Tmunity (P.I. Siegel) Chimeric Antigen T Cells for Medullary Thyroid Cancer Role: Principal Investigator	4/1/18 – 3/31/19
REACT Thyroid Foundation (P.I. Siegel) GFRalpha-4 Targeted Chimeric Antigen Receptor T-Cells for Medullary Thyroid Cancer Role: Principal Investigator	7/1/17 – 6/30/19
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