

**Joseph S. Friedberg, MD, FACS**  
**CURRICULUM VITAE**

**April 2015**

**Office Address:** University of Maryland Medical Center  
Division of Thoracic Surgery  
29 South Green Street, Suite 504  
Baltimore, Maryland 21201  
Phone: (215) 432-1991  
E-Mail: jfriedberg@smail.umaryland.edu

**Citizenship:** United States of America

**Education:**

1977 – 1981	BASc University of Pennsylvania College of Engineering and Applied Science, <i>summa cum laude</i> (4.0 GPA)
1981 – 1986	MD Harvard Medical School, <i>cum laude</i>

**Postdoctoral Training and Fellowship Appointments:**

1984 – 1985	Grunnenbaum Research Fellow (Dr. Judah Folkman, project supervisor), Harvard Medical School, Boston, MA
1986 – 1987	Surgical Internship, Massachusetts General Hospital, Boston, MA
1987 – 1988	Resident in Otolaryngology, Massachusetts Eye and Ear Infirmary, Boston, MA
1988 – 1989	Resident in General Surgery, Massachusetts General Hospital, Boston, MA
1989 – 1991	Claude Welch Research Fellow, Massachusetts General Hospital, Boston, MA
1991 – 1994	Resident in General Surgery, Massachusetts General Hospital, Boston, MA
1994 – 1996	Fellowship in Cardiothoracic Surgery, Brigham and Women's Hospital (Thoracic Track), Boston, MA

**Specialty Certification:**

1996 - present	Certified, American Board of Surgery (recertification 2006)
1997 - present	Certified, American Board of Thoracic Surgery (recertification 2007)

**Licensure:**

1996 - present	Pennsylvania
2015 – present	Maryland

**Faculty Appointments:**

1996 – 2001	Assistant Professor of Surgery, University of Pennsylvania School of Medicine, Philadelphia, PA
2001 – 2004	Associate Professor of Surgery, Thomas Jefferson University, Philadelphia, PA
2004 – 2013	Associate Professor of Surgery, University of Pennsylvania School of Medicine, Philadelphia, PA
2013 – 2014	Professor of Surgery, University of Pennsylvania School of Medicine, Philadelphia, PA
2015 – present	Charles Reid Edward Professor of Surgery, University of Maryland School of Medicine, Baltimore, MD

**Hospital and Administrative Appointments:**

1996 – 2001	Attending Thoracic Surgeon, Division of Cardiothoracic Surgery, Hospital of the University of Pennsylvania, Philadelphia, PA
1996 – 2001	Attending Thoracic Surgeon, Division of Cardiothoracic Surgery, Penn-Presbyterian Medical Center, Philadelphia, PA
1998 – 2001	Attending Thoracic Surgeon, Division of Cardiothoracic Surgery, Pennsylvania Hospital, Philadelphia, PA
2001 – 2004	Attending Thoracic Surgeon and Chief, Division of Thoracic Surgery, Thomas Jefferson University Hospital, Philadelphia, PA
2004 – 2014	Attending Thoracic Surgeon and Chief, Section of Thoracic Surgery, Penn-Presbyterian Medical Center, Philadelphia, PA
2004 – 2014	Attending Thoracic Surgeon, Division of Thoracic Surgery, Hospital of the University of Pennsylvania, Philadelphia, PA
2004 – 2014	Attending Thoracic Surgeon, Division of Thoracic Surgery, Veterans Affairs Medical Center, Philadelphia, PA
2004 – 2014	Attending Thoracic Surgeon, Section of Thoracic Surgery, Pennsylvania Hospital, Philadelphia, PA
2004 – 2014	Director, Penn Presbyterian Medical Center Thoracic Intermediate Care Unit (TICU), Philadelphia, PA
2008 – 2014	Director, Penn Mesothelioma and Pleural Program, Philadelphia, PA
2015 – present	Thoracic Surgeon in Chief – University of Maryland Medical System, Baltimore, MD

**Specialty Certification:**

1996-present	Certified, American Board of Surgery (recertification 2015)
1997-present	Certified, American Board of Thoracic Surgery (recertification 2015)

**Awards and Honors:**

1971-1977	Allentown City Tennis Champion in respective age bracket 6 out of 7 consecutive years from ages 12-18
1977	Emmaus High School Varsity Tennis Team, Captain
1977	Emmaus High School Faculty Award, Most Outstanding Chemistry Student
1977	Emmaus High School Lions Club Award, Most Outstanding Science Student
1978	Elected "Most Inspirational Freshman Oarsman," University of Pennsylvania Heavyweight Crew
1981	Pennsylvania Electorate, Regional Finalist for Rhodes Scholarship
1981	University of Pennsylvania Benjamin Franklin Scholar
1981	Captain University of Pennsylvania Heavyweight Crew
1981	Elected "Most Inspirational Varsity Oarsman," University of Pennsylvania Heavyweight Crew
1981	University of Pennsylvania Wreath Hopkins Award Recipient
1981	University of Pennsylvania BAsC, <i>Summa Cum Laude</i> (4.0 GPA)
1981 - 1986	Boston Marathon finisher, five consecutive years
1981	United States Maccabiah Team, Rowing, 2 Gold Medals
1985	United States Maccabiah Team, Rowing, 1 Gold, 1 Silver Medal
1986	Harvard Medical School Soma Weiss Research Award recipient (Dr. Judah Folkman, research advisor)
1986	Harvard Medical School MD, <i>Cum Laude</i>
1998	Association for Academic Surgery Medical Student Research Award (Mentor to student recipient, Eric Baum)
2001	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2002	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2003	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2004	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2005	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2006	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2007	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2008	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2009	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2010	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2011	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2012	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2013	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2014	<i>Philadelphia Magazine</i> – Thoracic Surgery "Top Doc"
2002	Poster of Distinction, Thoracic Oncology Category, Chest Meeting
2003	Poster of Distinction, Critical Care Category, Chest Meeting
2004	Society for Artificial Internal Organs Fellowship Award (Research mentor to fellow recipient, Shamus Carr)
2005	<i>Castle Connolly</i> – America's Top Doctors, Thoracic Surgery
2006	<i>Castle Connolly</i> – America's Top Doctors, Thoracic Surgery
2007	<i>Castle Connolly</i> – America's Top Doctors, Thoracic Surgery

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- 2008 *Castle Connolly* – America’s Top Doctors, Thoracic Surgery  
2009 *Castle Connolly* – America’s Top Doctors, Thoracic Surgery  
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2012 *Castle Connolly* – America’s Top Doctors, Thoracic Surgery  
2013 *Castle Connolly* – America’s Top Doctors, Thoracic Surgery  
2014 *Castle Connolly* – America’s Top Doctors, Thoracic Surgery  
2006 *Castle Connolly* – America’s Top Doctors for Cancer  
2007 *Castle Connolly* – America’s Top Doctors for Cancer  
2008 *Castle Connolly* – America’s Top Doctors for Cancer  
2009 *Castle Connolly* – America’s Top Doctors for Cancer  
2010 *Castle Connolly* – America’s Top Doctors for Cancer  
2011 *Castle Connolly* – America’s Top Doctors for Cancer  
2012 *Castle Connolly* – America’s Top Doctors for Cancer  
2013 *Castle Connolly* – America’s Top Doctors for Cancer  
2014 *Castle Connolly* – America’s Top Doctors for Cancer  
2015 *Castle Connolly* – America’s Top Doctors for Cancer  
2009 Consumers’ Research Council of America “Guide to America’s Top Surgeons”  
2009 Marquis Who’s Who in America  
2010 Marquis Who’s Who in America  
2011 Marquis Who’s Who in America  
2012 Marquis Who’s Who in America  
2013 Marquis Who’s Who in America  
2009 Marquis Who’s Who in Medicine and Healthcare  
2010 Marquis Who’s Who in Medicine and Healthcare  
2011 Marquis Who’s Who in Medicine and Healthcare  
2012 Marquis Who’s Who in Medicine and Healthcare  
2013 Marquis Who’s Who in Medicine and Healthcare  
2009 Marquis Who’s Who in Medicine and Healthcare  
2009 Marquis Who’s Who in the World  
2010 Marquis Who’s Who in the World  
2011 Marquis Who’s Who in the World  
2012 Marquis Who’s Who in the World  
2013 Marquis Who’s Who in the World  
2010 Marquis Who’s Who in Science and Engineering  
2011 Marquis Who’s Who in Science and Engineering  
2012 Marquis Who’s Who in Science and Engineering  
2013 Marquis Who’s Who in Science and Engineering  
2012 US News and World Report, “Top Cardiac and Thoracic Surgeons.”  
2013 US News and World Report, “Top Cardiac and Thoracic Surgeons.”  
2009 Listed in “Best Doctors” ([www.Bestdoctors.com](http://www.Bestdoctors.com))  
2010 Listed in “Best Doctors” ([www.Bestdoctors.com](http://www.Bestdoctors.com))  
2011 Listed in “Best Doctors” ([www.Bestdoctors.com](http://www.Bestdoctors.com))  
2012 Listed in “Best Doctors” ([www.Bestdoctors.com](http://www.Bestdoctors.com))

2013 Listed in “Best Doctors” ([www.Bestdoctors.com](http://www.Bestdoctors.com))

**Memberships in Professional and Scientific Societies:**

2003 - present American Association of Thoracic Surgeons  
2003 - present American College of Surgeons (Fellow)  
2001- present Massachusetts General Hospital Alumni Society  
2001 - present Society of Thoracic Surgeons  
1998 - present General Thoracic Surgical Club

**Committees and Board Positions:**

2009 - 2010 The Society of Thoracic Surgeons – Workforce on Graduate Medical Education Committee  
2010 - 2011 International Society of Minimally Invasive Cardiothoracic Surgery Development Committee  
2009 - 2015 University of Pennsylvania Health System Proton Triage Committee  
2011 - present Pleural Malignancy Task Force – International Thymic Malignancy Interest Group (ITMIG)  
2009 – 2015 University of Pennsylvania Thoracic Oncology Leadership Committee  
2009 - 2010 Society of Thoracic Surgeons, Workforce on Graduate Medical Education Committee  
2009 - 2015 University of Pennsylvania Thoracic Oncology Leadership Committee  
2012 Ad Hoc Committee Member – National Cancer Institute Career Development Grants Study Section  
2011 - present Lead, Pleural Malignancy Task Force – International Thymic Malignancy Interest Group (ITMIG)  
2013 - 2015 University of Pennsylvania Abramson Cancer Center Philanthropy Council  
2013 - present Varian Medical Systems, Medical Advisory Board  
2014 – 2015 American Association of Thoracic Surgery Video Committee

**Editorial Positions:**

2009 - present Thoracic Surgery Section Editor, *UpToDate* ([www.uptodate.com](http://www.uptodate.com))  
2011 - present Editorial Board, *Science World Journal*  
2011 -present Editorial Board, *Lung Cancer Management Journal*  
2011 Lead Guest Editor, *Pulmonary Medicine*  
1997 - present Reviewer - *Annals of Thoracic Surgery*  
2003 - present Reviewer - *Journals of Thoracic and Cardiovascular Surgery*  
2006 - present Reviewer - *Journal of Surgical Research*  
1999 - present Reviewer - *Chest*

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2001 - present	Reviewer - <i>Clinical Cancer Research</i>
2005 - present	Reviewer - <i>Lung Cancer</i>
2009 - present	Reviewer - <i>Respiratory Physiology and Neurobiology</i>
2002 - present	Reviewer - <i>Journal of Surgical Oncology</i>
2010 - present	Reviewer, American Association of Thoracic Surgery – Abstract Review for Annual Meeting
2011 - present	Reviewer, Society of Thoracic Surgery – Abstract Review for Annual Meeting
2012	Reviewer, International Mesothelioma Interest Group – Abstract Review for 2012 International Meeting
2014	Reviewer, International Mesothelioma Interest Group – Abstract Review for 2014 International Meeting

**Teaching:**

1996	Author of thoracic prosection syllabus for University of Pennsylvania College of Medicine Anatomy Course (still currently in use)
1996 - 2001	Instructor, University of Pennsylvania College of Medicine Anatomy Course
1996 - present	Leader, Daily Clinical Teaching Rounds (nurses, physician assistants, medical students, residents, cardiothoracic fellows)
1996 - 2015	Didactic Thoracic Surgery Lectures for surgery residents, University of Pennsylvania Health System and Thomas Jefferson University
1997 - 2001	Lecturer, Thoracic Fellowship Didactic Series, University of Pennsylvania Health System
2004 - 2007	Didactic thoracic Surgery Lecturer, Transitional Residency, University of Pennsylvania Health System
2004 - 2015	Instructor, University of Pennsylvania College of Medicine Anatomy Course
2005	Demonstration surgery with temporary privileges (Radical Pleurectomy with Intraoperative Photodynamic Therapy), University of Taiwan Medical Center, Taipei, Taiwan
2009 - 2010	Mentor for Visiting Thoracic Surgeon, Dr. Sam Hsieh, on sabbatical from Shin-Kong Wu Ho-Su Memorial Hospital, Taiwan
2009 - present	Observational surgery experience (radical pleurectomy operation) provided for visiting surgeons from: United States, Germany, Canada, France, Singapore, Taiwan, Japan
2012	Mentor for Mr. Eric Wang, awardee of 2012 American Association for Thoracic Surgery Summer Intern Scholarship in Cardiothoracic Surgery
2012	Demonstration surgery with temporary privileges (Extrapleural Pneumonectomy), University of Utah Huntsman Cancer Institute, Salt Lake City, UT

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2013 Mentor for Mr. Warren Naselsky, recipient of 2013 University of North Carolina Medical Student Summer Internship Scholarship and awardee of 2013 American Association for Thoracic Surgery Summer Intern Scholarship in Cardiothoracic Surgery

**Other Academic Activities:**

2010 Associate Examiner – American Board of Surgery  
2011 Associate Examiner – American Board of Thoracic Surgery

**Invited Talks:**

1995 “Bimodal Therapies for Thoracic Cancers” Memorial Sloan Kettering Thoracic Surgery Grand Rounds, New York

1998 "Treatment of Stage IIIA Non-Small Cell Lung Cancer" Multimodality Therapy of Chest Malignancies: Update 1998” Brigham & Women's Hospital, Dana-Farber Cancer Institute, Harvard Joint Center for Radiation Therapy, Harvard Medical School, Boston, Massachusetts

1998 "Mesothelioma -Current Concepts and Treatment" Fifth Annual Heart and Lung Surgery Update, Lehigh Valley Hospital Allentown, Pennsylvania

1999 "Photodynamic Therapy for Stage IIIB Lung Cancer and Mesothelioma" STS Experts Meeting/Case Studies Roundtable San Antonio, Texas

1999 "More Therapies for Stage IIIB Lung Cancer" Invited discussant, American Association for Thoracic Surgery Postgraduate course, New Orleans, Louisiana

1999 "Minimally Invasive Surgery of the Esophagus - Mozart or Metallica" Gastroenterology Grand Rounds, Hospital at the University of Pennsylvania, Philadelphia, Pennsylvania

2000 "Detection of Early Lung Cancer: CT Scan or Chest X-Ray?" Invited discussant, 80th Annual Meeting, American Association for Thoracic Surgery, Toronto, Ontario, Canada

2000 “Of Light, Air Leaks and Fungus-One Man's Struggle Against Evil in the Chest” University of Pennsylvania, Surgical Ground Rounds Philadelphia, Pennsylvania

2000 “Advanced Surgical techniques for Lung Cancer" Pocono Medical Center East Stroudsburg, Pennsylvania

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- 2001 "The Role of the PET Scan in the Evaluation of the Patient with Suspected Lung Cancer," American College of Chest Physicians Meeting, Philadelphia, Pennsylvania
- 2001 "Surveillance and Treatment of Recurrence after Lung Cancer Resection" Invited discussant, American College of Surgeons Annual Scientific Meeting, October 8 -12, 2001, New Orleans, Louisiana
- 2001 "Of Light, Air Leaks and Fungus-One Man's Struggle Against Evil in the Chest" Thomas Jefferson University Surgical Grand Rounds, Philadelphia, Pennsylvania
- 2001 "Innovative Clinical and Translational Research in Thoracic Surgery" Brigham and Women's Hospital Surgical Grand Rounds, Boston, MA
- 2001 "Translational Research for Lung Cancer, Pulmonary Fungal Infections and Respiratory Failure" Thomas Jefferson University Hospital Surgical Grand Rounds, Philadelphia, PA
- 2001 "Surveillance and Treatment of Recurrence after Lung Cancer Resection" Post Graduate Course in Thoracic Surgery, American College of Surgeons Annual Meeting, New Orleans, LA
- 2002 "Treatment of Mesothelioma" Chester County Hospital Oncology Grand Rounds, West Chester, PA
- 2002 "The Treatment of Advanced Lung Cancer" Lankenau Hospital Oncology Grand Rounds, Wynnewood, PA
- 2002 "Of Fungus, Photons and Cancer" First Annual Naomi Fisher Memorial Lecture, Philadelphia College of Medicine, Philadelphia, PA
- 2003 "Photodynamic Therapy in the Treatment of Lung Cancer" Thomas Jefferson University Hospital, Kimmel Cancer Center – 2003 Lung Cancer Symposium, Philadelphia, PA
- 2003 "PDT for Pleural Malignancies" 31st Meeting of the American Society of Photobiology, Baltimore, MD
- 2003 "Clinical and Translation Research in Thoracic Oncology" Mercy Fitzgerald Hospital Grand Rounds, Philadelphia, PA
- 2003 "Nuances of Chest Tube Management in Thoracic Surgery" The 2003 Dutch Thoracic Society Meeting, Enschede, The Netherlands
- 2003 "Photodynamic Therapy for Pleural Malignancies" Oncology Grand Rounds, Enschede Medical Center, Enschede, The Netherlands



- 2004 “Photodynamic Therapy for Lung Cancer with Pleural Dissemination” American College of Surgeons Meeting – Puerto Rican Chapter, San Juan, Puerto Rico
- 2004 “Translational Research in Thoracic Surgery” American College of Surgeons Meeting – Puerto Rican Chapter, San Juan, Puerto Rico
- 2004 “Safe Performance of Thoracoscopic Procedures” 2004 Meeting of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), Denver, CO
- 2004 “Photodynamic Therapy for Lung Cancer: From Mundane to Madness.” Lehigh Valley Medical Center Surgical Grand Rounds, Allentown, PA
- 2005 “Photodynamic and Other Emerging Therapies for Mesothelioma and NSCLC with Pleural Involvement” University of Pennsylvania Current Management of Resectable Lung and Pleural Malignancies Conference, Philadelphia, PA
- 2005 “Practical and Technical Aspects of Chest Tube Placement” Philadelphia CT Fellow Association, Philadelphia, PA
- 2005 “Of Pigs, Hypoxia and Perfluorocarbons: Using the Abdomen Like an ‘Artificial Lung.’” The Massachusetts General Hospital Surgical Society Meeting, Boston, MA
- 2005 “Photodynamic Therapy for Lung Cancer: Stage IA to IIIB” Frankford Hospital – Cancer Center Grand Rounds, Philadelphia, PA
- 2005 “Photodynamic Therapy (PDT) for Mesothelioma” 16<sup>th</sup> World Congress of the International Society for Laser Surgery and Medicine, Tokyo, Japan
- 2005 “Novel Applications of Photodynamic Therapy (PDT) for Lung Cancer – Present and Future.” 16<sup>th</sup> World Congress of the International Society for Laser Surgery and Medicine, Tokyo, Japan
- 2005 “Surgery Following Neoadjuvant Chemotherapy and Radiation Therapy.” American Society for Therapeutic Radiation and Oncology (ASTRO) Annual Meeting, Denver, CO
- 2005 “Innovations in Thoracic Surgery.” Symposium on General Thoracic Surgery. American Association of Thoracic Surgery Annual Meeting. Philadelphia, PA
- 2005 “Photodynamic Therapy for Pleural Cancers” University of Taiwan Medical Center, Taipei, Taiwan

- 2005 “Photodynamic Therapy for Lung Cancer” Taiwan Photodynamic Therapy Society, Taipei, Taiwan
- 2005 “PDT and Other Emerging Therapies for NSCLC with Pleural Involvement and Mesothelioma” The Cooper Health System Thoracic Oncology Grand Rounds, Camden, NJ
- 2006 “Treatment of Pleural Malignancies” University of Pennsylvania Current Management of Resectable Lung and Pleural Malignancies Conference, Philadelphia, PA
- 2006 “Photodynamic Therapy for Pleural Malignancies” Roswell Park Cancer Center, Buffalo, NY
- 2006 “Surgical Treatment of Mesothelioma, Taiwan Thoracic Surgical Society, Taipei, Taiwan
- 2006 “The Potential for Rare Earth Phosphors as an Internal Light Source for Photodynamic Therapy” New Jersey Nanotechnology Consortium 2006 Meeting, Princeton, NJ
- 2006 “Nanotechnology, Rare Earth and Light – Innovative Approaches to Expand the Applications of Photodynamic Therapy to Treat Cancer” Texas Nanotechnology Initiative 2006 Meeting, Dallas, Texas
- 2006 “Management of Mesothelioma” Pennsylvania Association for Thoracic Surgery, 44<sup>th</sup> Annual Meeting, Allentown, PA
- 2007 “PDT for Mesothelioma: Past, Present and Future.” International Mesothelioma Program, Grand Rounds, Brigham and Women’s Hospital, Boston, MA
- 2007 “Photodynamic Therapy for Mesothelioma: Past, Present and Future.” Yale Cancer Center Grand Rounds, John Murren Memorial Lectureship, Yale–New Haven Hospital, New Haven, CT
- 2008 “Lung: Light and New Treatments for Old Cancers.” Pulmonary Medicine Grand Rounds, Hospital of the University of Pennsylvania, Philadelphia, PA
- 2008 “Surgical Treatment of Mesothelioma.” University of Pennsylvania Current Management of Resectable Lung and Pleural Malignancies Conference, Philadelphia, PA

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- 2008 “Photodynamic Therapy for Pleural Malignancies: The Penn Experience and Future Directions.” Taiwan Photodynamic Therapy Program Research Conference, University of Taiwan Medical Center, Taipei, Taiwan
- 2008 “PDT for Malignancies Involving the Pleura.” The Eli Glatstein, MD Translational Research Conference: New Paradigms in Radiation Oncology, Philadelphia, PA
- 2008 “Novel Therapies for Mesothelioma: Photodynamic Therapy.” Harvard Medical School & the American Association for Thoracic Surgery Course: “Surgery-based Multimodality Therapy for Malignant Pleural Mesothelioma,” Dallas, TX
- 2008 “Challenging Lung Cancer Cases.” American Society for Therapeutic Radiation and Oncology (ASTRO) 50<sup>th</sup> Annual Meeting, Boston, MA
- 2008 “Giraffes and Other Ventilatory Challenges.” The Science of Thoracic Surgery, Harvard Medical School, Boston, MA
- 2008 “Staging Laparoscopy and Bronchoscopy Alters Management for Patients with Pleural Mesothelioma.” 21<sup>st</sup> Annual Meeting of the General Thoracic Club, San Diego, CA
- 2009 “Treatment of Malignant Pleural Effusion.” Life After Breast Cancer 17<sup>th</sup> Conference for Patients and Families, Abramson Cancer Center, Penn Medicine, Philadelphia, PA
- 2009 “Treatment of Mesothelioma.” Focus on Lung Cancer Conference for Patients and Families, Abramson Cancer Center, Penn Medicine
- 2009 “Minimally Invasive Thoracic Surgery.” 59<sup>th</sup> Annual Meeting of the American College of Surgeons Puerto Rico Chapter, San Juan, PR
- 2009 “Management of Malignant Pleural Effusions.” The STS/ACCP Winter Thoracic Diseases Meeting: “Eliminating Borders: Multidisciplinary Evaluation of Pulmonary/Thoracic Issues,” Lake Tahoe, CA
- 2009 “Photodynamic Therapy for Mesothelioma and Other Pleural Malignancies: Past, Present and Future.” Pocono Medical Center Grand Rounds, Stroudsburg, PA
- 2009 “Treatment of Pleural Cancers.” Cancer Treatment Centers of America Grand Rounds, Philadelphia, PA

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- 2009 “New Horizons in the Biology and Treatment of Lung Cancer.” Annual Meeting of the American Society of Clinical Oncology, Orlando, FL
- 2009 “Photodynamic Therapy and the Treatment of Pleural Malignancies.” Middle Atlantic Regional Interventional Pulmonology Consortium, Philadelphia, PA
- 2009 “Challenging Lung Cancer Cases.” American Society for Therapeutic Radiation and Oncology (ASTRO) 51<sup>st</sup> Annual Meeting, Chicago, IL
- 2010 “Photodynamic Therapy for Pleural Mesothelioma.” International Symposium on Malignant Mesothelioma, Washington, DC
- 2010 “A Technique for Accessing the Fused Pleural Space for Gene Therapy or Other Intrapleural Treatments for Mesothelioma.” International Mesothelioma Interest Group, Kyoto, Japan
- 2010 “A Standardized Technique of Radical Pleurectomy for Mesothelioma that Achieves a Macroscopic Complete Resection, Regardless of Tumor Bulk.” The 10<sup>th</sup> International Conference of International Mesothelioma Interest Group, Kyoto, Japan
- 2010 “Successfully Treated Stage III Myxomatous Epithelial Mesothelioma Presenting with a Recurrent Three Liter Mucinous Pleural Effusion.” Challenging Case Presentation, The 10<sup>th</sup> International Conference of International Mesothelioma Interest Group, Kyoto, Japan
- 2010 “Innovative Surgical Treatments: Pleural Mesothelioma.” Abramson Cancer Center Focus on Mesothelioma Conference. Philadelphia, PA
- 2010 “Surgical Treatment of Pleural Mesothelioma.” American Society for Therapeutic Radiation and Oncology (ASTRO) Multidisciplinary Symposium in Thoracic Oncology, Chicago, IL
- 2010 “Challenging Lung Cancer Cases.” American Society for Therapeutic Radiation and Oncology (ASTRO) 52<sup>nd</sup> Annual Meeting, San Diego, CA
- 2010 “Malignant Pleural Mesothelioma: Is There Any Progress, Is There Any Hope?” Pocono Medical Cancer Center Grand Rounds, East Stroudsburg, PA
- 2010 Invited Discussant – International NOTES Summit – Natural Orifice Surgery Consortium for Assessment and Research, Chicago, IL

- 2010 Invited Discussant – American College of Surgeons 96<sup>th</sup> Annual Clinical Congress. Washington, DC
- 2011 “Thoracoscopic Management of Postoperative Chylothorax.” Annual Meeting of the Society of Advanced Gastrointestinal and Endoscopic Surgeons (SAGES), San Antonio, TX
- 2011 “Pleural Mesothelioma: Of Lungs, Lasers and Lymphocytes.” Eastern Surgical Society Annual Meeting, Philadelphia, PA
- 2011 “Innovative Therapies for Pleural Mesothelioma: The Problem, The Person, The Plan.” American Thoracic Society 2011 Postgraduate Course, Denver, CO
- 2011 “Radical Pleurectomy and Photodynamic Therapy for Stage IVa Thymic Malignancies.” International Thymic Malignancy Interest Group Conference, Amsterdam, Netherlands
- 2011 “The Role of Surgery in the Treatment of Pleural Mesothelioma.” Focus on Mesothelioma Conference, Philadelphia, PA
- 2012 “Photodynamic Therapy in the Treatment of Pleural Malignancies.” James Cancer Center Symposium. The Ohio State University. Columbus, OH
- 2012 Invited Discussant – Issues in Thoracic Surgery Session, American Thoracic Society, 2012 International Conference, San Francisco, CA
- 2012 “Future Directions in Thoracic Surgery.” Cancer Research United Kingdom Lung Cancer Symposium, Manchester, United Kingdom
- 2012 “Surgical Treatment for Mesothelioma and Other Pleural Cancers.” Visiting Professor, University of Utah Huntsman Cancer Institute, Salt Lake City, UT
- 2012 “Lung Sparing Surgery for Malignant Pleural Mesothelioma.” 2012 Multidisciplinary Symposium in Thoracic Oncology, Chicago, IL
- 2012 “Surgery-based Clinical Trials in Malignant Pleural Mesothelioma.” 11<sup>th</sup> International Conference of the International Mesothelioma Interest Group, Boston, MA
- 2012 “Surgery for Pleural Tumors.” Eastern Cardiothoracic Surgical Society Annual Meeting, Naples, FL
- 2012 “Photodynamic Therapy as a Intraoperative Adjuvant Treatment for Malignant Pleural Mesothelioma.” 11<sup>th</sup> International Conference of the International Mesothelioma Interest Group, Boston, MA

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- 2012 “Radical Pleurectomy and Intraoperative Porfirmer Photodynamic Therapy for Malignant Pleural Mesothelioma.” 11<sup>th</sup> International Conference of the International Mesothelioma Interest Group, Boston, MA
- 2013 “Promotion of interaction between clinicians and researchers to achieve the best possible outcomes for patients with mesothelioma.” Mesothelioma Applied Research Foundation 2013 Symposium, Las Vegas, NV
- 2013 “Radical Pleurectomy in the Treatment of Malignant Pleural Mesothelioma.” 3<sup>rd</sup> International Symposium on Lung-Sparing Therapies for Malignant Pleural Mesothelioma, Santa Monica, CA
- 2013 Invited Discussant – Sub-lobar Resection is Equivalent to Lobectomy for Clinical Stage 1a Lung Cancer: An Analysis of I-ELCAP Resected Cancer. American Association for Thoracic Surgery 93<sup>rd</sup> Annual Meeting, Minneapolis, MN
- 2013 “Posterior intercostal lymph nodes and malignant pleural mesothelioma – impact on survival.” International Association for the Study of Lung Cancer (IASLC), 15<sup>th</sup> World Conference on Lung Cancer, Sydney Australia
- 2013 “The impact of macroscopic complete resection radical pleurectomy for mesothelioma on pulmonary function.” International Association for the Study of Lung Cancer (IASLC), 15<sup>th</sup> World Conference on Lung Cancer, Sydney Australia
- 2013 “16-year experience of routine laparoscopic and selective contralateral thoracoscopic staging for malignant pleural mesothelioma.” International Association for the Study of Lung Cancer (IASLC), 15<sup>th</sup> World Conference on Lung Cancer, Sydney Australia
- 2013 “Adjuvant Intracavitary Treatments in Mesothelioma.” International Association for the Study of Lung Cancer (IASLC), 15<sup>th</sup> World Conference on Lung Cancer, Sydney Australia, October 2013
- 2014 Key Note Lecture – “Radical Pleurectomy and Photodynamic Therapy for the Treatment of Malignant Pleural Mesothelioma.” 31<sup>st</sup> German Cancer Conference, Berlin, Germany
- 2014 “Building a Successful Mesothelioma Program.” The Mesothelioma Applied research Foundation - International Symposium on Malignant Mesothelioma. Alexandria, Virginia, March 2014
- 2014 Invited Discussant. American Association for Thoracic Surgery (AATS) 94<sup>th</sup> Annual Meeting, Toronto, Canada

- 2014 “A New Hybrid Technique For Performing Tracheostomy In The Super Obese Patient.” American Association for Thoracic Surgery (AATS) 94<sup>th</sup> Annual Meeting, Toronto, Canada
- 2014 Panel Discussion on Treatment for Malignant Pleural Mesothelioma. 27<sup>th</sup> Annual Meeting of the General Thoracic Surgery Club. Litchfield Park, Arizona
- 2014 “Evidence Suggesting a Positive Immunostimulatory Effect of Photodynamic Therapy in the Treatment of Malignant Pleural Mesothelioma.” American Society of Photobiology – 37<sup>th</sup> Annual Meeting, San Diego, CA
- 2014 Keynote Presentation. “Surgery, Surgeons and Science – Treating Malignant Pleural Mesothelioma in 2014.” 1<sup>st</sup> Mesothelioma Research Symposium, University of Glasgow, Glasgow, Scotland
- 2014 Keynote Presentation. “Surgery with Curative Intent for Malignant Pleural Mesothelioma.” 5<sup>th</sup> Japanese Mesothelioma Interest Group Meeting, Kyoto, Japan
- 2014 Visiting Professor Lecture – “Extended Pleurectomy-Decortication and Photodynamic Therapy for Malignant Pleural Mesothelioma.” Hyogo College of Medicine, Kyoto, Japan
- 2014 “State of the Art Technique for Lung-Sparing Surgery for Malignant Pleural Mesothelioma.” 12<sup>th</sup> International Conference of the Mesothelioma Interest Group, Cape Town, South Africa
- 2015 “Surgery as a local therapy for Mesothelioma” 2015 International Symposium on Malignant Mesothelioma, National Cancer Institute, Bethesda, Maryland
- 2015 “Surgery for Malignant Pleural Mesothelioma” – Mozart or Metallica?” Pulmonary and Critical Care Grand Rounds, University of Maryland Medical Center, Baltimore, Maryland
- 2015 “Surgery for Malignant Pleural Mesothelioma” – Mozart or Metallica?” Anesthesia Grand Rounds, University of Maryland Medical Center, Baltimore, Maryland
- 2015 “Surgery for Malignant Pleural Mesothelioma” – Mozart or Metallica?” Surgery Grand Rounds, University of Maryland Medical Center, Baltimore, Maryland

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- 2015 “SBRT with protons or photons vs Surgery in Operative Early Stage NSCLC - has the time come for non-surgical approaches?” SCCA Proton Therapy Thoracic Focus Group, Seattle, Washington
- 2015 “Grand Rounds: Difficult Mesothelioma Cases” 16<sup>th</sup> IASLC World Conference on Lung Cancer, Denver, CO
- 2015 Program Moderator, Surgical Video Session, 95<sup>th</sup> AATS Annual Meeting, Seattle, Washington
- 2016 “Surgery for Malignant Pleural Mesothelioma” – Mozart or Metallica?” Diagnostic Radiology and Nuclear Medicine Grand Rounds, University of Maryland Medical Center, Baltimore, Maryland
- 2016 “Surgery for Malignant Pleural Mesothelioma” – Mozart or Metallica?” Grand Rounds, Shady Grove Medical Center, Rockville, Maryland
- 2016 “Surgery for Malignant Pleural Mesothelioma” – Mozart or Metallica?” Grand Rounds, Prince Georges’ Hospital Center, Lanham, Maryland
- 2016 “Surgery for Malignant Pleural Mesothelioma” – Mozart or Metallica?” Grand Rounds, Holy Cross Hospital, Silver Spring, Maryland
- 2016 Presenting Author - “A novel System for Identifying Pulmonary Air Leaks with an Inhaled Marker” 96<sup>th</sup> AATS Annual Meeting, Baltimore, Maryland

**Organizing Roles in Scientific Meetings:**

- 2009 Course Director. Focus on Mesothelioma Symposium. Abramson Cancer Center, Philadelphia, PA
- 2010 Course Director. Focus on Mesothelioma Symposium. Abramson Cancer Center, Philadelphia, PA
- 2011 Course Director. Focus on Mesothelioma Symposium. Abramson Cancer Center, Philadelphia, PA
- 2012 Course Director. Focus on Mesothelioma Symposium. Abramson Cancer Center, Philadelphia, PA
- 2013 Course Director. Focus on Mesothelioma Symposium. Abramson Cancer Center, Philadelphia, PA
- 2013 Course Director, Inaugural Penn Mesothelioma and Pleural Program CME Conference on the Diagnosis, Treatment and Research of Malignant Pleural Mesothelioma, Philadelphia, PA
- 2014 Course Director, Focus on Mesothelioma Symposium. Abramson Cancer Center, Philadelphia, PA
- 2014 Course Director, Translational Research for Mesothelioma Conference, Abramson Cancer Center, Philadelphia, PA
- 2015 Course Director, Thoracic Oncology, CME Conference, University of Maryland Medical Center, Baltimore, MD



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53. **Friedberg JS**, Culligan M, Putt M, French B, Hahn S, Simone CB, Stevenson J, Alley E, Sterman D, EJ Wang, Cengel K. Posterior intercostal lymph nodes and malignant pleural mesothelioma – what are they, where are they and what do they mean? Poster presentation at the 11<sup>th</sup> International Conference of International Mesothelioma Interest Group, Boston, MA, September 2012.
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  58. **Friedberg JS**, Albelda S, Haas A, Metzger S, Culligan M, Sterman D. A New Minimally Invasive Surgical Technique to Access a Fused Pleural Space for Biopsy, Gene Therapy or Other Novel Intrapleural Therapies – A Report of 34 patients. Poster presentation at the 15<sup>th</sup> World Conference on Lung Cancer, Sydney Australia, October 2013.
  59. **Friedberg JS**, Haas A, Culligan M, Sterman D. A Novel Technique for Palliating Recurrent Pleural Effusions with a Port-Accessed Tunneled Catheter. Poster presentation at the 15<sup>th</sup> World Conference on Lung Cancer, Sydney Australia, October 2013.
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62. **Friedberg, JS**, Culligan M, Katz S, et al. Comparison of Three Radiographic Tumor Volume Estimation Techniques for Malignant Pleural mesothelioma: Their Correlation with Each Other, Actual Measures Intraoperative Tumor Volumes and Survival. 15<sup>th</sup> World Conference on Lung Cancer, Sydney Australia, October 2013.
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64. Culligan M, Metzger S, Sterman D, **Friedberg JS**. A Dedicated Multidisciplinary Program Fosters Enrollment into Clinical Trials for Malignant Pleural mesothelioma Patients. Poster presentation at 2014 Oncology Nurse Society Congress, Anaheim, CA. May 1-4, 2014.
65. Barsky AR, Buckley JP, **Friedberg JS**, Culligan M, et al. Prophylactic Irradiation of Surgical Tract Sites in the Era of Radical Pleurectomy for Malignant Pleural Mesothelioma. Abstract submission – American Society for Radiation Oncology” 56<sup>th</sup> Annual Meeting, Moscone Center, San Francisco, September 2014.
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67. Barsky AR, Buckley JP, **Friedberg JS**, Culligan M, Simone C, et al. Radiation-induced Malignant Mesothelioma: Frequency and Prognosis. Abstract submission – American Society for Radiation Oncology” 56<sup>th</sup> Annual Meeting, Moscone Center, San Francisco, September 2014.
68. **Friedberg JS**, Tenuto ME, Finlay JC, Darafsheh A, Paik T, Chacko AM, Pryma D, Mikitsh J, Murray CB. Ultra low (microwatt) intensity light can be used to kill malignant pleural mesothelioma cells with photodynamic therapy. Submitted for American Society of Photobiology meeting, San Diego, CA, June 2014.
69. **Friedberg JS**, Culligan M, Putt M, Barsky A, French B, Hahn SM, Alley E, Sterman D, Cengel KA, Simone CB II. Posterior Intercostal Lymph Nodes and Malignant Pleural Mesothelioma – What Are They, Where Are They and What Do They Mean? 12th International Conference of the Mesothelioma Interest Group, Cape Town, South Africa, October 2014.
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72. **Friedberg JS**, Grillo, H, Culligan M. Effects on air leak and chest tube management with the use of a lung sealant at the time of radical pleurectomy for malignant pleural

- mesothelioma. Poster presentation at the 12th International Conference of the Mesothelioma Interest Group, Cape Town, South Africa, October 2014.
73. Barsky A, **Friedberg JS**, Culligan M, Sterman D, Alley E, Lanfranco A, Litzky L, Glatstein E, Hahn S, Cengel K, Simone C. Frequency and Prognosis of Radiation-induced Malignant Pleural Mesothelioma. Poster presentation at the 12th International Conference of the Mesothelioma Interest Group, Cape Town, South Africa, October 2014.
74. **Friedberg JS**, Naselsky W, Tenuto M, Finlay J, Culligan M, Busch T. Hyperthermia is not effective and does not augment photodynamic therapy in a murine mesothelioma model. Poster presentation at the 12th International Conference of the Mesothelioma Interest Group, Cape Town, South Africa, October 2014.
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77. **Friedberg JS**, Tenuto M, Finlay J, Darafsheh A, Paik T, Najmr S, Murray C. Phosphor-based fiber optic microprobes for ionizing beam radiation dosimetry. SPIE Photonic West 2015, San Francisco, CA, February 2015.
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### **Book Chapters:**

1. **Friedberg JS**, Kaiser LR: The role of video-assisted thoracic surgery management of pulmonary cancer and tumors of the mediastinum. Chapter 7 in Geraghty JG, Young HL, Sackier JM, Stoldt HS, Audisio RA (eds): *Minimal Access Surgery in Oncology*. London: Greenwich Medical Media, 1998, 83-98.
2. **Friedberg JS**, Lanuti M: The esophagus. Chap. 12 in Kreisel K, Krupnick AS, Kaiser LR (eds.): *The Surgical Review: An Integrated Basic and Clinical Science Study Guide*. Philadelphia: Lippincott Williams & Wilkins, 2001, 185-196.
3. **Friedberg JS**, Deeb M: Treatment of esophageal perforation. In Baker RJ (ed.): *Mastery of Surgery, Fourth Edition*. Philadelphia: Lippincott Williams & Wilkins, 2001, 843-853.
4. **Friedberg JS**: The pleura: Anatomy, physiology and disorders. In Norton JA, Bollinger RR, Chang AE, Lowry SF, Mulvihill SJ, Pass HI, Thompson RW, Li M (eds.): *Essential Practice of Surgery*. New York: Springer Verlag, 2003, 1243-1264.
5. Rodriguez E, Park P, Cowan S, Weinstein M, Kaulback K, **Friedberg JS**, Diehl JT, Mannion JD, Cohen M: Complicated management of a traumatic aorto-esophageal fistula in a patient with a right-sided aortic arch. [Case Report] *Journal of Trauma* 56(3):691-693, Mar 2004.
6. **Friedberg JS**, Hahn S: Foscan-mediated photodynamic therapy and operation for malignant pleural mesothelioma. [Editorial] *Ann Thorac Surg* 78:388-389, June 2004.

7. Awsare M, Coben R, **Friedberg JS**, Primary melanoma of the esophagus. [Case Report] *Clinical Gastroenterology & Hepatology* 3(7):xxvii, July 2005.
8. **Friedberg JS**, Cohn H, Rodriguez E: Secondary lung tumors. In Selke F, Swanson S., del Nido PJ (eds.): *Sabiston & Spencer's Surgery of the Chest, 7<sup>th</sup> Edition*. Philadelphia: Elsevier Science 1(23):337-354, 2005.
9. **Friedberg JS**, Rodriguez E, Baas P: Photodynamic therapy for pleural mesothelioma. Part 8, Chap. 45 in Pass HI, Vogelzang N, Carbone M (eds.): *Malignant Mesothelioma: Advances in Pathogenesis, Diagnosis, and Translational Therapies*. New York: Springer-Verlag, 2005, 667-677.
10. **Friedberg JS**: Malignant pleural and pericardial effusions. Chap. 56 in Pass HI, Carbone DP, Johnson DH, Minna JD, Turrisi AT III (eds.): *Lung Cancer: Principles and Practice, Third Edition*. Philadelphia: Lippincott, Williams & Wilkins, 2005, 794-804.
11. **Friedberg JS**, Carr S: Malignant effusions. Chap. 86 in *Oncology: An Evidence-Based Approach*. New York: Springer-Verlag, Inc., 2006, 1518-1525.
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13. **Friedberg JS**, Carr S: Surgical management of malignant mesothelioma. Chap. 32 in Kaiser LR, Kron IL, Spray TS (eds.): *Mastery of Cardiothoracic Surgery, 2<sup>nd</sup> Edition*. Baltimore: Lippincott Williams & Wilkins, 2006, 262-270.
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15. Mayhew PD, **Friedberg JS**, Video-assisted thoracoscopic resection of noninvasive thymomas using one-lung ventilation in two dogs, [Case Report] *Veterinary Surgery* 37(8):756-762, Dec. 2008.
16. Berry MF, **Friedberg JS**: Overview of cancer of the upper airways. Chap. 51 in Sugarbaker D, Bueno R, Krasna M, Mentzer S, Zellos L (eds.): *Adult Chest Surgery*. New York: McGraw-Hill Professional, 2009, 430-437.
17. Berry MF, **Friedberg JS**: Techniques of tracheal resection. *Adult Chest Surgery*. Chap. 54 in Sugarbaker D, Bueno R, Krasna M, Mentzer S, Zellos L (eds.): *Adult Chest Surgery*. New York: McGraw-Hill Professional, 2009, 458-464.
18. **Friedberg JS**: Segmentectomy. Chap. 65 in Sugarbaker D, Bueno R, Krasna M, Mentzer S, Zellos L (eds.): *Adult Chest Surgery*. New York: McGraw-Hill Professional, 2009, 561-566.
19. **Friedberg JS**: Photodynamic therapy in the management of pleural effusions. Chap. 105 in Sugarbaker D, Bueno R, Krasna M, Mentzer S, Zellos L (eds.): *Adult Chest Surgery*. New York: McGraw-Hill Professional, 2009, 891-899.
20. Cowan S, Culligan MJ, **Friedberg JS**: Secondary lung tumors. Chap. 23 in Selke F, Swanson S, del Nido PJ (eds.): *Sabiston & Spencer's Surgery of the Chest, 8<sup>th</sup> Edition*. Philadelphia: Elsevier Science, 2010, 337-350.
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26. **Friedberg JS, Culligan M.** Principles of Other Therapeutic Modalities – Photodynamic Therapy in Thoracic Oncology. *Thoracic Oncology Textbook* – in press, 2014.
27. **Friedberg JS, Culligan M.** Photodynamic Therapy as an Intraoperative Treatment for Pleural Cancers. *World Scientific Book* – in press, 2014.
28. **Friedberg JS, Carr S.** Tracheostomy. *Shield's General Thoracic Surgery, 8<sup>th</sup> edition*. – in press March 2015.
29. **Friedberg JS, Carr S.** Lung-Sparing Surgery for Malignant Pleural Mesothelioma. *Sabiston and Spencer of the Chest, 9<sup>th</sup> ed.* – in press 2015.
30. **Friedberg JS, Culligan M, Carr S.** Results After Intraoperative Therapy in Malignant Pleural Mesothelioma. *Bentham Scientific eBook*. – in press, 2015.

#### **Alternative Media:**

1. **Friedberg JS, Pechet TV:** Video mediastinoscopy and surgical advances for treating lung cancer. *Live WebCast, Thomas Jefferson University Hospital, Philadelphia, PA, 2002.*
2. **Friedberg JS:** Surgical treatment of lung cancer and photodynamic therapy in the treatment of advanced lung cancer. *Rowan University Radio Station "Your Health Matters,"* Oct. 2004.
3. **Friedberg JS, Hahn SM:** International photodynamic therapy program. *Comcast Newsmakers / CN8 Television, Jan. 2007.*
4. **Friedberg JS:** Photodynamic therapy for advanced lung cancer. *CNN Headline News* Feb. 2007.
5. **Friedberg JS:** Photodynamic therapy treatment of a patient with mesothelioma. Featured in *Discovery Channel Series: Notes from the Edge of Life*, filmed 2007.
6. **Friedberg JS:** Pleural Disease, Decision Support in Medicine, LLC. Robert Kotloff, Editor, 2012.
7. **Friedberg JS, Cowan S:** Mediastinal Masses, Decision Support in Medicine, LLC. Barry Fuchs, Editor, 2012.
8. **Friedberg JS.** New Frontiers in Surgery for Mesothelioma. Teleconference – Mesothelioma Applied Research Foundation. January 2014.

#### **Patents:**

1. **Friedberg JS:** Device for preventing gastroesophageal reflux. US Patent Ref. No. 61/026,598, February 6, 2008.
2. **Friedberg JS, Carr S:** System oxygenation via gastric perfusion with perfluorocarbon (PFC). US Patent No. 11/333,805, January 17, 2006.
3. **Friedberg JS:** Apparatus and methods for facilitating access to vessels. US Patent Ref. No. 61/026,603, February 6, 2009.
4. **Friedberg JS:** Natural orifice transluminal endoscopic surgery overtube and method of introducing multiple endoscopes. US Patent Ref. No 60/896,094, September 18, 2009.
5. **Friedberg JS:** Photodynamic Therapy-Generated Mesothelioma Vaccine. US Patent Ref. No. 60/779,648. November 12, 2008.

6. Ju Y, **Friedberg JS**: Cell-uptake of water-soluble lanthanide ion doped upconversion nanoparticles (UCNP) for near infrared (NIR) cell imaging and photodynamic therapy. US Patent Ref. No. 61/032,000, February 27, 2008.
7. **Friedberg JS**, Bell H: Systems and methods for use of luminescent compounds in disease treatment and medical imaging. International Patent Ref. No. PCT/US2007/071717, June 21, 2007.
8. **Friedberg JS**: Radioisotope-Rare Earth Nanophosphor Mediated Photodynamic Therapy Cancer Treatment. US Patent Ref. No. 61/477,531, April 24, 2012
9. **Friedberg JS**, Fogt, F: Use of an antibody and a rare-earth based crystal for blood-typing. US Patent Ref. No. 13/129,090, November 12, 2008.
10. **Friedberg JS**: System and methods endotracheal intubation. US Patent Ref. No. 61/603,600, February 24, 2011.
11. **Friedberg JS**: System and method for detection and repair of pulmonary air leaks, US Patent Ref. No.11/738,106, April 20, 2007.
12. **Friedberg JS**: Apparatus and method for assisting carrying of objects by hand. US Patent Ref No. 14/072,285, November 2013.

#### **Additional Intellectual Property:**

Approximately one hundred additional invention disclosures have been submitted to the University of Pennsylvania Center for Technology Transfer and are available upon request.

#### **Research Funding**

##### ***Current funding:***

2008 – 2013	PO1 CA-087971-06A1, NIH-CA [NCI], Principal Investigator for Project 1 - Photodynamic Therapy for Pleural Malignancies. \$131,658/yr (5 year renewal scored high enough to pass for review by Dr. Harold Varmus, NCI Director)
2013 - present	Dr. and Mrs. James Brock Endowment for Mesothelioma Research \$1,000,000 lump sum donation to Penn Mesothelioma and Pleural Program, Program Director
2013 – present	Recipient of Penn Presbyterian Medical Center Fund Raiser with matching funds from Shein Foundation for Humanity, Development of Patient Education Materials for the Penn Mesothelioma and Pleural Program, Program Director, \$50,000 with matching funds (\$100,000)
2012 – 2017	Cuthbert Cancer Foundation donation for mesothelioma research and patient care, Co-PI with Dr. Stephen Hahn, initial gift of \$50,000/year for five years (\$250,000)
2012	Daniel Sullivan Fund, Donation for scholarly activities related to pleural malignancies, sole recipient, \$343,000 lump sum donation

2011 - 2014 Shein Foundation for Humanity, Donation for scholarly activities related to malignant pleural mesothelioma, sole recipient, \$167, 000.00/year for three years

2010 – 2013 Simon’s Foundation for Mesothelioma, Donation for establishment and development of the Penn Mesothelioma and Pleural Program, Program Director, \$250,000/year for three years (\$750,000)

***Past funding***

2010 BACH Fund Award, Principal Investigator, Use of Upconverting Nanophosphors for Diagnosis of Malignant Pleural Effusions, \$10,000

2008 – 2011 Sunstones BioScience Sponsored Research Agreement, Principal Investigator, Bio-application & Validation of Nanophosphor Compounds \$200,000/year for three years (\$600,000)

2008 – 2009 NIH STTR – Phase I Small Business Technology Transfer Grant, Principal Investigator, RBC typing antibodies labeled with rare earth phosphor upconverting nanoparticles, \$260,000

2008 – 2011 Nanotechnology Institute (NTI) of Pennsylvania Sponsored Research Grant, Principal Investigator, Bioapplications of rare earth nanophosphors \$50,000/year for three years (\$150,000)

2007 BACH Fund Award, Principal Investigator, Preoperative Teaching Tools Will Have a Positive Impact on Patients’ Thoracic Surgical Experience at Penn-Presbyterian Medical Center, \$9,400

2006 Abramson Cancer Center Lung Cancer Research Grant, Principal Investigator, Utilizing Photodynamic Therapy to Generate Anti-Tumor Vaccines in an Immunocompetent Murine Non-Small Cell Lung Cancer Model, \$25,000

2006 SAGES Research Grant, Principal investigator, Supplemental Oxygenation Utilizing Minimally Invasive Techniques of Peritoneal and Gastric perfusion with Oxygenated Perfluorocarbons, \$14,866

2006 BACH Fund Award, Photodynamic Therapy as a Treatment for Bronchoalveolar Carcinoma, Principal investigator, \$15,000

2006 Donald Perry Foundations for Cancer Research, For scholarly pursuits related to cancer research, sole recipient, \$77,257

2005 – 2008 AVAX Technologies, Inc, Sponsored Research Agreement, Principal Investigator, L-VAX: A Feasibility Study using a DNP-Modified Autologous Tumor Cell Vaccine as Therapy in Patients with Stage I or II Non-small Cell Lung Cancer, \$100,000



- 2005 BACH Fund Award, Principal Investigator, Autologous Tumor Vaccine Production for NSCLC, \$4,500
- 2004 – 2007 Sponsored Research Agreement, Eli Lilly and Company, Principal Investigator, A Multicenter Phase II Trial of Neo-Adjuvant ALIMTA plus Cisplatin Followed by Surgery and Radiation for Pleural Mesothelioma, \$50,000
- 2003 Gifted approximately \$500,000 worth of neat perfluorocarbon by Dr. Jewel Osterholm of Neuron Therapeutics for nonpulmonary supplemental oxygenation research, recipient and principal investigator
- 2002 American Society of Lasers in Medicine and Surgery. Summer research grant: In vitro dose rate response of Photofrin for *Aspergillus fumigatus*. Award winner – Josh Collins. PI – Joseph S. Friedberg, MD, \$2,000
- 1996 Thomas B. and Jeannette E. Laws McCabe Fund Fellow and Pilot Award. Photodynamic Therapy for cancer, Principal Investigator, \$50,000.