

## **CURRICULUM VITAE**

### **PRÉCIS:**

Name: Evan Charles Unger, M.D., F.A.C.R.  
Title: Professor of Radiology and Biomedical Engineering  
Company: University of Arizona Health Sciences Center  
Telephone: 520-977-1210  
Home Address: 6227 E. Miramar Drive  
Tucson, AZ 85715  
Date of Birth: June 15, 1954  
Place of Birth: Sacramento, CA  
Marital Status: Married 1980 (Susan), four children

### **EMPLOYMENT:**

7-1-1986 to 6-29-1988 Chief, Magnetic Resonance Imaging  
Fox Chase Cancer Center  
7701 Burholme Avenue  
Philadelphia, PA 19111

7-1-1988 to 6-30-1994 Director, Magnetic Resonance Imaging and Computed Tomography  
Department of Radiology  
The University of Arizona  
Tucson, AZ 85724

7-1-1990 to 10-30-1999 Founder, Chairman, President and Chief Executive Officer  
ImaRx Pharmaceutical Corp.  
Raised over \$65 million in grants, milestone payments and sale of Company  
Developed three drugs approved by FDA; Definity® is currently #1 selling ultrasound contrast agent in U.S.  
Sold ImaRx Pharmaceutical to DuPont Pharma in October of 1999 at a profit (>20x ROI)

7-1-1994 to 6-30-1999 Director, Cross-sectional Imaging  
Department of Radiology  
The University of Arizona  
Tucson, AZ 85724

7-1-1990 to 6-30-1999 Director, Body Imaging Fellowship Training Program  
Department of Radiology  
The University of Arizona  
Tucson, AZ 85724

7-1-1999 to 9-15-2005 Professor of Radiology and Biomedical Engineering  
Department of Radiology  
The University of Arizona  
Tucson, AZ 85724

10-31-1999 to 1-5-2000 Chairman, President and Chief Executive Officer  
ImaRx LLC; rolled intellectual property into successor company, ImaRx Therapeutics

1-6-2000 to 10-19-2006 President and Chief Executive Officer  
Director, Board of Directors

ImaRx Therapeutics, Inc.

Raised more than \$50 million in grants and investment capital.

Designed protocols and filed INDs to conduct clinical trials in microbubble-enhanced sonothrombolysis of thrombosed dialysis grafts, peripheral artery occlusions and stroke. Completed feasibility trial in dialysis grafts; commenced multi-center international trial in stroke.

6-1-2005 to 2014	Member Board of Directors Arizona Cancer Center
1-10-2007 to 2014	Scientific Advisory Board Focused Ultrasound Surgery Foundation
3-1-2008 to Present	Co-Leader Cancer Imaging Program, Arizona Cancer Center
10-20-2006 to 5-2007	Director of Scientific Advisory Board, ImaRx Therapeutics Director, Board of Directors ImaRx Therapeutics
2-1-2007 to Present	Professor of Radiology and Biomedical Engineering University of Arizona Health Sciences Center Tucson, AZ
6-1-2009 to 1-12-10	Interim Medical Director University Medical Imaging Turned Center from money losing to profitable.
7-1-2009 to 7-1-2011	Director Body Imaging University of Arizona
4-1-2008	Founder NuvOx Pharma, LLC. NuvOx is developing an oxygen therapeutic In-licensed 4 patents, filed 5 new patent applications. Obtained right of reference to regulatory documents, had pre-IND meeting, will commence clinical trials for oxygen therapeutic Q4 of 2013.
9-1-2009	Founder Microvascular Therapeutics, LLC. MVT is developing microbubble enhanced sonolysis for acute myocardial infarction and nanoparticle technology. MVT is currently supporting clinical trials for sonolysis treatment of acute MI in the Netherlands and Brazil.
7-2013	Member Sarver Heart Center

**EDUCATION:**

- 1977 B.A. Economics, University of California  
Berkeley, CA
- 1982 M.D. University of California at San Francisco School of Medicine  
San Francisco, CA

**INTERNSHIP:**

- 1982-1983 Department of Internal Medicine  
University of Colorado Affiliated Hospitals  
Denver, CO

**RESIDENCY:**

- 1983-1986 Mallinckrodt Institute of Radiology  
Washington University School of Medicine  
St. Louis, MO

**BOARD CERTIFICATION:**

- 1983 National Board of Medical Examiners  
1986 American Board of Radiology

**LICENSURE:**

- 1983 Missouri, License #R6D89 (2/1/84 to 1/31/87)  
1986 Pennsylvania, License # MD035470E (3/21/86 to 12/31/88)  
1988 Arizona, License # 17736  
2011 Nevada, License # 122121  
2011 California, License # 89009

**HONORS:**

- 1977 Departmental Honors in Economics, University of California, Berkeley  
1982 Alpha Omega Alpha, Medical School Honor Society  
1982 Woodland Memorial Scholarship  
1990 Summa Cum Laude Scientific Poster Session, Society for Magnetic Resonance Imaging  
1994 Listing in Who's Who of American Inventors  
1999 The 1999 Radiology Editor's Recognition Award for reviewing with Distinction  
2000 The 2000 Radiology Editor's Recognition Award for reviewing with Distinction  
2001 The 2001 Radiology Editor's Recognition Award for reviewing with Special Distinction  
2002 Fellow, American College of Radiology  
2002-2011 Associate Editor of Radiology  
2011- 12 Consultant to the Editor for Radiology  
2011 Innovator of the Year, University of Arizona (top faculty innovator in entire university)  
2012 Journal of Vascular Interventional Radiology, Editor's Honoree for Laboratory Investigation for paper entitled, "Dodecafluoropentane emulsion decreases infarct volume in a rabbit ischemic stroke model."  
2014 Selected to be International Visiting Professor to Chile by the Radiological Society of North America.  
2015 Arizona Innovation Challenge Winner - \$250,000 to NuvOx from Arizona Commerce Authority, February 1<sup>st</sup>, 2105  
2016 Winner Venture Madness, 1<sup>st</sup> place out of 113 competitors, \$60,000 cash prize from Arizona Commerce Authority with \$50,000 investment to NuvOx Pharma, March 4<sup>th</sup>, 2016  
2017 Winner, AZBio, Fast Lane Competition, NuvOx Pharma selected as one of 3 top life sciences companies in State of Arizona, October 11<sup>th</sup>, 2017.

**PROFESSIONAL SOCIETIES:**

1986-1988	Philadelphia Roentgen Ray Society
1986-present	American Roentgen Ray Society American College of Radiology Society for Magnetic Resonance Imaging Radiologic Society of North America Society for Magnetic Resonance in Medicine
1988-present	Association of University Radiologists
1992-2003	Society of Cardiovascular Interventional Radiology
2003-present	Controlled Release Society
2005-2007	American Heart Association
2005-present	American Institute of Ultrasound in Medicine
2005-present	Society for Molecular Imaging
2016-present	Society of Neuro-Oncology

**ACADEMIC APPOINTMENTS:**

1986-1988	Assistant Clinical Professor, Department of Radiology, Temple University, Philadelphia, PA
1988-1990	Assistant Professor, Department of Radiology, the University of Arizona, Tucson, AZ
1990-1995	Associate Professor, Department of Radiology, the University of Arizona, Tucson, AZ
1995-present	Professor of Radiology, The University of Arizona, Tucson, AZ Member of AZ Cancer Center, the University of Arizona Medical Center, Tucson, AZ
1995-present	CME Consulting Faculty Member, The University of Arizona, Tucson, AZ
1997-present	Faculty Member, Biomedical Engineering Program, the University of Arizona, Tucson, AZ

**SPECIAL ADMINISTRATIVE RESPONSIBILITIES:**

1988-1994	Director of Computed Tomography and Magnetic Resonance Imaging The University of Arizona Health Sciences Center
1988-1994	Director of Body Imaging Fellowship
1994-1999	Director of Cross-Sectional Imaging The University of Arizona Health Sciences Center. Selected clinical equipment and negotiated contacts for equipment purchases 1988-present, equipment consisting of Toshiba 900S 4th generation CT, 1.5 Tesla GE Signa, 0.5 Tesla GE Signa, a total of over \$4 million. Primary organizer of Biological Magnetic Resonance Facility, a \$300,000 building project, and purchase of a 4.7 Tesla Bruker Biospec \$800,000 research instrument.
2008-present	Focused Ultrasound Surgery Foundation Scientific Advisory Board
2008-present	Co-Director Arizona Cancer/Molecular Imaging Program
2008-present	Advisor Residency Research Program
2008-2012	Member Gene and Drug Delivery Study Section NIH
2010	Ad Hoc Member NCI Nanotechnology Study Section
2010	NCI P50 Boston University Cancer Center Site Visit for NCI
2011	NCI Special Emphasis Panel - "Cancer Diagnostic and Therapeutic Agents Enabled by Nanotechnology"

**COMMITTEES:**

1986-1988	Jeanes Hospital Cancer Care Committee
1986-1988	Delaware Valley MRI Educational Committee
1988-1989	University of Arizona Bioengineering Committee
1990	Society for Magnetic Resonance Imaging Technical Displays Committee
1991-1993	Surgery Clerkships Review Subcommittee Member, the University of Arizona
1990-1998	Cancer Activities Committee, the University of Arizona
1991-1998	Academic Review Committee, the University of Arizona, Dept. of Surgery
1992	Lectureship Selection Committee for Fifth Annual Waddell Lectureship The University of Arizona
1992-present	Executive Committee member, AZ Cancer Center
1992	Radiation Oncology External Review Committee

1992-1993	Chairman, Committee on Subspecialization, Department of Radiology The University of Arizona
1994-1996	Radiology Selection Committee
1994-1998	Consulting Faculty, Continuing Medical Education, the University of Arizona
1994-1998	Radiology Operations Committee
1994-1998	Ad-Hoc Committee on Clinical Drug Studies, The University of Arizona
1995-1999	Hematology/Oncology Service Team
1996-1998	Radiology Sabbatical Committee
2000-present	Southern Statewide Advisory Board of the AZ Cancer Center
2003-2006	NIH Study Section, Gene and Drug Delivery Systems
2007- present	Focused Ultrasound Surgery Foundation grant review committee
2008-present	Focused Ultrasound Surgery Foundation Scientific Advisory Board
2008-present	Co-Director of Arizona Cancer Imaging Program
2010-2012	Architectural Planning for AZCC Phoenix Cancer Facility
2014-present	Member Scientific Review Committee, Arizona Cancer Center

#### **DIAGNOSTIC RADIOLOGY TEACHING CONFERENCES:**

- One 1-hour lecture weekly to the residents and fellows on magnetic resonance imaging and computed tomography.
- Introduction to magnetic resonance imaging and computed tomography, and the physics lectures for magnetic resonance imaging for first year residents; annually.
- Organized a monthly CT follow-up conference, for the CT/ultrasound section.
- Musculoskeletal/body MR imaging conference to residents, fellows and faculty. This conference covers current cases.
- Two hours of lectures per month to the medical students on introductory topics in radiology focusing on CT and MRI.

## **RESEARCH TEACHING:**

1986-1988	Undergraduate research in MRI
1988-present	Research Elective in Diagnostic Radiology focusing upon the development of new contrast agents for MRI, and development of new forms of MR imaging.
2008 – present	Faculty member for Biomedical Engineering Drug Development Course

## **CLINICAL TEACHING:**

At various times from July of 1988 to September of 2005 I was involved in a number of teaching conferences for:

- Weekly conferences in Radiation, Surgical and Medical Oncology. Present the imaging studies that go along with the clinical cases being presented, and discuss the relevant imaging findings.
- Bimonthly Gastrointestinal Oncology Study Group. Discuss specific GI oncology patients in a multidisciplinary setting to help provide potential treatment options (usually with an investigational protocol for those patients with esophageal, gastric, hepatic and pancreatic cancer or recurrent, metastatic or refractory colorectal cancer
- Biweekly Thoracic Oncology Conference. Present current imaging cases of thoracic oncology patients.
- Monthly/Bimonthly Medical Rounds. Present radiologic findings for unknown cases to medical house staff.
- 2009 to present – weekly hepatobiliary pancreatic tumor board conference

## **CLINICAL TEACHING RESPONSIBILITIES:**

- During clinical assignments, usually CT and MRI clinical areas, teach residents, fellows and medical students. This is often in a one-one situation, but may include as many as three residents, a fellow and two or three medical students. Review all current clinical cases, show them the finer points of the different imaging modalities. Include referring physicians in teaching efforts so that they may more appropriately use the department's services.

## **SPONSORSHIP OF VISITING RADIOLOGISTS:**

01/15-01/30/1993	Gabriel Aguilar, M.D.	Mexico
02/1993	Sven Karmann, M.D.	Germany
12/13/1993-02/10/1994	Hasan Özgür, M.D.	Turkey
12/01/19-0/31/1994	Victor Mihalache, M.D.	Romania
02/14-02/25/1994	Joaquin Antillon, M.D.	Mexico
04/17-07/14/1995	Imtiaz Hossain, M.D.	Norway
10/6-11/07/1997	Kanchi Maya Sherpa, M.D.	Nepal

## **HOBBIES/SPORTS:**

- Alpine skier, cross country skier and mountaineer
- Former Class "A" ski racer
- Captain, University of California Berkeley Ski Team, 1975-1976
- Far West Ski Association, Senior Champion, 1975-1976
- Certified scuba diver
- Marathon runner and competitive cyclist.
- Finisher; Ironman Triathlon World Championships, Hawaii, 1982 and 1983
- Summer of 1985 age division winner in several Mid-West triathlons
- Multi-year State Champion in United States Cycling Federation Road Race and Hill Climb events
- First Place winner National road race and time trial for tandem in the Park City UCSF Cycling Festival 2005
- Climbed Aconcagua (23,000') 2006
- Fluent in Spanish, enjoy reading Spanish literature

- Medical teaching outreach in Mexico, in Spanish
- Fishing, mountain biking

## GRANTS:

1. Recipient Summer Research Fellowship Grant (\$2,000), University of California, San Francisco, Summer 1979, with continuing research on "Effect of IgG Blocking Antibodies on Radioimmunoassay for IgE."
2. Principal Investigator NIH Biomedical Research Support Grant (\$6,000), Washington University, 1983 and completed project. "MRI Using Gadolinium Labeled Antibodies."
3. Principal Investigator, NIH RFA, June 30, 1988. "Liposomes as MR Contrast Agents." \$400,000 awarded for research. August 1988 to August 1991.
4. Principal Investigator Biomedical Research Support Grant (\$6,000). University of Arizona, 1988-1989. "Liposomes as MR Contrast Agents."
5. Principal Investigator American Cancer Society Institutional Research Grant (\$7,000). January 1989. "Liposomal BCNU for Treatment of Glioma."
6. Principal Investigator, "Liposomes as MR Contrast Agents." \$25,000 awarded from the AZ Disease Control Commission, July 1, 1989 through June 30, 1990.
7. Principal Investigator, "Liposomes as MR Contrast Agents to Improve Diagnosis of Cancer." \$114,000 awarded from the American Cancer Society, July 1, 1989 through June 30, 1991.
8. Principal Investigator, Toshiba Medical Systems, \$110,000 awarded, "University of Arizona/Toshiba MR Research Project." August 1989.
9. Principal Investigator, "Paramagnetic Manganese Based Liposomes as MR Contrast Agents." \$80,000 awarded from Mallinckrodt, Inc. to develop new manganese based contrast agents for magnetic resonance imaging. February 1990 to January 1991.
10. Principal Investigator, "Enhanced MR Imaging of Lymph Nodes." Advanced Magnetics, Inc. \$33,000 awarded for April 1, 1990 to April 1, 1991.
11. Principal Investigator, "Advanced Applications of Toshiba 900S CT Scanner." \$71,000 funded by Toshiba Medical Corporation, 1992.
12. Principal Investigator, "MR-Guided Hyperthermia and Advanced Imaging Applications at 1.5T." \$100,000 awarded from GE Medical Systems for August 1990 - September 1991.
13. Principal Investigator, "Correlative Studies at 1.5 and 0.5 Tesla." \$50,000 awarded from GE Medical Systems for April 1992 - March 1993.
14. Principal Investigator, "The Macromolecular Contrast Agent for Magnetic Resonance." \$4,366 awarded from BioMedical Frontiers for August 1991 - December 1991.
15. Principal Investigator, "Development of a GI MR Contrast Agent". \$250,000 awarded from Bristol Myers Squibb to ImaRx Pharmaceutical Corp. Subsequent milestone payments over \$1,000,000. Project led ultimately to successful development of new GI MR contrast agent, LumenHance®, subsequently FDA approved.
16. Co-investigator, "Ultrasound Contrast Agents." \$50,000 for SBIR Phase I grant from FDA for September 1991 - March 1992.
17. Co-investigator "Vascular Ultrasound Contrast Agent". \$500,000 for phase II SBIR from FDA, 1993-1994.
18. Principal Investigator, "MR of Hyperthermia Imaging Studies and 1.5 T MR Research." \$100,000 awarded for GE Medical Systems. 1992

19. Principal Investigator, "Targeted MR Contrast Agents." Awarded \$47,000 by the AZ Disease Control Research Commission from July 1, 1991 to June 30, 1999.
20. Principal Investigator, "Development of Liver MR Contrast Agents". \$800,000 awarded by Mallinckrodt Medical Inc. to ImaRx Pharmaceutical Corp., 1992-1993.
21. Co-investigator, "Phase I Study of Immunotherapy of Malignant Melanoma by Direct Gene Transfer". Vical, Inc. 1996-2000.
22. Principal Investigator, "Development of Gastrointestinal Ultrasound Contrast Agent". \$10 million received in milestones. Successful development of FDA approved product, SonoRx®. 1993.
23. Principal Investigator, "Development of New Vascular Ultrasound Contrast Agent". Milestone payments from DuPont and Yamanouchi, 1996. Milestones totaling over \$60 million. Successfully developed new vascular ultrasound contrast agent, Definity®. Sold Definity to DuPont in October 1999 for \$36 million.
24. Co-investigator, Phase I SBIR, "Development of Thrombus Specific Ultrasound Contrast Agent". \$75,000 received from NIH 1998.
25. Co-investigator, Phase II SBIR, "Development of Thrombus-Specific Ultrasound Contrast Agent." \$75,000 received from NIH 1999 to 2001.
26. Co-investigator, Phase I SBIR, "Development of Paclitaxel Nanoparticle Drug Delivery System". \$100,000, 2002.
27. Principal Investigator, "Development of Novel Chemotherapy Drug Delivery System". Elan Pharma over \$10 million awarded in January, 2001. Project centered on development of novel delivery system for paclitaxel and other hydrophobic drugs. Due to commercial problems with partner only about \$4 million was received.
28. Principal Investigator, "Novel Diagnosis and Treatment of Prostate Cancer Using Ultrasound and Targeted Delivery Systems, \$1,422,117.00 NCI contract awarded, N01 CO 37 118, 9/30/2003-4/30/2007. The major goal of this project is to develop a sub-micron (approx. 200 nm) emulsion for selective delivery to alpha-6 beta-1 receptors on prostate tumor cells.
29. Co-investigator, "Sonothrombolysis of Vascular Clots with Targeted Bubbles," 2 R44 HL 71433-03. \$1,114,749 received from NIH 7/1/2005-6/30/2008. Grant to my lab, PI – Matsunaga. The major goals of this project are to develop targeted microbubbles for binding to the GPIIb/IIIa receptor on platelet-rich thrombi followed by ultrasound-mediated dispersion of the clots.
30. Co-investigator, "Novel Ultrasound Mediated Delivery Systems", \$1,037,105 subcontract to my lab, RO1 CA 103828 (Ferrara, Matsunaga sub, 5/1/2004 – 4/30/2009, NIH/NCI, \$1,037,105). Ultrasound Imaging and Local Drug Delivery in Tumors. The major goals of this project are to develop targeted bubbles to the alpha v beta 3 receptor on angiogenic tumors.
31. Principal Investigator, NIH STTR, 1R41NS057860-01A-1, Targeted Blood Brain Barrier Permeability Changes with Ultrasound and Microbubbles, \$949,596.00 in total funding, Sept. 1st 2007 to August 31st, 2009.
32. PI of subcontract, NIH 1 R01 EB009050-01, Ultrasound and Targeted Microbubbles to Treat Myocardial Infarction, PI Xie, \$201,600 in funding to my lab in sub-contract 2008 to 2013. My lab makes non-targeted bubbles and bubbles targeted to GPIIb/IIIa and to fibrin for the project.
33. Co-investigator, "Microbubble Enhanced FUS for More Efficient Therapy of Uterine Fibroids," \$102,324.00 received from FUS Foundation, April 2009 to April 2010.
34. Principal Investigator, "Development of Novel Sensitizer to Improve Response of Hypoxic Tumors to Radiation," 1R43CA144817-01, \$204,000, 7/01/2010 to 12/31/2010.
35. Program Co-Leader, Arizona Cancer Center Imaging Program, NCI P50, January 2010 to present provides about 10% of my salary support from NCI.



36. Co-PI, "Biological nanocomposites (BNC) to diagnose diabetic pre-retinopathy." QTDP program, stimulus funds from federal government through IRS. \$488,000.00, July 1<sup>st</sup> 2010 to December 31<sup>st</sup>, 2010. My lab does the bulk of the work on this project preparing the nanoparticles and targeting ligands for theranostic targeted to e-Selectin in diabetic pre-retinopathy.
37. PI of sub-contract, Nanocomposite Imaging System for the Eye. NIH SBIR, 1R43EY021438-01, \$273,487.00 Fiscal year 2011.
38. Co-investigator, "Development of TOLD MRI as Biomarker Imaging of Tumor Reoxygenation," \$25,000. University of Arizona Department of Radiology. I provide mentorship on this project.
39. PI of "Development of Molecular Imaging Agents and Methods to Detect High Risk Atherosclerotic Plaque," Solicitation No. PHS 2014-1 NHLBI SBIR Phase I Topic #85, \$225,000, contract # HHSN268201400045C September 8th 2014 – September 7th 2015. Project includes subcontracts to the University of Arizona and the Oregon Health Sciences University.
40. PI of "Nanoparticle-based Sensitizer for Radiation Therapy of Glioblastoma." NCI Phase II SBIR, \$1,000,0002, R44CA144817 - 02A1. Received notice of award. October 2014 to October 2015. Project develops biomarker imaging methods for tumor re-oxygenation using dodecafluoropentane emulsion (NVX-108) in treatment of glioblastoma multiforme in association with chemo-irradiation treatment of glioblastoma. Project has subcontracts to Barrow Neurological Institute in Phoenix (University of Arizona Cancer Center) and Stanford University.
41. Corresponding PI of "Pancreatic Ductal Adenocarcinoma Targeted Ultrasound Contrast Agent Development." \$300,000. 1R41 000000-00, April 15<sup>th</sup>, 20016 to April 14<sup>th</sup>, 2017
42. Corresponding PI, "Targeted and Non-Targeted Microbubbles for Pediatric Applications," (Fibrin-targeted microbubbles to treat endocarditis with ultrasound), NHLBI, Phase I STTR, \$300,00
43. Corresponding PI, "Dodecafluoropentane Prevents Ischemia Reperfusion Injury in Contemporary Acute Myocardial Infarction Management", Phase I STTR, NHLBI, R43HL137545, 4/01/2017-03/31/2018\$332,003
44. Corresponding PI, "Ph Ib Study of NVX-508 for Sickle Cell Disease, IND 129184 ,",1R01FD005737-01 (FDA) -\$250,000. Received score = 10, awaiting notice of award.
45. Corresponding PI, "Development of a syringe/sonication device employed to administer DDFPe in the prehospital setting," 1R43NS105295-0, 09/01/2017- 02/28/2018. \$150,000. Received score = 18, awaiting notice of award.
46. Consultant, "Development of New Improved Perflutren Ultrasound Contrast Agent," NHLBI HL137447-01 04/01/2017 – 03/31/2019. \$1,668,122.45. Note, I wrote this grant. It funds the company Microvascular Therapeutics, that I funded.

### **Pending Grants**

1. Corresponding PI, "Randomized Prospective Phase II Clinical Trial of NVX-108 in Association with Chemoradiation of Glioblastoma. \$3M awaiting notice of award

### **CLINICAL TRIALS:**

1. Principal Investigator. Phase II/III Clinical Trial: Superparamagnetic Iron Oxide As An Oral MR Contrast Agent. Sponsored by Advanced Magnetics, Inc.
2. Co-Investigator. Phase I/II Clinical Trial of an Oral Gastrointestinal Ultrasound Contrast Agent. Funded by ImaRx Pharmaceutical Corp.
3. Co-Investigator. Pilot Study in Human Volunteers of Manganese-Based Oral MR Contrast Agent. 1991-1992. Funded by ImaRx Pharmaceutical Corp.

4. Principal Investigator. Percutaneous Ethanol Injection Therapy of Liver Tumors. University of Arizona, 1993-1995.
5. Principal Investigator. Evaluation of Clinical Utility of Autoshim Capacity on Signa 0.5 T. Sponsored by GE Medical Systems. 1993.
6. Co-Investigator. Gene Therapy of Metastatic Malignant Melanoma. Funded by Vical Inc., San Diego, CA. 1993-1996.
7. Principal Investigator. Investigational New Drug Application (IND) for Definity®-Enhanced Sonothrombolysis of Dialysis Grafts & Fistulae (SonoLysis™), March 2003.
8. Co-investigator. I helped design the trials and filed IND's for Microbubble-Enhanced SonoLysis treatment of acute ischemic stroke in association with t-PA , for multi-national trial, 2006 - 2009. Initially a single center pilot study was performed and then the subsequent multi-center, randomized, prospective trial. I helped design the studies and recruited the investigators.
9. Co-investigator. Multi-center clinical trial to test microbubble enhanced sonothrombolysis with 3D ultrasound in acute ST elevation MI. In 2010 we gained approval to commence this trial in the Netherlands. Enrollment was slow and inclusion criteria and study design were modified. Site in Sao Paulo, Brazil was initiate in Q2 of 2014 and enrollment has been rapid. I have right of reference to data from these trials.
10. Co-investigator and Chief Medical Officer. Phase Ib/II clinical trial of NVX-108 as radiation sensitizer in glioblastoma multiforme. Trial started in July of 2014 in Melbourne, Australia at Monash University. Trial is presently in dose expansion phase. Total of 4 sites in Australia are presently enrolling patients. I helped design the trial and recruited the principal investigator who is a medical oncologist. Data from this trial will be used to file an IND for a Phase II trial in Q4 of 2016.
11. Principal Investigator. Development of MVT-100 improved perflutren contrast agent. I have developed an improved version of the contrast agent Definity®, MVT-100. We have received guidance from the FDA that MVT-100 can be developed via the 505(b)2 pathway. We have designed the relevant clinical trials and development program. I wrote the direct to phase II SBIR grant with was funded for over \$1.5M.
12. 2015 – received Orphan Drug Designation for NVX-108 for glioblastoma. I led the efforts to submit the request to the FDA for this designation.
13. January of 2016, approval for IND for NVX-508 to treat sickle cell crisis. I led the efforts to submit the IND (including design of clinical trial, etc.).
14. February of 2016, received Orphan Drug Designation for NVX-508 for sickle cell disease. I led the efforts to submit the request to the FDA for this designation.
15. February of 2017, commenced Phase Ib/II clinical trial of NVX-208 in acute ischemic stroke, PI, Dr. William Culp. I helped design the clinical trial, etc.

#### **U.S. PATENTS:**

1. 5,088,499. Liposomes as Contrast Agents for Ultrasonic Imaging and Methods for Preparing the Same. Issued on February 18, 1992.
2. 5,123,414. Liposomes as Contrast Agents for Ultrasonic Imaging and Methods for Preparing the Same. Issued on June 23, 1992
3. 5,143,716. Phosphorylated Materials as Contrast Agents for Use in Magnetic Resonance Imaging of the Gastrointestinal Region. Issued on September 1, 1992.

4. 5,149,319. Methods for Providing Localized Therapeutic Heat to Biological Tissues and Fluids. Issued on September 22, 1992.
5. 5,205,290. Low Density Microspheres and Their Use as Contrast Agents for Computed Tomography. Issued on April 27, 1993.
6. 5,209,720. Methods for Providing Localized Therapeutic Heat to Biological Tissues and Fluids Using Gas Filled Liposomes. Issued on May 11, 1993.
7. 5,228,44. Gas Filled Liposomes and their Use as Ultrasonic Contrast Agents. Filed June 18, 1991. Issued on July 20, 1993.
8. 5,230,882. Liposomes as Contrast Agents for Ultrasonic Imaging and Methods for Preparing the Same. Issued on July 27, 1993.
9. 5,281,408. Low Density Microspheres and Their Use as Contrast Agents for Computed Tomography. Issued on January 25, 1994.
10. 5,305,757. Gas-Filled Liposomes and Their Use as Ultrasonic Contrast Agents. Issued on April 26, 1994.
11. 5,312,617. Liposoluble Compounds useful as Magnetic Resonance Imaging Agents. Issued on May 17, 1994.
12. 5,320,826. Phosphorylated Materials as Contrast Agents for Use in Magnetic Resonance Imaging of the Gastrointestinal Region. Issued on June 14, 1994. US Patent No.
13. 5,334,381. Liposomes as Contrast Agents for Ultrasonic Imaging and Methods for Preparing the Same. Issued on August 2, 1994.
14. 5,348,016. Apparatus for Preparing Gas Filled Liposomes for Use as Ultrasonic Contrast Agents. Issued on September 20, 1994.
15. 5,352,435. Liposomes as Contrast Agents for Ultrasonic Imaging and Methods for Preparing the Same. Issued on October 4, 1994.
16. 5,358,702. Methoxylated Gel Particle Contrast Media for Improved Diagnostic Imaging. Issued on October 25, 1994.
17. 5,368,840. Natural Polymers as Contrast Media for Magnetic Resonance Imaging. Issued on November 29, 1994.
18. 5,385,719. Copolymers and Their Use as Contrast Agents in Magnetic Resonance Imaging and in Other Applicatons. Issued on January 31, 1995.
19. 5,407,657. Hybrid Magnetic Resonance Contrast Agents. Issued on April 18, 1995.
20. 5,420,176. Novel Contrast Media for Ultrasonic Imaging. Issued on May 30, 1995.
21. 5,449,508. Phosphorylated Materials as Contrast Agents for Use in Magnetic Resonance Imaging of the Gastrointestinal Region. Issued on September 12, 1995.
22. 5,456,900. Low Density Microspheres and Their Use as Contrast Agents for Computed Tomography. Issued on October 10, 1995.
23. 5,456,901. Liposomes as Contrast Agents for Ultrasonic Imaging. Issued on October 10, 1995.
24. 5,458,127. Copolymers and Their Use as Contrast Agents in Magnetic Resonance Imaging and in 25. 5,466,438. Liposoluble Compounds Useful as Magnetic Resonance Imaging Agents. Issued on November 14, 1995.
26. 5,469,854. Methods of Preparing Gas-Filled Liposomes. Issued on November 28, 1995.

27. 5,517,993. Copolymers and Their Use as Contrast Agents in Magnetic Resonance Imaging and in Other Applications. Issued on May 21, 1996.
28. 5,525,326. Phosphorylated Materials as Contrast Agents for Use in Magnetic Resonance Imaging of the Gastrointestinal Region. Issued on June 11, 1996.
29. 5,527,521. Low Density Microspheres and Suspensions and Their Use as Contrast Agents for Computed Tomography and in Other Applications. TomoRx™. Issued June 18, 1996.
30. 5,542,935. Therapeutic Delivery Systems Related Applications. Issued on August 6, 1996.
31. 5,547,656. Low Density Microspheres and Their Use as Contrast Agents for Computed Tomography and in Other Applications. Issued on August 20, 1996.
32. 5,558,092. Methods and Apparatus for Performing Diagnostic and Therapeutic Ultrasound Simultaneously. Issued on September 24, 1996.
33. 5,571,497. Liposomes as Contrast Agents for Ultrasonic Imaging and Apparatus and Methods for Preparing the Same. Issued on November 5, 1996.
34. 5,580,575. Therapeutic Drug Delivery Systems. Issued on December 3, 1996.
35. 5,585,112. Method of Preparing Gas and Gaseous Precursor-Filled Microspheres. Issued on December 17, 1996.
36. 5,624,661. Hypoosmotic Compositions Comprising a Polymer and a Complexed Contrast Agent for MRI. Issued on April 29, 1997.
37. 5,624,662. Liposoluble Heterocyclic Compounds Useful as Magnetic Resonance Imaging Agents. Issued on April 29, 1997.
38. 5,628,327. Apparatus for Performing Biopsies and the Like. Issued on May 13, 1997.
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40. 5,645,816. Synthetic Polyuronic and Hypoosmotic Polymer Compositions in Admixture With Proteinaceous Bound Contrast Agents for MRI. Issued July 8, 1997.
41. 5,656,211. Apparatus and Method for Making Gas-Filled Vesicles of Optimal Size. Issued August 12, 1997.
42. 5,658,550. Non Cross-Linked Synthetic Polymers as Contrast Media for Magnetic Resonance Imaging. Issued August 19, 1997.
43. 5,681,542. Compositions Comprising a Biocompatible Gas and a Polymer for Magnetic Resonance Imaging. Issued October 28, 1997.
44. 5,705,187. Compositions of Lipids and Stabilizing Materials. Issued January 6, 1998.
45. 5,714,528. Novel Contrast Agents for Ultrasonic Imaging. Issued February 3, 1998.
46. 5,714,529. Novel Contrast Agents for Ultrasonic Imaging. Issued Feb 3, 1998.
47. 5,715,824. Methods of Preparing Gas Filled Liposomes. Issued February 10, 1998.
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49. 5,736,121. Stabilized Homogeneous Suspensions as Computed Tomography Contrast Agents. Issued April 7, 1998.

50. 5,762,910. Liposoluble Compounds Useful as Magnetic Resonance Imaging Agents. Issued June 9, 1998. Memsomes.
51. 5,769,080. Gas Filled Liposomes and Stabilized Gas Bubbles and their Use as Ultrasonic Contrast Agents. Issued June 23, 1998.
52. 5,770,222. Therapeutic Drug Delivery Systems. Issued June 23, 1998.
53. 5,773,024. Container with Multi-Phase Composition for Use in Diagnostic and Therapeutic Applications. Issued June 30, 1998.
54. 5,776,429. Method of Preparing Gas-Filled Microspheres Using Lyophilized Lipids. Issued July 7, 1998.
55. 5,824,312. Novel Sunscreen Agents from Natural Sources. Issued Oct 20, 1998.
56. 5,830,430. Novel Cationic Lipids and the Use Thereof. Issued Nov 3, 1998.
57. 5,846,517. Methods for Diagnostic Imaging Using a Renal Contrast Agent and a Vasodilator. Issued Dec 8, 1998.
58. 5,853,752. Method of Preparing Gas and Gaseous Precursor-Filled Microspheres. Issued Dec 29, 1998.
59. 5,874,062. Methods of Computed Tomography Using Perfluorocarbon Gaseous Filled Microspheres as Contrast Agents. Issued Feb 23, 1999.
60. 5,885,549. Phosphorylated Materials as Contrast Agents for Use in Magnetic Resonance Imaging of the Gastrointestinal Region. Issued March 23, 1999.
61. 5,922,304. Microspheres Useful in Magnetic Resonance Imaging. Issued July 13, 1999.
62. 5,935,553. Methods of Preparing Gas-Filled Liposomes. Issued August 10, 1999.
63. 5,948,387. Novel Contrast Media for Ultrasonic Imaging. Issued September 7, 1999.
64. 5,976,500. Gel Particle Contrast Media for Improved Diagnostic Imaging. Issued November 2, 1999.
65. 5,977,538. Optoacoustic Imaging System. Issued November 2, 1999.
66. 5,985,244. Polymers as Contrast Agents for Magnetic Resonance Imaging. Issued November 16, 1999.
67. 5,985,246. Methods of Ultrasonic Imaging. Issued November 16, 1999.
68. 5,997,898 Fluorinated Amphiphiles. Stabilized Compositions of Fluorinated Amphiphiles for Diagnostic Imaging and Drug Delivery, Unger, Filed June 6, 1995, Issued December 7, 1999 UNGR 0625
69. 6,001,335. Methods of Ultrasonic Imaging, Unger, Filed June 18, 1996, Issued December 14, 1999, UNGR 0728.
70. 6,010,682. Liposoluble Compounds Useful as Magnetic Resonance Imaging Agents. Unger, Shen; Filed November 15, 1998, Issued January 4, 2000, UNGR 1279.
71. 6,013,035. Apparatus for Performing Biopsies and the Like, Unger, Pereles, Filed January 31, 1997, Issued January 11, 2000 UNGR 0981.
72. 6,024,939. Novel Contrast Agents for Ultrasonic Imaging, Unger, Wu; Filed June 6, 1995, Issued February 15, 2000 UNGR 0669.
73. 6,028,066. Prodrugs Comprising Fluorinated Amphiphiles, Unger, Filed July 2, 1997, Issued February 22, 2000 UNGR 1114.

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75. 6,033,645. Methods for Diagnostic Imaging by Regulating the Administration Rate of a Contrast Agent, Unger, Matsunaga, Fritz, Ramaswami, Filed June 19, 1996, Issued March 7, 2000, UNGR 0725.
76. 6,033,646. Methods of Preparing Fluorinated Gas Microspheres, Unger, Fritz, Matsunaga, Ramaswami, Yellowhair, Wu, G., Filed February 2, 1998, Issued March 7, 2000, UNGR 1286.
77. 6,039,557. Apparatus for Making Gas Filled Vesicles of Optimal Size, Unger, McCreery, Yellowhair, Barrette; Filed April 7, 1997, Issued March 21, 2000, UNGR-1035.
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86. 6,139,819. Targeted Contrast Agents for Diagnostic and Therapeutic Use. Issued October 31, 2000.
87. 6,143,276. Methods for Delivering Bioactive Agents to Regions of Elevated Temperatures. Issued November 7, 2000.
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91. 6,403,056. Method for Delivering Bioactive Agents Using Cochleates. Unger, Filed March 31, 2000, Issued June 11, 2002, UNGR 1592.
92. 6,414,139 Silicon Lipids. Silicon Amphiphilic Compounds and the Use Thereof, Unger, Shen, G. Wu, Filed September 3, 1996, Issued July 2, 2002, UNGR 0880.
93. 6,416,740. Novel Acoustically Active Drug Delivery Systems, Unger, Filed May 13, 1997, Issued July 9, 2002, UNGR 1338, Drug Delivery AAL's.
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96. 6,461,586. Method of Magnetic Resonance Focused Surgical and Therapeutic Ultrasound, Unger, Filed July 10, 2000, Issued October 8, 2002, UNGR 1595.
97. 6,479,034. Method of Preparing Gas and Gaseous Precursor-Filled Microspheres.
98. 6,521,211. Methods of Imaging and Treatment with Targeted Compositions, Unger, Wu, Filed February 3, 1999, Issued February 18, 2002, UNGR 1550.
99. 6,528,039. Low Density Microspheres and Their Use as Contrast for Computed Tomography and in Other Applications, Unger, Filed June 18, 1997, Issued March 4, 2003, UNGR 1174.
100. 6,537,246. Oxygen Delivery Agents and Uses for the Same, Unger, McCreery, Wu. Issued March 25, 2003, UNGR-0999.
101. 6,548,047. Thermal Preactivation of Gaseous Precursor Filled Compositions, Unger. Issued April 15, 2003, UNGR-1172.
102. 6,551,576. Container with Multi-Phase Composition for Use in Diagnostic and Therapeutic Applications, Unger, Matsunaga. Issued April 22, 2003, UNGR-1283.
103. 6,576,220. Non-Invasive Methods for Surgery in the Vasculature, Unger. Issued June 10, 2003. UNGR-1622.
104. 6,579,847. Method and Apparatus for Vascular Neuromuscular Blockade, Unger. Issued June 17, 2003. 4102-A1, Botox Stent.
105. 6,627,421. Methods and Systems for Applying Multi-Mode Energy to Biological Samples, Unger, Wu, McCreery. Issued September 30, 2003. UNGR-1605.
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107. 6,716,412. Methods for Ultrasound Treatment Using Gas or Gaseous Precursor-Filled Compositions. Issued April 6, 2004.
108. 6,743,779. Methods for Delivering Compounds Into A Cell. Issued June 1, 2004.
109. 6,773,696. Contrast Agent Comprising Low Density Microspheres. Issued August 10, 2004.
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111. 6,884,407. Methods for Diagnostic Imaging Involving the Use of a Contrast Agent and a Coronary Vasodilator. Issued April 26, 2005.
112. 6,998,107. Composition Comprising Low Density Microspheres. Issued February 14, 2006.
113. 8,822,549, Buffered Oxygen Therapeutic. Issued September 2<sup>nd</sup>, 2014.
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2. 660033 Liposoluble Compounds for Magnetic Resonance Imaging, Unger, Shen, Australia: Priority date May 23, 1991, Issued Oct. 16, 1995. UNGR-0215.
3. 660676 Low Density Microspheres and Their Use as Contrast Agents for Computed Tomography, Unger, Australia, Priority date Apr. 5, 1991, Issued Nov. 13, 1995. UNGR-0097.
4. 661344 Copolymers And Their Use As Contrast Agents In Magnetic Resonance Imaging And In Other Applications, Unger, Wu, Australia: Priority date Sep. 24, 1991, Issued Nov. 28, 1995. UNGR-0236.
5. 661701 Methods For Providing Localized Therapeutic Heat To Biological Tissues And Fluids Using Gas Filled Liposomes, Unger, Australia: Priority date Jun. 18, 1991, Issued Dec. 12, 1995. UNGR-0136.
6. 667471 Gas Filled Liposomes and their Use as Ultrasonic Contrast Agents, Unger, Wu, Australia: Priority date Jun. 18, 1991, Issued Aug. 13, 1996. UNGR-0117.
7. 667491 Gel Particle Contrast Media for Improved Diagnostic Imaging, Unger: Australia, Priority date Nov. 19, 1991, Issued Aug.13, 1996. UNGR-0260.
8. 667672 Novel Liposomal Drug Delivery Systems, Unger, Wu, Australia, Priority date June 18, 1991, Issued Aug. 13, 1996. UNGR-0155.
9. 671538 Contrast Media for Ultrasonic Imaging, Unger, Wu, Australia, Priority date May 31, 1991, Issued December 17, 1996. UNGR-0482.
10. 671862 Polymers as Contrast Media for Magnetic Resonance Imaging, Unger, Australia, Priority Date Oct 13, 1992, Issued Jan 7, 1997. UNGR-322.
11. EP0526,503B1 Polymers as Contrast Media for Magnetic Resonance Imaging. EPO, Unger: Priority Date Apr 10, 1990, Issued June 4, 1997. UNGR-0051.
12. EPO531,421B Novel Contrast Media for Ultrasonic Imaging, Unger, Wu, EPO; Priority date May 31, 1991, Issued Dec. 20, 1997. UNGR-0073.
13. 674285 Phosphorylated Materials as Contrast Agents for Use in MRI of the GI Region,Unger, Australia, Priority Date May 4, 1992, Issued Jun 19, 1997. UNGR-0195.
14. 678341 Methods for Providing Localized Therapeutic Heat to Biological Tissues and Fluids, Unger, Australia, Priority Date May 4, 1992, Issued Sep 18, 1997. UNGR-0176.
15. 678724 Liposoluble Compounds for Magnetic Resonance Imaging, Unger, Shen, Australia, Priority Date May 23, 1991, Issued Sep 25, 1997. UNGR-0726.
16. 683900 Methods of Preparing Gaseous Precursor-Filled Microspheres, Unger, Fritz, Matsunaga, Ramaswami, Yellowhair, Wu, Australia: Priority Date May 20,1994 Issued Nov 27, 1997, UNGR-0506.
17. 684088 Novel Therapeutic Drug Delivery Systems, Unger, Fritz, Matsunaga, Ramaswami, Yellowhair, Wu, Australia, Priority Date May 19, 1994, Issued Dec 4, 1997, UNGR-0424.
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21. 695357 Hybrid Magnetic Resonance Contrast Agents, Unger, Wu, Australia, Priority Feb 22, 1994, Issued Dec 17, 1998.
22. 696056 Novel Therapeutic Delivery Systems, Unger, Fritz, Matsunaga, Ramaswami, Yellowhair, Wu, Australia, Priority Nov 30, 1993, Issued Aug 27, 1998, UNGR-484.
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28. 708341 Gas and Gaseous Precursor Filled Microspheres as Topical and Subcutaneous Delivery Vehicles. Unger, Matsunaga, Yellowhair, Australia Priority November 30, 1993, Issued August 5, 1999, UNGR 0548.
29. 709471 Stabilized Homogeneous Suspensions As Computed Tomography Contrast Agents, Unger, Australia Priority May 19, 1995, Issued August 26, 1999, UNGR 0643.
30. 709562 Novel Targeted Compositions for Diagnostic and Therapeutic Use, Unger, Shen, Wu, Australia, Priority June 6, 1996, Issued September 2, 1999, UNGR 0947.
31. EPO 693,288B Polymers As Contrast Agents for Magnetic Resonance Imaging, Unger, EPO, Priority April 10, 1990, Issued October 13, 1999, UNGR 0324.
32. BR PI 1100994-2 Method of Preparing Gas and Gaseous Precursor-Filled Microspheres, Unger, Fritz, Matsunaga, Ramaswami, Yellowhair, Wu, Brazil, Priority November 30, 1993, Issued May 26, 1998, UNGR 1116.
33. 708341 Gas and Gaseous Precursor Filled Microspheres As Topical and Subcutaneous Delivery Vehicles, Australia, Issued August 5, 1999, Priority November 30, 1994, UNGR 0548.
34. 711788 Methods and Apparatus for Performing Diagnostic and Therapeutic Ultrasound Simultaneously, Unger, Yellowhair, Australia, Priority June 6, 1995, Issued October 21, 1999, UNGR 0921.
35. 713127 Methods of Preparing Gas-Filled Liposomes. Unger, Fritz, Matsunaga, Ramaswami, Yellowhair, Wu, Australia, Priority June 11, 1993, Issued November 25, 1999 UNGR 1534.
36. 715681 Stabilized Compositions of Fluorinated Amphiphiles for Diagnostic Imaging and Drug Delivery, Australia, Priority June 6, 1995, Issued February 10, 2000, UNGR 0837, Fluorinated Amphiphiles
37. 3-053217 Methods for Providing Localized Therapeutic Heat to Biological Tissues and Fluids Using Gas-Filled Liposomes, Japan, Priority June 18, 1991, Issued June 19, 2000, UNGR 0153, Therapeutic Heat
38. 721923 Compositions of Lipids and Stabilizing Materials, Australia, Priority April 5, 1995, Issued July 20, 2000, UNGR 0885.
39. EP 804932 Low Density Microspheres and Their Use as Contrast Agents for Computed Tomography, EPO, Priority April 5, 1991, Issued May 16, 2001, UNGR 1175.
40. 2,107,466 Low Density Microspheres and Their Use as Contrast Agents for Computed Tomography, Canada, Priority April 5, 1991, Issued July 3, 2001, UNGR 0098.
41. 731072 Methods of Preparing Gas-Filled Liposomes, Australila, Priority June 11, 1993, Issued March 22, 2001, UNGR 0446.
42. 732440 Novel Therapeutic Delivery Systems, Australia, Priority November 30, 1993, Issued April 26, 2001, UNGR 0488.
43. 733492 Methods of Preparing Fluorinated Gas Microspheres, Australia, Priority April 30, 1996, Issued May 17, 2001 UNGR 1043.
44. 732813 Improved Methods for Diagnostic Imaging Involving Use of a Contrast and a Coronary Vasodilator, Australia, Priority September 11, 1996, UNGR 1092.

45. 746056 Methods for Diagnostic Imaging Using a Renal Contrast Agent and a Vasodilator, Issued May 3, 2001, Australia, Priority September 11, 1996, UNGR 1202.
46. 736301 Methods for Delivering Compounds into a Cell, Issued July 26, 2001, Australia Priority April 30, 1997, UNGR 1123.
47. 736153 Methods and Apparatus for Performing Diagnostic and Therapeutic Ultrasound Simultaneously, Issued July 26, 2001, Australia, Priority May 24, 1996 UNGR 0921.
48. EP 616508 Gas Filled Liposomes and Their Use As Ultrasound Contrast Agents, EPO Granted July 18, 2001, Priority June 18, 1991, UNGR 0119.
49. RU 2181998 Novel Compositions of Lipids and Stabilizing Materials, Issued May 10, Russian Fed. 2002, Priority April 5, 1995, UNGR 0884.

### **EDITORSHIPS:**

Editor - Academic Radiology – 2002  
 Associate Editor – Radiology – 2002 - 2011  
 Editor - Magnetic Resonance Imaging  
 Editor - Investigative Radiology 1989-1994  
 Editor - Investigative Radiology, special issue on contrast media December 1997 and December 1998  
 Reviewer - Journal of Magnetic Resonance Imaging  
 Reviewer - Lymphology  
 Reviewer - Radiology  
 Reviewer - Journal of Medicinal Chemistry  
 Reviewer - Abstracts for Society of Magnetic Resonance Imaging 1991, 1993, and 1994  
 Book Reviewer - Imaging of the Head and Neck by Valvassori, Mafee and Carter, Thieme Medical Publishers, New York. JMRI March/April 1996, p. 412-413  
 Reviewer – Nature Biotechnology 2002 - Present  
 Reviewer – Radiology 2002 - Present  
 Reviewer – American Journal of Drug Delivery 2003 - Present  
 Reviewer - Annals of Neurology 2003 - Present  
 Reviewer – Biomedical Research Technology 2003 - Present  
 Reviewer – Journal of Controlled Release 2003 - Present  
 Reviewer – Biochimica et Biophysica Acta 2004 - Present  
 Reviewer - Contrast Media and Molecular Imaging 2006- Present  
 Reviewer - Magnetic Resonance In Medicine 2006 - Present  
 Reviewer – Physics in Medicine and Biology 2006 – Present  
 Reviewer – Nature Cardiology 2008  
 Reviewer – American Association of Physics in Medicine 2006 – Present  
 Reviewer – Ultrasound in Medicine and Biology 2005 - Present

### **GRANT REVIEWER:**

U.S. Army's Breast Cancer Research Program (NIH) 1994  
 Laboratory of Diagnostic Radiology Research (LDRR), NIH Intramural Research. Review Committee November 1994  
 Grant reviewer NIH, Medical Imaging Centers (ICMIC's) November 1999  
 RFA 01-012 – Small Animal Imaging Resource Programs, March 5-6, 2001  
 P41 Resource – Craig Malloy-Review, University of Texas, Dallas. April 2001  
 NIH, National Center for Research Resources – Technology Development for Biomedical Applications: Phased Innovation Award, 2003

Biomedical Entrepreneurial Science Working Group, July 31-Aug 1, 2003

NIH Commons eRA Internet Assisted Review, Special Emphasis Panel/Initial Review Group - Biomedical Research Technology, October 15-16, 2003

NCI, Technology Development for Biomedical Applications, February 10-11, 2004

NIH Gene and Drug Delivery Study Section Panel, Bethesda, MD, March 3-5, 2004

Focused Ultrasound Surgery Foundation, May 2007 to present

Member NIH Gene and Drug Delivery Study Section 2008 to 2012

Ad Hoc Member NIH Nanotechnology Study Section , Bethesda, MD, March 31<sup>st</sup> – April 1<sup>st</sup>, 2010

Member, NCI Site Visit, Boston University Medical Center, Boston, Massachusetts, Cancer Center Review, 2010

Ad Hoc Member (NCI) Special Emphasis Panel to review applications in response to PAR-10-286, "Cancer Diagnostic and Therapeutic Agents Enabled by Nanotechnology (SBIR [U43/U44], Washington DC, July 12-13, 2011.

Ad Hoc Member, NCI Site Visit, University of Chicago Comprehensive Cancer Center, Cancer Center Review, October 29<sup>th</sup> to October 31<sup>st</sup>, 2012

Ad Hoc Member, NCI Site Visit, University of California, Los Angeles, Comprehensive Cancer Center Review, May 21<sup>st</sup> to 23<sup>rd</sup>, 2013.

Reviewer, National Cancer Institute (NCI) Special Emphasis Panel, Cancer Diagnostic and Therapeutic Agents Enabled by Nanotechnology (SBIR [U43/U44], July 11-12, 2013, Bethesda Maryland.

Reviewer, Dutch Technology Foundation STW, "Treatment in sight through sound." Veni grant, March, 2014.

Reviewer, NIH Special Emphasis Panel to review applications submitted in response to the Program Announcement PAR-13-185 on "Image –guided Drug Delivery in Cancer," October 16<sup>th</sup>, 2014.

Reviewer, NCI Siteman Cancer Center (Washington University, St. Louis) site visit, January 21-23, 2015.

Reviewer, Alpha Omega Alpha, Student Research Fellowship, 2017.

Reviewer, NCI University of Chicago Medicine Comprehensive Cancer Center site visit October 23-25, 2017.

#### **THESIS REVIEWER:**

External Thesis Reviewer, University of Oslo, School of Pharmacy, February 19-22, 2004

2010 University of Arizona on Thesis committees for 1 masters and 1 PhD student

2014 University of Arizona PhD Thesis committee for Leo Montilla

#### **ADVISOR TO INDUSTRY:**

1988-1989 Clinical Advisory Panel for Philips Medical Systems, MRI Division.

1990-1999 Clinical Advisory Panel for Squibb Diagnostics for the Development of MR Contrast Media.

1990-1999 President & Chief Executive Officer, ImaRx Pharmaceutical Corp.

1999-2006 President & Chief Executive Officer, ImaRx Therapeutics, Inc.

2008 Founder NuvOx Pharma

2009 Founder Microvascular Therapeutics

#### **CHAIRMAN/PANEL MEMBER AT SCIENTIFIC MEETINGS:**

1. Society of Magnetic Resonance in Medicine, August 17, 1989 - Chairman of Relaxometry of MR Contrast Agents.

2. Radiological Society of North America, November, 1989 - Chairman of Bone Marrow Imaging Scientific Session.
3. Society of Magnetic Resonance Imaging, 1990 - Chairman of MR Contrast Agents Session
4. Society for Magnetic Resonance in Medicine Symposium on Contrast Media, 1991 - Chairman of MR Contrast Agent Session
5. Ninth Annual Meeting of the SMRI, April 13-17, 1991 - Moderator of WIP: Contrast Agents
6. Radiological Society of North America, Chicago, IL, December 3, 1992 - Moderator of the Physics Session. MR Contrast Media.
7. Co-organizer, Society for Magnetic Resonance in Medicine Workshop on Interventional MRI, 1993.
8. 14<sup>th</sup> International Congress of Lymphology, Washington, DC, September 20-26, 1993. Co-chairman, session #4: Lymphatic & Lymph Node Imaging I: New Agents & New Technologies.
9. 14<sup>th</sup> International Congress of Lymphology, Washington, DC, September 20-26, 1993. Co-chairman, session #8: Lymphatic & Lymph Node Imaging II.
10. Radiological Society of North America, Chicago, IL, November 28-December 4, 1993. Moderator of Radiologic Physics Session.
11. Society of Magnetic Resonance, Dallas, TX, March 5-9, 1994. Moderator of the Musculoskeletal (joints) session.
12. AZ Cancer Center Retreat, "The War on Cancer", Tucson, AZ, September 17, 1994. Panel Member. Topic: "What are real and potential impacts of current treatment and prevention strategies in place at the Arizona Cancer Center?"
13. Radiological Society of North America, Chicago, November 26-December 1, 1995. Moderator of General Medical Physics: Instrumentation.
14. Practical Radiology & Fundamental Intervention Course, San Carlos, Mexico, March 26, 1996. Moderator - Body Imaging and Intervention.
15. Ultrasound Contrast Research Symposium, San Diego, CA, February 7, 1998. Moderator - Scientific Session III.
16. Chairman, Basic Science, Bubble Behavior & Contrast Imaging, 4<sup>th</sup> International Symposium on Ultrasound Contrast Imaging, Tokyo, Japan, December 15, 2002.
17. Panel member, Venture Capital Panel Event, Eller College of Business and Public Administration, Department of Finance, The University of Arizona, November 25<sup>th</sup> and December 2<sup>nd</sup>, 2003.

#### **WORKSHOP ORGANIZER:**

SMR: Interventional MRI Workshop, Boston, Massachusetts, October 8-9, 1994.

University of Arizona Cancer Center: Cancer Imaging Program Retreat, Large Data Sets in Cancer Imaging and Opportunities for Machine Learning, Tucson, AZ, May 22<sup>nd</sup>, 2017.

#### **VISITING PROFESSORSHIPS:**

1. University of Modena, Modena, Italy, October 30, 1989.
2. Michigan State University, Lansing, Michigan, November 19-20, 1990.
3. Brigham Women's Hospital, Harvard Medical School, Boston, Massachusetts. April 30, 1991.

4. University of Minnesota Medical School, May 13-14, 1993.
5. University of Kyoto, Japan, May 24, 1997.
6. University of Rochester Medical Center, Department of Radiology, Rochester, New York. November 3, 1998.
7. University of Texas, San Antonio Hospitals Ft. Sam Houston-Brooke Army Medical Center, August 24-25, 1999.
8. Northwestern University, Chicago, IL, January 31, 2000.
9. Yale University, New Haven, CT, February 16-17, 2000.
10. Vanderbilt University Medical School, Nashville, TN, April 26, 2001.
11. University of Oslo, Norway, School of Pharmacy, February 19, 2004. "Therapeutic Applications of Microbubbles."
12. Brigham & Women's Hospital, Harvard Medical School, Boston, MA, April 7, 2004. "Microbubbles and Acoustically Active Agents in Molecular Imaging and Therapy."
13. UCLA, Radiology Grand Rounds, April 15, 2004. "Microbubbles and Acoustically Active Agents in Diagnostic Imaging and Therapy."
14. University of Maryland, Baltimore, MD, September 5<sup>th</sup>, 2004. "Microbubble Enhanced Sonothrombolysis from Benchtop to Bedside in Multi-Center Clinical Trials for Stroke" and "MR-Guided Focused Ultrasound Sugery."
15. University of Washington, Seattle, WA, October 23<sup>rd</sup> and 24<sup>th</sup>, 2008. "Molecular Imaging with Ultrasound and Contrast Agents" and "Therapeutic Applications of Ultrasound."
16. UC San Diego, San Diego, CA, February 15<sup>th</sup> 2011. Grand Rounds: "Therapeutic Applications of Microbubbles."
17. University of Wisconsin College of Pharmaceutical Sciences, Madison, Wisconsin. Drug and Gene Delivery with Microbubbles. December 8, 2011.
18. University of Chile, Hospital Padre Hurtado and Clinica Alemana, October 5<sup>th</sup> – 17<sup>th</sup>, 2015. Visiting Professor for the Radiological Society of North America. Gave a total of 11 different lectures on body and oncologic imaging.
19. Emory University, Atlanta Georgia, September 12<sup>th</sup>-14<sup>th</sup>, 2017. Visiting Professor, Department of Radiology.

#### **ABSTRACTS:**

1. Unger EC, Totty W, Otsuka P, Welch M. Magnetic Resonance Imaging Using Gadolinium Labeled Monoclonal Antibody. RSNA, Washington, DC, November 27, 1984, RSNA Scientific Program, p. 146.
2. Unger EC, Glazer H, Lee JKT. MRI of Hematoma. American Roentgen Ray Society Meeting (ARRS), Boston, MA, April, 1984.
3. Unger EC, Gutierrez F. Ytterbium-DTA: A Potential Intravascular Contrast Agent. ARRS Meeting, Boston, MA, April, 1985.
4. Unger EC. Gadolinium-DTPA Liposomes: A Potential MR Contrast Agent for the Liver and Spleen. City-Wide Conference, Mallinckrodt Institute of Radiology, St. Louis, MO, November 12, 1985.
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143. Takauchi M, McCreery TP, Ogunyankin K, Vannan M, Sheahan M, Connolly R, Santanen A, Unger E, Pandian N. A New Tissue Targeted Ultrasound Contrast Agent, MRX408 Improves Visualization and Delineation of Left Atrial Appendage Clot with Conventional 2-dimensional Echocardiography. ACC, Atlanta, GA, March 28-April 1, 1998.
144. Unger E, Wu Q, McCreery T, Gertz E. A New Targeted Ultrasound Agent Enhances Clots on Ultrasound Images and Facilitates Sonothrombolysis. 13<sup>th</sup> Annual Advances in Echocardiography: Contrast Echocardiography and Perfusion Imaging. Chicago, IL, September 17-18, 1998.
145. Unger et al. Ultrasound Enhancement of Gene Expression and Gene Delivery Using Acoustically Active Carriers. 1998 AAPS Annual meeting and exposition. San Francisco, CA, November 15-19, 1998.
146. Unger et al. New System for the Delivery of Genetic Materials. 8<sup>th</sup> Symposium on Antisense DNA/RNA. Chiba, Japan, November 18-19, 1998.
147. McCreery TP, Sweitzer R, Gertz EW, Unger E, Matsunaga TO. Development of a Quantitative in Vitro Ultrasound Binding Assay for the Determination of Microbubble Binding to Thrombus. 4<sup>th</sup> Annual Ultrasound Contrast Research Symposium in Radiology. San Diego, CA, February 5-7, 1999.
148. Gertz EW, McCreery TP, Sweitzer RH, Caldwell VE, Matsunaga TP, Unger EC. Ultrasound Targeted Microbubbles – Characterization Beyond Acoustic Properties. 4<sup>th</sup> Annual Ultrasound Contrast Research Symposium in Radiology. San Diego, CA, February 5-7, 1999.
149. Wu Q, Zhao H, McCreery T, Sweitzer R, Gertz EW, Unger E, Schumann P. Acoustic Activated Liposphere – Properties and Drug-Carrying Capabilities. 4<sup>th</sup> Annual Ultrasound Contrast Research Symposium in Radiology. San Diego, CA, February 5-7, 1999.
150. Unger EC, McCreery TP, Sweitzer R, Caldwell V. Ultrasound Enhanced Gene Expression and Gene Delivery. International Conferences on Gene Therapy and Molecular Biology & Medicine. Redwood City, CA, April 15-20, 1999.

151. Unger E, Matsunaga T, McCreery T, Sweitzer R. Gas-Filled Microspheres: Surface Modifications and Biomaterial Properties. Surfaces in Biomaterials Foundation Meeting. Scottsdale, AZ, September 1-4, 1999.
152. Unger EC, Caldwell VE, McCreery TP, Sweitzer RH. Biomedical Implications of a Thrombus-specific Ultrasound Contrast Agent. CMR, Woodstock, VT, September 12-17, 1999.
153. Zaetta J, Unger EC, Ovitt T. The Effect of Acoustic Imaging Parameters on Image Enhancement from a Thrombus Specific Contrast Agent. CMR '99. Woodstock, VT, September 12-17, 1999.
154. Wu Q, Zhao H, Unger EC, McCreery TP, Sweitzer R. Properties and Activation of Drug Carrying Lipospheres. RSNA, Chicago, IL, Nov 28-Dec 3, 1999.
155. Marcus FI, Krupinski EA, Ovitt T, Unger E, Gear K. Reader Agreement in the Diagnosis of Arrhythmogenic Right Ventricular Cardiomyopathy from Magnetic Resonance Images. American College of Cardiology, Atlanta, GA, March 2002.
156. Unger EC. Microbubbles as Targeted Imaging and Delivery Agents – Emphasis on Gene Delivery. Society for Molecular Imaging, Boston, MA, Aug 24, 2002.
157. Unger EC. Nanoparticle Drug Delivery System for Intravenous Delivery of Topoisomerase Inhibitors. Controlled Release Society and National Cancer Institute 2<sup>nd</sup> International Symposium & Exposition on Tumor Targeted Delivery Systems, Rockville, MD, Sept 25, 2002.
158. Unger, EC. Ultrasound Targeted Gene & Drug Delivery. World Federation for Ultrasound in Medicine and Biology. Montreal, Canada, June 1-4, 2003.
159. Unger, EC. Porter TR, Matsunaga TO, Zutshi R. Microbubble-Enhanced Sonothrombolysis. Kyoto, Japan, October 28-29, 2003.
160. Unger, EC. About ImaRx. BIO 2004 Annual International Convention, San Francisco, CA, June 6-9, 2004.
161. Unger EC. Microbubble Enhanced Sonothrombolysis Treatment of Vascular Thrombosis. 48<sup>th</sup> American Institute of Ultrasound in Medicine (AIUM) Annual Convention, Categorical Course, “Targeted Contrast Agents for Ultrasound Imaging and Therapy,” Phoenix, AZ, June 20-22, 2004.
162. Unger, EC. ImaRx and SonoLysis™. Clinical Investigators’ Meeting, Scottsdale, AZ, June 21, 2004.
163. Unger, EC, Zutshi, R, Labell, R, et al., Ultrasound-Mediated Drug Delivery Systems for Intravascular and Extravascular Therapies, Third Annual Meeting of the Society for Molecular Imaging (SMI), St. Louis, MO, September 9-12, 2004.
164. Unger, EC., Masunaga, TO, LaBell, R, Schumann, P, Penrose, K, Kerschen, A, Tran, P, Ray Nagle, Cress, A, Dayton, P, Ferrera, K, Zutshi, R, Ultrasound-Mediated Therapies. 2006 AZ Bio Expo, April 4, 2006.
165. Unger, EC, Feng Xie, John Lof, Terry Matsunaga, Jason Johanning, Tom Thomas, Thomas Porter, The Impact of Simultaneous Diagnostic Ultrasound Guided Therapy in Ultrasound and Microbubble Induced Lysis of Intravascular Thromboses, AHA, May 2005.
166. Unger, EC, Terry Masunaga, Reena Zutshi, Thomas Porter, Kathleen Ferrera, Paul Dayton, Andrei Alexandrov, William Culp, Nanobubbles in Image-Guided Therapy. 2006 AIUM Annual Convention, Washington D.C., May 23-26, 2006
167. Unger, EC, Feng Xie, John Lof, Terry Matsunaga, Jason Johanning, Tom Thomas, Thomas Porter. The Impact of Diagnostic Ultrasound Guidance in Therapeutic Ultrasound and Microbubble Induced Lysis of Deep Intravascular Thrombosis. AHA Scientific Sessions, November 13-16, 2005, Dallas, TX.
168. Unger, E.C. Treatment of Ischemic Stroke with Nanobubbles and Ultrasound. Acoustical Society of America, June 5-9, 2006, Providence, RI.

169. Unger, EC. Near-Future Therapies with Bubbles and Ultrasound. 79<sup>th</sup> Annual Scientific Meeting of Japan Society of Ultrasonics in Medicine, Japan, May 27, 2006.
170. Unger, EC. Gene Delivery with Microbubbles and Ultrasound. The 22<sup>nd</sup> Annual Advances in Contrast Ultrasound and Atherosclerotic Imaging, September 7<sup>th</sup>, 2006, Chicago, Illinois.
171. Unger EC. , Development of DDFPe as an Oxygen Therapeutic. The 26<sup>th</sup> Annual Advances in Contrast Ultrasound and Atherosclerotic Imaging, September 23<sup>rd</sup>, 2006, Chicago, Illinois.
172. Unger EC, Dodecafluoropentane for Oxygen Delivery. Acoustical Society of America. April 22<sup>nd</sup>, 2010, Baltimore, MD.
173. Unger EC, Marinelli E, El Mehdi D, Williams S, Touroo J, Kaplan H, Johnson JLH, E-selectin Targeted Nanocomposites for Imaging Uveitis. The 27<sup>th</sup> Annual Advances in Contrast Ultrasound September 21<sup>st</sup>, 2012, Chicago, Illinois.
174. Unger EC, Cancer Applications of Focused Ultrasound Surgery and Microbubbles. The 28<sup>th</sup> Annual Advances in Contrast Ultrasound October 3<sup>rd</sup>, 2013, Chicago, Illinois.
175. Unger E, Johnson JLH, Baker A. Dodecafluoropentane Nano-Emulsion Oxygen Therapeutic – Radiation Sensitization of Hypoxic Tumors. CMR 2013 Symposium in Beijing, China, November 2-5, 2013.
176. Unger E. Cancer Applications of Focused Ultrasound Surgery and Microbubbles. 29<sup>th</sup> Annual Meeting of the International Contrast Ultrasound Society, September 2014, Chicago, IL.
177. Unger E, Olson P, Williams S, Marinelli E, El Mehdi DE, Touroo JS, Nanoconjugates as Targeted Agents for Molecular Ultrasound and Fluorescence Imaging Diagnosis and Staging of Uveitis and as Theranostic Agents. Radiological Society of North America. December 2<sup>nd</sup> 2014, Chicago, IL.
178. Lickliter J., Ruben J., Longacre O., Wilson D. and Unger E., 2015. Abstract CT313: Phase Ib trial of dodecafluoropentane as a radiation sensitizer during chemoradiation for glioblastoma. *Cancer Research*, 75(15 Supplement), pp.CT313-CT313.
179. Unger E. NVX-108 as Radiosensitizer in Treatment of Glioblastoma. 29<sup>th</sup> Annual Meeting of the International Contrast Ultrasound Society, September 10-12, 2015, Chicago, IL.
180. Unger E, Lindner J, et al. Targeted Microbubbles to Vulnerable Plaque for Ultrasound Molecular Imaging. Annual Meeting of the International Contrast Ultrasound Society, October 4<sup>th</sup> and 5<sup>th</sup>, 2017. Chicago, IL.
181. Unger E, Mason R, Zhou H, Sellenger M, Ruben J, Lickliter J, Longacre O. Phase I/II study of DDFPe as a radiosensitizer in glioblastoma. 21<sup>st</sup> Annual Scientific Meeting of the Society for Neuro-Oncology. Abstract RTHP-27, November 18<sup>th</sup>, 2016, Scottsdale, AZ.
182. Becker J, Unger E, Stea B, Lickliter J, Ruben J, Mason R, Carmody R, Zhou H, Sellinger M, Longacre O, Graham K. Told MRI Characterizes the *in vivo* effects of DDFPe on Tumor Oxygenation as a Pharmacodynamics (PD) Biomarker in Glioblastoma Multiforme. The University of Arizona Cancer Center Scientific Retreat, April 21<sup>st</sup>, 2017, Tucson, AZ.
183. Unger E, Mocetti F, Weinkauff C, Hadinger K, Davidson B, Belcik T, Matsunaga T, Marinelli E, Lindner J. Targeted Ultrasound Contrast Agent for Vulnerable Plaque. Contrast Media Research, Durango, October 22<sup>nd</sup> – 25<sup>th</sup>, 2017.

#### **INVITED PRESENTATIONS:**

1. Unger EC. MRI of the Liver. Tucson Radiological Society, October 3, 1988.
2. Unger EC. Magnetic Resonance Imaging. Parents Day, College of Medicine, The University of Arizona, Seventh Annual Parent's Day Program.

3. Consultant and Speaker at Philips Musculoskeletal MRI Clinical Advisory Panel. March 7-8, 1989.
4. Unger EC. Body MR Applications. Southeast AZ Health Education Center, Continuing Medical Education Conference, Nogales, AZ, March 15, 1989.
5. Unger EC. Fast Scanning Techniques, Spinal Metastases MRI vs. Myelography, MR of the Knees and Bone Marrow Imaging. MRI 1989: National Symposium, four separate lecturers, speaker on April 30-May 5, 1989, Orlando, FL.
6. Unger EC. Musculoskeletal MRI. Philips MR Users Seminar, Salt Lake City, UT. May 15-16, 1989.
7. Unger EC. Musculoskeletal MR and Bone Marrow Imaging. Phoenix Radiological Society Conference, Phoenix, AZ, May 17, 1989.
8. Unger EC. Optimizing Image Quality At 0.5 Tesla. First Annual Clinical Mid-Field MRI Seminar, Seattle, WA, August 26, 1989.
9. Unger EC. MRI in Oncology, Liver, Splenic and Bone Marrow Disease. Italian Society of Medical Oncology, Modena, Italy, October 31, 1989.
10. Unger EC. Basic MR Spectroscopy. Imaging of the Central Nervous System Conference, February 19-23, 1990, Tucson, AZ.
11. Unger EC. Liposomal MR Contrast Agents for Imaging the Liver. Symposium - "Liver Imaging for the 1990s – Magnetic Resonance, Computed Tomography, Ultrasound." Harvard Medical School, Boston, MA, June 25-27, 1990.
12. Unger EC. What's New in Magnetic Resonance Imaging. Imaging of the Central Nervous System Conference, February 19-23, Tucson, AZ.
13. Unger EC. Imaging the Joints, Bone and Soft Tissue Tumors and Musculoskeletal Imaging. Imaging the Head, Spine and Musculoskeletal System, Kauai, HA, February 17-22, 1991.
14. Unger EC. Staging of Musculoskeletal Tumors with CT and MRI. 7th Annual Post Graduate Course, Practical Radiology, University of Arizona, Tucson, February 25-28, 1991.
15. Unger EC. Advances in MR Contrast Media Development. Magnetic Resonance Institute Post Graduate Course, UCSD, San Diego, CA, March 8, 1991.
16. Unger EC. MRI in the Evaluation of Musculoskeletal Neoplasms. Dept. of Orthopedics Basic Science Teaching Schedule, UA, March 1991.
17. Unger EC. Hyperscanning and Other Novel Techniques in Body Imaging. Magnetic Resonance Institute Post Graduate Course, UCSD, San Diego, CA, March 8, 1991.
18. Unger EC. MR of the Temporomandibular Joint. Tucson Dental Association, Tucson, AZ, March 12, 1991.
19. Unger EC. Beyond Gadolinium-DTPA: Ferrites, Perfusion, and Organ Specific Contrast Agents, Soft Tissue Lesions: MR Imaging and Histologic Correlation, MR of Bone Tumors, and MR of Bone Marrow. 8th Annual Magnetic Resonance Imaging 1991: National Symposium, Orlando FL, April 28, 1991.
20. Unger EC, Shen DK, Fritz, TA. Liposomes as MR Contrast Agents: Pros and Cons. SMRM Workshop on Contrast Enhanced Magnetic Resonance, May 23-25, 1991.
21. Unger EC. What's New in MRI; MR of the Shoulder; Other applications of MR Imaging (two-day workshop). The Medical College of Wisconsin's Sharper Image in MRI Series, August 12-16, 1991.
22. Unger, EC. Modern Imaging. Presented to AZ Health Sciences Center Advisory Board, September 26, 1991.



23. Unger EC. Clinical Indications for Body MRI. Presented to the Southeast AZ Area Health Education Center, Nogales, AZ, October 2, 1991.
24. Unger EC. Medical Ignorance in MRI. Presented to The International Conference on Medical Ignorance: The Problem and The Challenge, The Curriculum on Medical Ignorance, University of Arizona Health Sciences Center, November 14-16, 1991.
25. Unger EC. MRI of the Knee. Presented to the MRI Update 1992: MR Angiography and Imaging of the Head, Spine and Musculoskeletal System, University of Wisconsin, Continuing Medical Education in Tucson, AZ, February 17-21, 1992.
26. Unger EC. MRI of the Shoulder. Presented to the MRI Update 1992: MR Angiography and Imaging of the Head, Spine and Musculoskeletal System, University of Wisconsin, Continuing Medical Education in Tucson, AZ, February 17-21, 1992.
27. Unger EC. MRI of TMJ. Presented to the MRI Update 1992: MR Angiography and Imaging of the Head, Spine and Musculoskeletal System, University of Wisconsin, Continuing Medical Education in Tucson, AZ, February 17-21, 1992.
28. Unger EC. MRI of Bone and Soft Tissue Tumors. Presented to the MRI Update 1992: MR Angiography and Imaging of the Head, Spine and Musculoskeletal System, University of Wisconsin, Continuing Medical Education in Tucson, AZ, February 17-21, 1992.
29. Unger EC. Musculoskeletal and Body Imaging. Presented to the MRI Update 1992: MR Angiography and Imaging of the Head, Spine and Musculoskeletal System, University of Wisconsin, Continuing Medical Education in Tucson, AZ, February 17-21, 1992.
30. Unger EC. Body Imaging. Presented to the MRI Update 1992: MR Angiography and Imaging of the Head, Spine and Musculoskeletal System, University of Wisconsin, Continuing Medical Education in Tucson, AZ, February 17-21, 1992.
31. Unger EC. What's New in MRI. Presented to the Eighth Annual Practical Radiology Conference for Continuing Medical Education in Tucson, AZ, February 24-27, 1992.
32. Unger EC. MRI Contrast Agents. Presented to the Eighth Annual Practical Radiology Conference, for Continuing Medical Education in Tucson, AZ, February 24-27, 1992.
33. Unger EC. MRI of the Temporomandibular Joint. Presented to the Eighth Annual Practical Radiology Conference, for Continuing Medical Education in Tucson, AZ, February 24-27, 1992.
34. Unger EC. The Interface of Imaging with Therapy. Presented to the AZ Cancer Center Tumor Board, March 17, 1992.
35. Unger EC. Advances in Contrast Media. Dept. of Radiology, UA, Research Seminar, January 1992.
36. Unger EC. MRI Angiography of the Brain and Neck: Diffusion and Perfusion Imaging; MRI of the Orbit. Guest Lecturer, Third Annual MRI Workshop in Hawaii, March 22-27, 1992.
37. Unger EC. Musculoskeletal MRI, audiocassette made by Uddo & Associates Inc., New York, NY.
38. Unger EC. MR Angiography, Dept. of Orthopedics Basic Science Teaching Schedule, UA. April 1992.
39. Unger EC. Presentation of Chest Radiograph and Cardiac MRI, Clinicopathology Conference, UA, May 1992.
40. Unger EC. Percutaneous Ethanol Ablation of Liver Tumors, Dept. of Lithotripsy, UA, May 1992.
41. Unger EC. Development of Pharmaceuticals for Medical Imaging. Presented to the 1992 Medical Student Research Program, July 16, 1992.
42. Unger EC. Presentation of Radiologic Findings in Multiple Myeloma, UMC Tumor Board, AZ Cancer Center, September 1992.

43. Unger EC. Multiple Myeloma: Diagnosis and Therapy. Presented to the AZ Cancer Center Tumor Board, September 15, 1992.
44. Unger EC. Oral Contrast in MR Imaging. Presented to the GE National MR Users Seminar, Albuquerque, NM, October 1992.
45. Unger EC. Radiologic Findings in a Case of Fever of Unknown Origin, UMC Medical Grand Rounds, November 1992.
46. Unger EC. Hepatomegaly in a Heart Transplant Recipient. Presented to the Clinicopathology conference UMC, Tucson, AZ, December 4, 1992.
47. Unger EC. MR guided Ultrasonic Hyperthermia. Presented at The Future Potential of Cardiovascular Magnetic Resonance meeting in St. Moritz, Switzerland, January 1993.
48. Unger EC. MR of the Shoulder. Presented at the Radiology Department's postgraduate course, Tucson, AZ, February 23, 1993.
49. Unger EC. MR Angiography - Application in the Body. Presented at the Radiology Department's postgraduate course, Tucson, AZ, February 24, 1993.
50. Unger EC. Manejo de Tumores Hepaticos Mediante Alcohol. Presented for Sociedad de Gastroenterologia del Estado de Sonora, Hermosillo, Mexico, March 6, 1993.
51. Unger EC. MR Applications in the Abdomen. Presented at Phoenix MRI Society, Phoenix, AZ, March 24, 1993.
52. Unger EC. Liposomes as Paramagnetic Agents. Presented at the NCI Workshop, Bethesda, MD, April 1, 1993.
53. Unger EC. Emerging Applications in Interventional Imaging. Presented at the AZ Brain Center Symposium, Tucson, AZ, April 3, 1993.
54. Unger EC. Liposomes and Other Novel Blood Pool MR Contrast Agents. Presented at the University of Minnesota, May 14, 1993.
55. Unger EC. MR Imaging of the Abdomen. Presented at Magnetic Resonance Imaging Course for Technologists, Tucson, AZ, June 5, 1993.
56. Unger EC. CT and MR Anatomy for Radiation Therapy. Presented for the Department of Radiation/Oncology, AZ Health Sciences Center, Tucson, AZ, July 21, 1993.
57. Unger EC. Diagnostic Radiology in Oncology. Presented at AZ Cancer Center Northern Advisory Board, Scottsdale, AZ, September 7, 1993.
58. Unger EC. MR Imaging of the Lymphatics and Lymph Nodes. Presented at the 14th International Congress of Lymphology, Bethesda, MD, September 21, 1993.
59. Unger EC. Current Status of MR in Imaging of Lymphatics and Lymph Nodes. Presented at the 14th International Congress of Lymphology, Washington, D.C., September 23, 1993.
60. Unger EC. Development of Novel Pharmaceuticals for Magnetic Resonance, Ultrasound and Drug Delivery. Cancer Pharmacology Seminar Series, AZ Cancer Center, Tucson, AZ, October 19, 1993.
61. Unger EC. Physics of MR Imaging and CT. 402/502 Physics students. UA, October 21, 1993.
62. Unger EC. GI Tract. Radiology/Anatomy session for first-year medical students. UA, November 1993.
63. Unger EC. Interventional MR: Current status. Presented at the Magnetic Resonance Imaging Conference for Technologists, San Francisco, CA, February 18, 1994.

64. Unger EC. MR Angiography in the Extremities, Abdomen and Chest. Presented at the Magnetic Resonance Imaging Conference for Technologists, San Francisco, CA, February 18, 1994.
65. Unger EC. CT/MRI of Lung Masses. Presented at the Radiology Department's postgraduate course, Tucson, AZ, February 21, 1994.
66. Unger EC. Body Applications of MR Angiography. Presented at the Radiology Department's postgraduate course, Tucson, AZ, February 21, 1994.
67. Unger EC. Image Guided Lesion Ablation and Sclerosis. Presented at the Radiology Department's postgraduate course, Tucson, AZ, February 21, 1994.
68. Unger EC. Tumor Imaging for Improved Diagnostic Research. Presented at the Desert Hills Recreation Center, Green Valley, AZ, March 15, 1994.
69. Unger EC. Understanding Imaging Technology. Presented at the AZ Cancer Center Tumor Board, Tucson, AZ, May 17, 1994.
70. Unger EC. MRI of the Shoulder and Knee. Presented to orthopedic residents, University of Arizona, Tucson, AZ, May 25, 1994.
71. Unger EC. Bubbles in Medical Imaging. Presented to the Medical Student Research Program, University of Arizona, Tucson, AZ, June 7, 1994.
72. Unger E, Alexander A, Granström P. MR Guided Alcohol Ablation of the Body. Presented at Interventional MRI, Marina Del Rey, CA, August 14, 1994.
73. Unger EC. Bubbles in Medical Imaging. Radiology Research Seminar, UA, October 5, 1994.
74. Unger E. MR Guided Alcohol Ablation. Presented at SMR: Interventional MRI Workshop, Boston MA October 8-9, 1994.
75. Unger EC. Advances in Lymphatic Imaging. Presented at the 1st National Lymphedema Network Conference, San Francisco, CA, October 21-23, 1994.
76. Unger EC. GI Tract. Radiology/Anatomy session for first-year medical students. UA, October 31, 1994.
77. Unger EC. Physics of Cross Sectional Imaging: CT, MR, Ultrasound. Presented to the Medical Physics 402 class, The University of Arizona, Tucson, November 23, 1994.
78. Unger E. Spiral CT and MRI. Presented at the Surgery Grand Rounds, The University of Arizona, Tucson, December 7, 1994.
79. Unger E. Abdominal Applications of Spiral CT. Presented at the 11th Annual Post Graduate Course Practical Radiology, Tucson, AZ, February 22, 1995.
80. Unger E. MR of the Shoulder. Presented at the 11th Annual Post Graduate Course Practical Radiology, Tucson, AZ, February 22, 1995.
81. Unger E. New Strategies for Gene Therapy of Cancer: Stereotactic and Liposomal Delivery. Presented at the 1995 Symposium "Gene Therapy for Cancer", Tucson, AZ, March 24, 1995.
82. Unger E. Beyond Gadolinium - DTPA: Perfusion & Organ Specific Contrast Agents. Presented at Emerging Medical Technologies, Newport Beach, CA, March 28, 1995.
83. Unger E. Liposomes as Ultrasound Contrast Agents. Presented at the Leading Edge meeting, Atlantic City, NJ, May 10, 1995.
84. Unger E. Microbubbles as Contrast Agents and Drug Delivery Vehicles. Presented to the Medical Students Research Program, The University of Arizona, July 6, 1995.

85. Unger EC. New Concepts in Drug and Gene Delivery. Radiology Research Seminar. UA, September 6, 1995.
86. Unger E. Pediatric Applications of Spiral CT and MRI. Presented at the Pediatric Grand Rounds Teleconference, The University of Arizona, September 26, 1995.
87. Unger E. New Agents (Testicular Imaging). Presented at "Advances in Echocardiography: Contrast Echo, Perfusion and Imaging", Chicago, IL, October 13, 1995.
88. Unger EC. GI Tract. Radiology/Anatomy session for first-year medical students. UA, October 30, 1995.
89. Unger EC. Physics of Cross Sectional Imaging: CT, MR, Ultrasound. Presented to the Medical Physics 402/502 class, The University of Arizona, Tucson, November 7, 1995.
90. Unger E. Spiral CT and MRI of the Pediatric Chest. Presented to the Pediatric Pulmonary Section at the University of AZ Health Sciences Center, December 8, 1995.
91. Unger E. Contrast Agents for Spiral CT: IV and Oral Agents; Tips, Techniques and Protocols. Presented at "Spiral CT in Clinical Practice", Vail, CO, February 5, 1996.
92. Unger E. Advantages and Limitations of Spiral CT Versus Conventional CT. Presented at "Spiral CT in Clinical Practice", Vail, CO, February 5, 1996.
93. Unger E. Newer Procedures in Interventional CT: Lesion Sclerosis, PEI of Tumors, and CT Guided Interstitial Gene Therapy. Presented at "Spiral CT in Clinical Practice", Vail, CO, February 7, 1996.
94. Unger E. CTA Versus MRA: Which to Use for What Applications. Presented at "Spiral CT in Clinical Practice", Vail, CO, February 8, 1996.
95. Unger E. Imaging and Drug Delivery Applications of Aerosomes®. Ultrasound Contrast Symposium, San Diego, CA, February 24, 1996.
96. Unger E. Body MRA Update. MR Conference for Technologists, Dallas, TX, March 10, 1996.
97. Unger E. Everything You Need to Know About MR Contrast Media. MR Conference for Technologists, Dallas, TX, March 10, 1996.
98. Unger E. MR of the Abdomen. MR Conference for Technologists, Dallas, TX, March 10, 1996.
99. Unger E. New Horizons in Cancer Treatment PEI/CE/Gene Therapy. Practical Radiology and Fundamental Intervention, San Carlos, Mexico, March 26, 1996.
100. Unger E. Chest/Mediastinal Biopsy. Practical Radiology and Fundamental Intervention, San Carlos, Mexico, March 26, 1996.
101. Unger E. Spiral CT. Practical Radiology and Fundamental Intervention, San Carlos, Mexico, March 26, 1996.
102. Unger E. MRI/Soft Tissues. Practical Radiology and Fundamental Intervention, San Carlos, Mexico, March 27, 1996.
103. Unger E. Spiral CT: New Applications for Oncologic Imaging. Hematology/Oncology Research Conference, AZ Cancer Center, April 2, 1996.
104. Unger E. Aerosomes® - Phospholipid Coated Microbubbles as Ultrasound Contrast Agents. 2nd International Conference on Contrast Ultrasound, Hammersmith Hospital, London, England, May 3, 1996.
105. Unger E. DNA Delivery Using Liposomes, Gas-Filled Microspheres and Ultrasound. 2nd International Conference on Contrast Ultrasound, Hammersmith Hospital, London, England, May 3, 1996.

106. Unger, E. Development of Thrombus Specific Aerosomes® Ultrasound Contrast Agent for Diagnosis and Therapy. DuPont Merck, Boston, MA, May 6, 1996.
107. Unger E. Non-Cardiac Contrast Agents: Aerosomes®. The Leading Edge in Diagnostic Ultrasound, Atlantic City, NJ, May 7, 1996.
108. Unger E. Resonancia Magnética de Tumores Oseos. III Curso Internacional de Resonancia Magnética, Mexico City, Mexico, May 30, 1996.
109. Unger E. Resonancia Magnética de la Rodilla. III Curso Internacional de Resonancia Magnética, Mexico City, Mexico, May 30, 1996.
110. Unger E. Resonancia Magnética del Abdomen. III Curso Internacional de Resonancia Magnética, Mexico City, Mexico, May 30, 1996.
111. Unger E. Angiografía por RM vs. Angiografía TC Helicoidal. III Curso Internacional de Resonancia Magnética, Mexico City, Mexico, May 30, 1996.
112. Unger E. Tumores Malignos de los Tejidos Blandos. III Curso Internacional de Resonancia Magnética, Mexico City, Mexico, May 30, 1996.
113. Unger E. Advantages and Limitations of Spiral/Helical CT vs Conventional CT. National Symposium on Spiral/Helical CT , New York, NY, September 19, 1996.
114. Unger E. CTA vs MRA: Which Technique for What Application. National Symposium on Spiral/Helical CT, New York, NY, September 19, 1996.
115. Unger E. Interventional Procedures Including Lesion Sclerosis, PEI of Tumors and CT-guided Interstitial Gene Therapy. National Symposium on Spiral/Helical CT, New York, NY, September 21, 1996.
116. Unger E. Drug Delivery Applications of Ultrasound Contrast Agents. 2<sup>nd</sup> Thoraxcenter European Symposium on Ultrasound Contrast Imaging, Rotterdam, The Netherlands, January 23-24, 1997.
117. Unger E. Contrast-enhanced CT. Arizona Desert Radiology Society, Scottsdale, AZ, February 1, 1997.
118. Unger E. Spiral CT - CT Angiography. Arizona Desert Radiology Society, Scottsdale, AZ. February 1, 1997.
119. Unger E. CT- Guided Procedures. Arizona Desert Radiology Society, Scottsdale, AZ, February 1, 1997.
120. Unger E, Shen DK, Wu G, McCreery T, Sweizer R. A Thrombus Specific Ultrasound Contrast Agent. IX Congress Internazionale di Eccocardiografia, Rome, Italy, February 5-8, 1997.
121. Unger E. Newer Procedures in Interventional CT: Lesion Sclerosis, PEI of Tumors and CT-Guided Gene Therapy. Spiral CT in Clinical Practice, Snowmass, CO, February 9-14, 1997.
122. Unger E. Technical Principles of Spiral CT. Spiral CT in Clinical Practice, Snowmass, CO, February 9-14, 1997.
123. Unger E. Spiral CT of the Chest. Spiral CT in Clinical Practice, Snowmass, CO, February 9-14, 1997.
124. Unger E. Key Issues in Musculoskeletal Imaging with Spiral CT. Spiral CT in Clinical Practice, Snowmass, CO, February 9-14, 1997.
125. Unger E. Presentation of ImaRx Pharmaceutical Corp. A Private Look Conference, Rodman & Renshaw, Inc. New York, NY, April 30, 1997.
126. Unger E. Future Directions for Ultrasound Agents. Technical Review DuPont Merck, Billerica, MA, May 2, 1997.
127. Unger E. Acoustically Active Drug and Gene Delivery Systems. Kyoto University, Japan, May 24, 1997.

128. Unger EC. SonoPoration™ and FluoroGene™ Gene Delivery. International Congress on Gene Therapy and Molecular Biology, Crete, Greece, August 16-25, 1997.
129. Unger EC. Drug and Gene Delivery. 12th Annual Advances in Echocardiography: Contrast Echocardiography and Perfusion Imaging. Bubble Conference. Chicago, IL, September 19, 1997
130. Unger EC. FluoroGene and SonoPoration Gene Delivery. Artificial SelfAssembling Systems for Gene Delivery. Coronado, CA, October 13, 1997.
131. Unger EC, McCreery TP, Wu Y, Shen DK, Wu GL, Santanen A, Caldwell V. How Far From Clinical Use? Ultrasound-Directed Drug Delivery in Clinical Radiology. 3rd Thoraxcenter European Symposium on Ultrasound Contrast Imaging. Rotterdam, The Netherlands, January 22-23, 1998.
132. Unger EC. FluoroGene™ and SonoPoration™ Gene Delivery. Gene Therapy Conference, Lake Tahoe, NV, March 1-3, 1998.
133. Unger EC. Update on Thrombus-Specific Aerosomes®. The Leading Edge in Diagnostic Ultrasound, Atlantic City, NJ, May 19-22, 1998.
134. Unger EC, Shen D, Wu G, Stewart L, Matsunaga TO, Trouard T. Co-polymeric Gadolinium-based Macromolecular Contrast Agents. New Developments in Contrast Agent Research, 6<sup>th</sup> Special Topic Seminar, Salzburg, Austria, June 3-5, 1998.
135. Unger EC, McCreery TP, Sweitzer RH, Caldwell VE, Santanen A. Gene Activation and Gene Delivery with Ultrasound. International Congress on Acoustics, Seattle, WA, June 20-26, 1998.
136. Unger EC, McCreery TP, Shen DK, Wu GL, Sweitzer RH, Wu Q. Gas-Filled Liposomes as Ultrasound Contrast Agent for Blood Pool, Thrombus-Specific and Therapeutic Applications. International Congress on Acoustics, Seattle, WA, June 20-26, 1998.
137. Unger E. Ultrasound for Local Delivery of Genes or Drugs. Euroecho, European Society of Cardiology, Trieste, Italy, December 11, 1998.
138. Unger EC, Gertz E, McCreery TP, Shen D, Wu G, Wu Y, Sweitzer R. Visualization of Intravascular Thrombosis: Practical Implications. 4<sup>th</sup> Heartcentre European Symposium on Ultrasound Contrast Imaging. Rotterdam, The Netherlands, January 21-22, 1999.
139. Unger EC. MR in Urologic Imaging. The University of Arizona, Urology section, February 3, 1999.
140. Unger EC. Spiral CT. National Academy of Emergency Physicians. Tucson, AZ, February 20, 1999.
141. Unger EC. Microbubbles: Applications in Medical Imaging and Drug Delivery. Biomedical Engineering Seminar at the AZ Cancer Center, Tucson, AZ, March 5, 1999.
142. Unger, EC. Avances Tecnicos en el Diagnostico de Enfermedades Abdominales. Colegio de Cirujanos de Sonora, San Carlos, Mexico, May 1, 1999.
143. Unger EC. Auxiliares Diagnosticos en las Lesiones de Mama (Mamografia, Ultrasonido, y Biopsia de Mama). Colegio de Cirujanos de Sonora, San Carlos, Mexico, May 1, 1999.
144. Unger EC. Therapy and Drug Delivery with Microbubbles. The Leading Edge in Diagnostic Ultrasound, Atlantic City, NJ, May 11, 1999.
145. Unger EC. Therapeutic Applications of Microbubbles. 3<sup>rd</sup> International Meeting on Interventional Cardiology in Jerusalem, Israel, June 29, 1999.
146. Unger EC, McCreery TP, Sweitzer R, Caldwell V. Ultrasound Enhancement of Gene Expression and Gene Delivery Using Acoustically Active Carriers. Macromolecular Drug Delivery Conference, Breckenridge, CO, July 14-17, 1999.

147. Unger EC. Ultrasound for Localized Delivery. Energy-enhanced Drug Delivery Technologies Symposium, Johnson & Johnson, New Brunswick, NJ, September 14, 1999.
148. Unger EC. A View of the Future. Definity™ Radiology Core Faculty Meeting, Phoenix, AZ, October 22, 1999.
149. Unger EC. New Developments in Contrast Assisted Gene Therapy. The Leading Edge in Diagnostic Ultrasound, Atlantic City, NJ, May 23, 2000.
150. Unger EC. Ultrasound Mediated Drug Delivery – A New Era Using Ultrasound Contrast Agents? Acoustical Society of America, Atlanta, GA, May 30, 2000.
151. Unger EC. Passive and Energy Activated Drug Delivery. Biomedical Engineering Society, Tucson, AZ, September 6, 2000.
152. Unger EC. Microbubbles and Therapy. Advances in Echocardiography, Chicago, IL, September 14-15, 2000.
153. Unger EC. Delivery of Therapy and Drugs with Bubbles and Ultrasound. Second Symposium on Ultrasound Contrast for Radiological Diagnosis: Bubbles in Radiology. State of the Art. Toronto, Canada, October 24, 2000.
154. Unger EC. Papel del TAC en el trauma abdominal. XXIVth Annual Meeting of the Asociación Mexicana de Cirugía General, San Luis Potosí, México, October 31, 2000.
155. Unger EC. Hígado TAC y Resonancia. XXIVth Annual Meeting of the Asociación Mexicana de Cirugía General, San Luis Potosí, México, October 31, 2000.
156. Unger EC. Imagenología del sistema biliar por RM. XXIVth Annual Meeting of the Asociación Mexicana de Cirugía General, San Luis Potosí, México, October 31, 2000.
157. Unger EC. Angiografía por TAC y RM. XXIVth Annual Meeting of the Asociación Mexicana de Cirugía General, San Luis Potosí, México, November 1, 2000.
158. Unger EC. Biopsias dirigidas por TAC. XXIV Reunión Annual de la Asociación Mexicana de Cirugía General, San Luis Potosí, México, November 2, 2000.
159. Unger EC. Targeted Ultrasound Contrast Agents – Diagnostic and Therapeutic Applications. Burnham Institute, La Jolla, CA, November 7, 2000.
160. Unger EC. Spiral CT of Pulmonary Emboli. Surgery Grand Rounds, The University of Arizona, Tucson, AZ, November 15, 2000.
161. Unger EC. Thrombus-Specific and Other Targeted Ultrasound Contrast Agents. AIUM, Orlando, FL, March 12, 2001.
162. Unger EC. Potential Therapeutic Applications of Targeted Microbubbles. 2<sup>nd</sup> International Symposium on Sonodynamic Therapy - Recent Advances in Sonodynamic Approach to Tumor Treatment. Tokyo, Japan, March 30, 2001.
163. Unger EC. Opciones no Quirúrgicas en Ictericia Obstructiva. Curso de Cirugía 2001 Hígado. Hospital Central Militar. Mexico City, Mexico, May 31-June 2, 2001.
164. Unger EC. Métodos Diagnósticos en Patología Pancreática. Curso de Cirugía 2001 Hígado. Hospital Central Militar. Mexico City, Mexico, May 31-June 2, 2001.
165. Unger EC. Mamografía, Control de Calidad y BIRADS. 2da Jornadas Estatales de Cirugía. Juarez, Mexico, June 8-9, 2001.
166. Unger EC. Avances de Imagenología en Cáncer Abdominal. 2da Jornadas Estatales de Cirugía. Juarez, México, June 8-9, 2001.

167. Unger EC. HydroPlex™ Nanoparticles as Novel Drug Delivery Vehicles. 6<sup>th</sup> International Drug Delivery Technologies and Deal-Making Summit, Princeton, NJ, July 25-27, 2001.
168. Unger EC, Matsunaga TO, McCreery T, Schumann P, Sweitzer R, Quigley R. Therapeutic Applications of Targeted Microbubbles. 17<sup>th</sup> International Congress on Acoustics, Rome, Italy, September 2-7, 2001.
169. Unger EC. Targeted Microbubbles as Therapeutic and Diagnostic Agents. Imaging in 2020 II Conference. Jackson Hole, Wyoming, October 1-4, 2001.
170. Unger EC. The Entrepreneurial Scientist. Colloquium Series of the Professional Master's Degree Program, The University of Arizona, Tucson, AZ. November 14, 2001.
171. Unger EC, Matsunaga TO, McCreery TP, Sweitzer R, Schumann P, Quigley R, Zutshi R. Therapeutic Applications of Microbubbles, Acoustical Society of America. Fort Lauderdale, FL, Dec 3-7, 2001.
172. Unger EC. Energy-Mediated and Passive Gene Delivery Systems. The Knowledge Foundation, Washington, DC, December 6-7, 2001.
173. Unger EC. Novel Dual-Use Targeted Agents for Diagnosis and Non-Invasive Therapy. The Future Directions Session of the 7<sup>th</sup> European Symposium on Ultrasound Imaging, Rotterdam, The Netherlands, January 24, 2002.
174. Unger EC. Ultrasound Assisted Drug Delivery – Targeted Ultrasound Contrast Agents and Acoustically Active Carriers for Drug Delivery. AIUM, Nashville, TN, March 10-13, 2002.
175. Unger EC. Novel Drug Delivery Systems. IIR Drug Delivery Partnership Conference, Nice, France, April 26, 2002.
176. Unger, EC. About ImaRx. Nanotech Visibility Forum, Palo Alto, CA, May 30, 2002.
177. Unger EC. The Use of Ultrasound Contrast Agents to Enhance Focused Ultrasound Therapy Brigham & Women's Hospital and ISMRM, Cambridge, MA, June 20-21, 2002.
178. Unger EC. Gene Delivery Using Ultrasound and Ultrasound Contrast Agents. Molecular Imaging Conference, Department of Radiology and General Electric Medical Systems – Molecular imaging – Cardiovascular and Beyond, Michigan State University, July 13, 2002.
179. Unger EC. Microbubbles as Targeted Imaging, Thrombolysis and Delivery Agents – In Vivo Nanomechanical Devices. 2<sup>nd</sup> International Symposium on Therapeutic Ultrasound, Ekos & Phillips Medical Imaging, Seattle, WA, August 1, 2002.
180. Unger EC. Molecular Imaging – Plans and Strategies. First Annual Meeting of the Society of Molecular Imaging, Boston, MA, August 26, 2002.
181. Unger, EC. Nanoparticle Drug Delivery System for Intravenous Delivery of Topoisomerase Inhibitors. 2<sup>nd</sup> International Symposium on Tumor Targeted Delivery Systems, Rockville, MD, September 23, 2002.
182. Unger, EC., Paul Grayburn, Sanjiv Kaul, Jonathan Lindner, Fokert ten Cate, Gene Delivery Using Microbubbles and Ultrasound. 17<sup>th</sup> Annual Advances in Contrast Ultrasound Conference, Chicago, IL, November 1, 2002.
183. Unger, EC, Ultrasound Bubbles with Antibodies as a Therapeutic Tool, IBC's 13<sup>th</sup> Annual Antibody Engineering Conference, San Diego, CA, December 2, 2002.
184. Unger EC. Clinical Radiology Applications of Blood Pool Ultrasound Contrast Agents – Definity® (YM-454). 4<sup>th</sup> International Symposium on Ultrasound Contrast Imaging, Tokyo, Japan, December 14, 2002.
185. Unger EC. Gene Delivery Using Microbubbles & Ultrasound. 4<sup>th</sup> International Symposium on Ultrasound Contrast Imaging, Taipei, Taiwan, December 15, 2002.



186. Unger EC. Why Does My Medication Cost so Much? A Birds-Eye View of the Drug Development Process. Century Club, San Francisco, CA, February 5, 2003.
187. Unger EC. Novel Formulations of Anticancer Agents. Fifth Cancer Drug Symposium, Flynn Foundation, Phoenix, AZ, February 20, 2003.
188. Unger EC. Definity® & Gene Therapy Using Microbubbles and Ultrasound. 14<sup>th</sup> Ultrasound Doppler Meeting, Tokyo, Japan, March 15, 2003.
189. Unger EC. Definity® & Gene Therapy Using Microbubbles and Ultrasound. Tokyo Women's Medical University, Tokyo, Japan, March 17, 2003.
190. Unger EC. Therapeutic Imaging with (MRX-408) Microbubbles. The Leading Edge in Diagnostic Ultrasound, Philadelphia, PA May 13, 2003.
191. Unger EC. Surmounting Obstacles in Achieving Approvals for Imaging Agents. IBC Conference, Vienna, VA, June 3, 2003.
192. Unger EC. ITI Presentation, 2003 Life Sciences Financial Forum – UCSD CONNECT, San Diego, CA, June 12, 2003.
193. Unger EC. Drug & Gene Delivery with Microbubbles. Molecular Imaging Symposium, London, Ontario, Canada, July 20, 2003.
194. Unger EC. Invited to participate in “Biomedical Entrepreneurial Science Working Group”, National Institute of Biomedical Imaging and Bioengineering, NIH, August 1, 2003.
195. Unger EC. Presentation at BIO VentureForum West 2003, San Francisco, CA, October 16, 2003
196. Unger EC. Microbubble-Enhanced Sonothrombolysis. 18<sup>th</sup> Annual Advances in Contrast Ultrasound, Chicago, IL, October 31, 2003.
197. Unger EC. Business Strategies and Positioning. University of Arizona Professional Master's Degree Program in Applied Science and Business. Tucson, AZ, February 4, 2004.
198. Unger EC, LaBell R, et al. HydroPlex™ Nanoparticles of SN-38. The 6<sup>th</sup> Annual Cancer Drug Symposium at the Arizona Cancer Center, Tucson, AZ, February 20, 2004.
199. Unger EC, Zutshi R, et al. Novel Diagnosis & Treatment of Prostate Cancer using Ultrasound & Targeted Delivery Systems. 5<sup>th</sup> Annual PI Meeting for the Unconventional Innovations Program (UIP), San Diego, CA, March 1-2, 2004.
200. Unger E, Matsunaga TO, Zutshi R, et al. Microbubbles and Acoustically Active Agents in Molecular Imaging and Therapy. ISMRM Workshop, McLean, VA, April 2, 2004.
201. Unger EC. Imaging as a Tool for Nano-Invasive Surgical Procedures. 2004 Southwest BioPartnering Conference & Expo, Tucson, AZ, April 5-6, 2004.
202. Unger EC, Matsunaga T, et al. Ultrasound-Mediated SonoLysis™. The Leading Edge, Jefferson Ultrasound Institute, Atlantic City, NJ, May 12, 2004.
203. Unger EC. About ImaRx, San Francisco, CA, June 7, 2004.
204. Unger EC. Microbubble Enhanced Sonothrombolysis Treatment of Vascular Thrombosis. American Institute of Ultrasound in Medicine, Phoenix, AZ, June 22, 2004.
205. Unger EC. Ultrasound & Microbubbles in Thrombolysis. American Society for Echocardiography. San Diego, CA, June 29, 2004.

206. Unger EC. Ultrasound-Enhanced Delivery. Third Annual Meeting of the Society for Molecular Imaging (SMI), Symposium XIV: Enhancing Delivery and Traversing Barriers, Session: Overcoming Biological Barriers with Acoustically Active Carriers and Ultrasound, St. Louis, MO, September 12, 2004.
207. Unger EC, Wickline, S, McPherson, D, Cate, Folkert ten, Villanueva, Flordeliza, Lindner, Jonathan – Ultrasound-Directed Gene/Drug Therapy. 19<sup>th</sup> annual Advances in Contrast Ultrasound, Chicago, IL, November 5, 2004.
208. Unger EC. International Stroke Conference, New Orleans, LA. February 8, 2005
209. Unger EC. “NanoInvasive™ Medicine – Nanotechnology for Site-Specific Therapy.” NanoBioConvergence Forum, Palo Alto, CA, April 20, 2005.
210. Unger EC., Beardsley, R., Blonder, G., Palo, R., Chair, J. Wolfe, “Nanotechnology: Promising Near-Term Opportunities for Commercialization.” Bio Panel, Philadelphia, PA, June 20, 2005
211. Unger EC. Nanotechnology and Minimally Invasive Treatment of Thrombosis, Hospital de la Universidad de Monterrey, Monterrey, Mexico, August 16<sup>th</sup>, 2005.
212. Unger EC; Matsunaga TO; Zutshi R; LaBell, R; Tran P; Alexandrov, A. “Nanobubble-Enhanced Sonothrombolysis: From Benchtop to Bedside.” Fifth International Society on Therapeutic Ultrasound (ISTU), Boston, MA, October 27-29, 2005.
213. Unger EC. “Nanobubble-Enhanced Sonothrombolysis: From Benchtop to Bedside.” Fifth International Symposium on Therapeutic Ultrasound (ISTU) 2005, Boston, MA, October 28. 2005.
214. Unger E., Matsunaga T., Zutshi, R., Penrose, K., Schumann, P., Kerschen, A. “Ultrasound-Mediated Therapies Using Receptor-Targeted Nanodroplets.” Fifth International Society on Therapeutic Ultrasound (ISTU), Boston, MA, October 27-29, 2005.
215. Unger EC; Zutshi, R. Near-Future Applications of Nanobubbles. BIO Industry Organization of Southern Arizona (BIOISA). Tucson, AZ, March 3, 2006.
216. Unger EC. Nanobubbles in Image-Guided Therapy. Categorical Course, Topics in Emergency Ultrasound, Part I. American Institute of Ultrasound in Medicine (AIUM) National Convention, Washington, DC, March 25, 2006.
217. Unger E., Topics in Entrepreneurship for Scientists, University of Arizona, November 1<sup>st</sup>, 2006.
218. Unger E., Ultrasound-Mediated Delivery Using Nanodroplets Targeting Prostate Cancer. Advances in Contrast Ultrasound and Atherosclerotic Imaging, Bubble Conference 2007, Chicago, IL, September 6-7, 2007.
219. Unger E., Microbubble Enhanced Sonothrombolysis Treatment in Stroke, From Benchtop to Bedside and Multi-site Clinical Trials, University of Arizona, Dept of Bioengineering, October 1<sup>st</sup>, 2007.
220. Unger, E., Therapeutic Applications of Microbubbles – Sonothrombolysis and Beyond, IEEE International Ultrasonics Symposium and Short Courses, NY, NY, October 30<sup>th</sup>, 2007.
221. Unger E., Entrepreneurship in Science, Presented to University of Arizona Biomedical Engineering Society, November 8<sup>th</sup>, 2007.
222. Unger E., Targeted Contrast Agents for Therapeutic Ultrasound. The Leading Edge in Diagnostic Ultrasound Annual Conference, Atlantic City, NJ, May 20, 2008
223. Unger E., Acute DVT Lysis and IVC Filter in Categorical Course – Venous Thrombosis, American Institute of Ultrasound in Medicine. New York, NY, April 4<sup>th</sup>, 2009.
224. Unger E., Prospects in Multimodal Molecular Imaging of Cancer and the Lymphatic System 3rd International Symposium on Cancer Metastasis and the Lymphovascular System: Basis for Rational Therapy, May 8<sup>th</sup>, 2009, San Francisco, CA.

225. Unger E., Matsunaga T. and Porter T., Diagnostic Ultrasound Combined with Targeted Microbubbles Improves Recovery Following Acute Coronary Thrombosis in Cardiovascular Applications of Ultrasound Plenary Session, Acoustical Society of America, Portland, Ore. May 22<sup>nd</sup>, 2009.
226. Unger E., Matsunaga T., Kerschen A., Xie F. and Porter T., Targeted Opening of Blood Brain Barrier for Drug and Gene Delivery in Advances in Contrast Ultrasound – ICUS Bubble Course 2009, Chicago, IL, October 23<sup>rd</sup>, 2009.
227. Unger E., Ultrasound Contrast Agents and Ultrasound-Mediated Therapy, in Frontiers in Medical Research, September 29<sup>th</sup>, 2009, University of Arizona, Tucson, AZ.
228. Unger E., Development of Ultrasound Contrast Agents, workshop, World Molecular Imaging Congress, Kyoto, Japan, September, 2010.
229. Unger E., Oxygen Delivery with Dodecafluoropentane, Advances in Contrast Ultrasound – ICUS Bubble Course 2010, Chicago, IL, October, 2010.
230. Unger E., The Future: Targeted Ultrasound Contrast Agents, Institut Gustave Roussey, Contrast Enhanced Ultrasound Symposium, Paris France, April 4<sup>th</sup>, 2011.
231. Unger E., Cancer Imaging with Ultrasound Contrast Agents. The Leading Edge, Thomas Jefferson University CME Course, Altantic City, NJ, May 10<sup>th</sup>, 2011.
232. Unger E., Cancer Imaging - Targeted Ultrasound Contrast Agents. 4th International Symposium on Cancer Metastasis and the Lymphovascular System: Basis for Rational Therapy, NY, NY, May 14<sup>th</sup>, 2011.
233. Unger E., Diagnosing and treating venous disease. 2012 Annual Convention American Institute of Ultrasound in Medicine, Scottsdale, Arizona April 1st, 2012.
234. Unger E., Applications of Nanomaterials for Medical Imaging. Workshop on Nanomaterials for Medicine, University of Arizona, Tucson, AZ, February 17<sup>th</sup>, 2012.
235. Unger E. Gene Delivery with Ultrasound and Microbubbles. 16<sup>th</sup> Annual Meeting of the American Society of Gene and Cell Therapy. Salt Lake City, May 18<sup>th</sup>, 2013.
236. Unger E. Targeted Ultrasound Contrast Agents, Myth or Reality? 4th International Course of DCE-US in Oncology, PARIS, FRANCE, September 22<sup>nd</sup> 23<sup>rd</sup>, 2013.
237. Unger E. Cancer Applications of Focused Ultrasound Surgery and Microbubbles. The 28th Annual Advances in Contrast Ultrasound - ICUS Bubble Conference at The Park Hyatt Hotel, Chicago, IL, October 3-4, 2013.
238. Unger E. NuvOx Pharma. Venture Summit West, Computer History Museum, Mountain View, CA. February 12<sup>th</sup>, 2014.
239. Unger E. Gene Delivery with Ultrasound and Microbubbles. GTC's Cell & Gene Therapy Conference, San Diego, CA, February 21<sup>st</sup>, 2014.
240. Unger E. NuvOx Pharma Oxygen Delivery Nanotechnology. BIO International, San Diego California, June 24<sup>th</sup>, 2014.
241. Unger E. Therapeutic Applications of Ultrasound and Microbubbles. International Society of Contrast Ultrasound, Chicago, IL, September 19<sup>th</sup>, 2014.
242. Unger E. Reversing Tumor Hypoxia with NVX-108. BioPharm America, Boston, MA, September 24<sup>th</sup>, 2014.
243. Unger E. NuvOx Pharma – Clinical Stage Nanotechnology. BIO Investor Forum, San Francisco, CA, October 8<sup>th</sup>, 2014.

244. Unger E. Renal Trauma and Renal Infections. Sociedad de Radiologia de Chile, Santiago de Chile, October 15<sup>th</sup>-17<sup>th</sup>, 2015.

#### **POSTER PRESENTATIONS:**

1. Gadolinium-DTPA Liposomes as Potential MRI Contrast Agents. The Seventh Annual Meeting of the SMRM, San Francisco, California, August 23, 1988, Vol. 1, p. 512.
2. Liposomal Gadolinium DTPA Enhanced MR Imaging of Hepatic Metastases. Unger EC, MacDougall P, Fajardo L, Zerella A, Tilcock C. SMRM, August, 1989. Amsterdam, The Netherlands.
3. Small Unilamellar Paramagnetic Liposomes as MR Contrast Agents. Unger EC, Tilcock C. Contrast Media Research Meeting, Sydney Australia, October 9, 1989.
4. Small Unilamellar Paramagnetic Liposomes as MR Contrast Agents. SMRI 1990. Summa Cum Laude award.
5. Small Unilamellar Paramagnetic Liposomes as MR Contrast Agents. Unger EC, Tilcock C. Biophysics Congress Satellite, Whistler, British Columbia, August 23-27, 1990.
6. Intravenous Use of Ferrites for Enhancement of Rat Liver Tumors. Fritz T, Darkazanli A, Granstrom P, Zerella A, Unger E. SMRM. August 17-26, 1990.
7. Paramagnetic Liposomes: MR Imaging and Detailed Toxicological Studies. Unger E, Fritz T, Zerella A, Wilson-Sanders S, Ahkong Q, Tilcock C. SMRM. August 17-26, 1990.
8. A Novel Procedure for the Preparation of Liposomal Paramagnetic MR Contrast Agents. Tilcock C, Parr M, Ahkong QF, Unger E. SMRM. August 17-26, 1990.
9. Magnetic Resonance Imaging in Patients with Kaposi's Sarcoma Associated with Acquired Immunodeficiency Syndrome. Elam E, Witte M, Unger E, Fiala M, McNeill G, Williams W. SMRM, August 17-26, 1990.
10. Magnetic Resonance Imaging in Patients with Kaposi's Sarcoma Associated with Acquired Immunodeficiency Syndrome. Elam E, Witte M, Unger E, Fiala M, McNeill G, Williams W. RSNA, November 25-30, 1990.
11. Gadolinium Enhanced MR Imaging of Musculoskeletal Disease. Fondreist J, Unger E, Granstrom P, Lund P, Pitt M, Darkazanli A. SMRI, April 13-17, 1991.
12. Clearance of Liposomal Gadolinium Complexes: In Vivo Decomplexation Studies. Fritz TA, Unger EC, New T, Kulik B, et al. SMRM Tenth Annual Meeting, August 10-16, 1991.
13. Nanogels: Novel Paramagnetic Particulate MR Contrast Agents. Unger EC, Shen DK, Fritz TA, et al. SMRM, August 8-14, 1992.
14. Copolymeric Magnetic Resonance Contrast Agents. Unger EC, Shen DK, Fritz TA, et al. SMRM, August 8-14, 1992.
15. Hydroxyethyl Starch-Ferrioxamine: A Potential MR Contrast Agent for Diagnosis for Hepatic Metastasis. B. Kulik, Fritz TA, Unger EC, Halloway P, Dragsten P, Hedlund B. SMRM, August 8-14, 1992.
16. Percutaneous Ethanol Ablation of Liver Tumors. Unger E, Kartchner Z, Karmann S, Modiano M, Villar H, Hersh E, Jarrell B. Faculty Science Fair, Tucson, AZ, March 4, 1993.
17. The Use of Gd-DTPA to Improve Lesion Visibility in Ultrasound Surgery. Darkazanli A, Hynynen K, Unger E, Damianou C, Schenck J. SMRI 11th Annual Meeting, March 27-31, 1993.
18. MR Angiography of the Popliteal Artery; Vascular Compression in Normal Subjects. Baker M, Unger C, Erdoes L, Bernhard V. Society for Magnetic Resonance Imaging, Dallas, TX, March 5-9, 1994.

19. MRI Guided Ultrasonic Surgery. Unger E, Hynynen K, Gmitro A, Alexander A. Faculty Science Fair, Tucson, AZ, April 5, 1994.
20. Optimization of Gradient-Echo Pulse Sequences for Dynamic Imaging of Hyperthermia. Alexander AL, Gmitro AF, Damianou C, Hynynen K, Unger E. Society of Magnetic Resonance, San Francisco, CA, August 7-12, 1994.
21. Lipid Coated Microbubbles as Drug and Gene Delivery Vehicles. Unger E, Matsunaga T, McCreery T. Faculty Science Fair, Tucson, AZ, April 27, 1995.
22. Effect of Toluene on Relaxation and Phase Properties in Model Phospholipid Bilayers via <sup>1</sup>H MRI, <sup>31</sup>P and <sup>2</sup>H MRS. Trouard TP, Alexander AL, Unger EC. Society of Magnetic Resonance, New York, NY, April 27-May 3, 1996.
23. Development of New Laser Guidance System Which Improves Accuracy of Image-Guided Biopsy. Pereles S, Unger E. Faculty Science Fair, Tucson, AZ, May 2, 1996.
24. Unger EC, et al. Synthesis and Characterization of Novel Bioconjugates for Targeted Microbubble Delivery to Vascular Clots, American Association of Pharmaceutical Scientists, Indianapolis, IN, Oct 29-Nov 2, 2000.
25. Unger EC, et al. Synthesis, Characterization, and Calorimetric Studies of a Series of Novel Bioconjugates for the Selective Targeting of Microbubbles to GPIIb/IIIa Receptors on Vascular Thrombi. 2<sup>nd</sup> International Peptide Symposium/17<sup>th</sup> American Peptide Symposium, San Diego, CA, June 9-14, 2001.
26. Unger EC. Microbubbles as Targeted Imaging and Delivery Agents – Emphasis on Gene Delivery. First Annual Meeting of the Society of Molecular Imaging, Boston, MA, August 24, 2002.
27. Unger EC, Sweitzer RH. Gene Delivery Using Microbubbles and Ultrasound. Controlled Release Society Winter Symposium & Eleventh International Symposium on Recent Advances in Drug Delivery Systems. Salt Lake City, UT, March 3-6, 2003.
28. Unger EC, Zutshi R, et al. Novel Diagnosis and Treatment of Prostate Cancer using Ultrasound and Targeted-Delivery Systems. Therapeutic Targeting of Human Prostate Cancer Symposium. AZ Cancer Center, Tucson, AZ, May 6-9, 2004.
29. Unger EC, Zutshi R, et al. Ultrasound-Mediated SonoLysis using Microbubbles. Institute for Biomedical Science and Biotechnology, University of Arizona, Tucson, AZ.
30. Xie Feng; Unger, EC; Recanalization of Occluded Arteriovenous Grafts with Diagnostic Ultrasound and Intravenous Microbubbles; 17<sup>th</sup> Annual Scientific Sessions of the American Society of Echocardiography (ASE), Baltimore, Maryland, June 3-7, 2006.
31. Unger E. NuvOx Pharma. NHLBI Regional Innovation Conference, San Francisco, CA September 10, 2013.
32. Unger E, Wilson D, Lickliter J. Multidose Oxygen Therapeutic for Radiation Sensitization of Glioblastoma Multiforme. American Society of Clinical Oncology, Chicago, Illinois, May 30<sup>th</sup> to June 3<sup>rd</sup>, 2014.
33. Lickliter J, Ruben J, Wilson D, Zhou H, Mason R, Unger E. Phase Ib/II Clinical Trial of Novel Oxygen Therapeutic in Chemoradiation of Glioblastoma. Presented at the Radiologic Society of North America, Chicago, Illinois, November 28<sup>th</sup>, 2016.
34. Unger E, Lickliter J, Ruben J, et al. A phase Ib/II clinical trial of a novel oxygen therapeutic in chemoradiation of glioblastoma. American Society of Clinical Oncology. ASCO Conference, Chicago, Illinois, Presented June 5<sup>th</sup> 2017

#### **WORK IN PROGRESS PRESENTATIONS:**

1. Unger EC, Tilcock CS, MacDougall P. Liposomal Gd-DTPA Enhanced MR Imaging of Hepatic Metastases. RSNA, Chicago, Illinois, November 30, 1988, p. 368 RSNA Scientific Program.

2. Tilcock, CS, Unger EC, Zerella A, Fajardo L. Synthesis and Characterization of Paramagnetic Liposomes as MR Contrast Agents. RSNA, Chicago, Illinois, November 30, 1989.
3. Schumacher DJ, Steinbach G, Keane S, Buxton RB, Unger E, Mattrey RF. Comparison of Artifacts Generated by Oral MRI Contrast Agents in-vitro. 39th Annual Meeting of the Association of University Radiologists, March 17-22, 1991.
4. Schumacher DJ, Steinbach G, Keane SF, Buxton RB, Unger E, Mattrey RF. Which Oral Contrast Agents Generate the Fewest Artifacts? 1991 Annual Meeting of the SMRI.
5. Darkazanli A, Hynynen K, Damianou C, Unger EC, Schenck JF. MRI Guided Ultrasonic Surgery: WIP. Presented at SMRM, Berlin, Germany, August 8-14, 1992.

#### **PUBLICATIONS:**

1. Unger EC, Totty WG, Neufeld DM, et al. Magnetic Resonance Imaging Using Gadolinium Labeled Monoclonal Antibody. IR 1985;20:693-700.
2. Unger EC, Glazer HS, Lee JKT, Ling D. MRI of Extracranial Hematomas: Preliminary Observations. AJR 1986;146:403.
3. Unger EC, Gutierrez F. Ytterbium-DPA: A Potential Intravascular Contrast Agent. Invest Radiol 1986;21:802-807.
4. Unger EC, Gado MH, Fulling KF, et al. Acute Cerebral Infarction in Monkeys: An Experimental Study Using MR Imaging. Radiology 1987;162:789-795.
5. Unger EC, Lee J, Wyman P. CT and MRI of Radiation Hepatitis. JCAT 1987;11:264-268.
6. Gatenby W, Hartz W, Engstrom P, Unger E, et al. CT-guided Laser Therapy in Resistant Human Tumors: Phase I Clinical Trials. Radiology 1987;163:172-175.
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8. "Targeting and Delivery of Drugs with Ultrasound Contrast Agents". Unger EC. In *Trends in Contrast Media*, eds HS Thomsen, RN Muller, RF Mattrey, Springer-Verlag, Berlin Heidelberg, Germany, 1999, pp. 405-412.
9. "Targeted MR Contrast Agents". In *Textbook of Contrast Media*, ed. P. Dawson, D. Cosgrove and D. Allison, Isis Medical Media Ltd., London, England, 1999, pp. 379-407.
10. "Magnetic Resonance Imaging of the Temporomandibular Joint". Unger EC, Wright WH Jr. In *Neuroimaging: Clinical and Physical Principles*, eds. RA Zimmerman, WA Gibby and R Carmody, Springer-Verlag, New York, NY, 2000, pp. 1195-1220.
11. "Thrombus-Specific Contrast Agents for Imaging and Thrombolysis" Unger EC, McCreery T, Matsunaga TO. In *Basic Principles and Clinical Applications*, eds B Goldberg, J Raichler, F Forsberg, Martin Dunitz Ltd, London, England. In press.
12. "Lipid Coated Microbubbles and Nanodroplets as Tools for Biomedical Nanotechnology" Unger EC, Matsunaga TO, In *Materials in Nanomedicine*, Biomedical Nanotechnology, Stanford Publishing, eds M Amiji and V Torchilin
13. Unger EC, and Matsunaga TO "Gene Delivery with Ultrasound and Microbubbles" Unger EC, and Matsunaga TO. INTECH, Non-Viral Gene Therapy, ISBN: 978-953-307-538-9

#### **NON-PEER-REVIEWED JOURNALS:**

1. Unger EC. Clinical Indications for Partial Flip Angle Imaging. Diagnostic Imaging. 1988;10(3):102-107.
2. Unger EC, Darkazanli A, Cohen M. Fast Scanning. Diagnostic Imaging. 1989;November:248-256.
3. Unger EC, Summers TB. Magnetic Resonance Imaging of Bone Marrow. Topics in Magnetic Resonance Imaging. 1989;1(4):31-52.
4. Unger E. Diagnostic Imaging and Image Guided Treatment of Lymphatic Diseases. National Lymphedema Network Newsletter, 1994;6:1(1).
5. Unger E. Understanding the Fundamentals of Magnetic Resonance Imaging and Computed Tomography. Clinical Research News for AZ Physicians, 1995;6(6).
6. Bellon RJ, Wright WH, Unger E. CT Guided Pericardial Drainage and Sclerosis. Vascular/Interventional Update 1995;1(1).
7. Unger EC, Romanowski M, McCreery TP, Sweitzer RH, Williams JD, Machatha S. Nanoparticle Drug Delivery Systems. The Drug Delivery Companies Report 2001/2002/PharmaVentures.
8. Unger EC, Matsunaga TO, Schumann P, Zutshi R. Molecular Imaging and Other Novel Techniques. Medicamundi (Special edition Molecular Imaging) 2003;47(1).

#### **LETTERS TO THE EDITOR:**

1. Hynynen K, Damianou C, Darkazanli A, Unger E, Schenck JF. The Feasibility of Using MRI to Monitor and Guide Noninvasive Ultrasound Surgery. Ultrasound in Med & Biol 1993;19(1):91-92.
2. Pond GD, Unger EC, Smyth SH, Kartchner Z. Letter to the Editor. Technical Failures in CT Arterial Portography. AJR 1993;161(July):209-210.
3. Özgür HT, Unger EC, Wright WH Jr. Letter to the Editor. Portal venous gas in a cardiac transplant patient. AJR 1996;166(4):992-993.

## **CONTINUING MEDICAL EDUCATION CREDITS:**

(Required by the State of AZ)

- 11/1989 RSNA Annual Meeting, Chicago, Category 1: 17.5 credit hours
- 02/1990 Tucson, AZ, Category 1: 25 credit hours
- 02/1990 Kauai, HI, Category 1: 25 credit hours
- 02/1990 "Imaging the head, spine and musculoskeletal system", Category 1: 25 credit hours
- 07/1990 Society of Magnetic Resonance in Medicine Annual Meeting, New York, 47 credit hours
- 11/1990 RSNA Annual Meeting, Chicago, Category 1: 4.25 credit hours
- 11/1990 "Imaging bone and soft tissue masses and MR and CT of the abdomen," Michigan State University: 3 credit hours
- 02/1991 "Imaging the head, spine and musculoskeletal system," Category 1: 25 credit hours
- 02/1991 AIUM Annual Convention, Atlanta, Category 1: 18 credit hours
- 08/1991 "Sharper Imaging in MRI," Whistler, BC, Category 1: 25 credit hours
- 02/1992 "MRI Update 1992," Tucson, AZ, Category 1: 25 credit hours
- 02/1992 "Practical Radiology," Tucson, AZ, Category 1: 18.5 credit hours
- 02/1992 "MR angiography & imaging of the head, spine & musculoskeletal system, Category 1: 25 credit hours
- 03/1992 "MRI Workshop in Hawaii," Wailea, Maui, HA, Category 1: 30 credit hours
- 03/1992 36th Annual AIUM Convention, San Diego, Category 1: 2.5 credit hours
- 12/1992 RSNA 78th Scientific Assembly & Annual Meeting, Chicago, IL, Category 1: 10.20 credit hours
- 02/1993 Practical Radiology, Tucson, AZ. Category 1: 18.5 credit hours
- 03/1993 SMRI 11th Annual Meeting, San Francisco, CA. Category 1: 13.75 credit hours
- 09/1993 14th International Congress of Lymphology, Washington, DC. Category 1: 15 credit hours
- 12/1993 RSNA 79th Scientific Assembly & Annual Meeting, Chicago, IL, Category 1: 14.5 credit hours
- 03/1994 SMR 1st Meeting, Dallas, TX, Category 1: 9.75 credit hours
- 10/1994 Lymphstasis a decade of progress. Stanford University/National Lymphedema Network, Stanford, CA, Category 1: 14.75 credit hours
- 12/1994 RSNA 80th Scientific Assembly & Annual Meeting, Chicago, IL, Category 1: 8.5 credit hours
- 03/1995 AIUM 39th Annual Convention, San Francisco, CA, Category 1: 1.5 credit hours
- 05/1995 Symposium on Contrast Agents in Ultrasound, Atlantic City, NJ, Category 1: 7.5 credit hours
- 11/1995 RSNA 81st Scientific Assenbly & Annual Meeting, Chicago, IL, Category 1: 6.5 credit hours
- 02/1996 Spiral CT in Clinical Practice, Vail, CO, Category 1: 16 credit hours
- 03/1996 Practical Radiology & Fundamental Intervention, San Carlos, Mexico, Category 1: 10 credit hours
- 05/1996 2nd International Conference on Contrast Ultrasound, Hammersmith Hospital, London, England, Category 1: 6 credit hours (approved by The Royal College of Radiologists)
- 05/1996 Contrast Agents in Ultrasound, Atlantic City, NJ, Category 1: 7.5 credit hours
- 09/1996 Spiral/Helical CT National Symposium, New York, NY, Category 1: 15 credit hours
- 12/1996 RSNA 82nd Scientific Assembly & Annual Meeting, Chicago, IL, Category 1: 9.5, category 2: 1 credit hour
- 02/1997 AZ Desert Radiology Society, Scottsdale, AZ, Category 1: 3 credit hours
- 02/1997 Spiral CT in Clinical Practice, Aspen, CO, Category 1: 6 credit hours
- 03/1997 AIUM, San Diego, CA, Category 1: 1.5 credit hours
- 11/1997 Society of Cardiovascular Magnetic Resonance-Cardiac MRI: Impact in CD, Orlando, FL, Category 1: 4.5 credit hours
- 12/1997 RSNA 83rd Scientific Assembly & Annual Meeting, Chicago, IL, Category 1: 9.5 credit hours
- 09/1998 13<sup>th</sup> Annual Advances in Echocardiography: Contrast Echocardiography and Perfusion Imaging, Chicago, IL, Category 1: 12 credit hours
- 10/1998 Bubbles in Radiology – The State of the Art, Toronto, Canada, Category 1: 13.0 credit hours
- 12/1998 RSNA 84<sup>th</sup> Scientific Assembly & Annual Meeting, Chicago, IL, Category 1: 7 hours, category 2: 1 hour of credit
  
- 03/1999 Current Therapy for Diagnosis and Treatment of Iliofemoral Deep Venous Thrombosis, Tucson, AZ. Category 1: 1 hour of credit
- 12/1999 RSNA Cardiovascular (Hemodialysis Access: Venous): 1.5 credit hours
- 12/1999 RSNA Categorical Course in Diagnostic Radiology: Body MR – Cardiac, Aorta, Renal and Mesenteric, Peripheral Vasculature: 1.5 credit hours
- 12/1999 RSNA Categorical Course in Diagnostic Radiology: Body MR – Chest, Breast, MR: 1.5 credit hours
- 12/1999 RSNA Categorical Course in Diagnostic Radiology: Body MR – Female and Male Pelvis: 1.5 credit hours
- 12/1999 RSNA Neuroradiology (Spinal Imaging and Intervention): 1 credit hour
- 12/1999 RSNA Physics (US and General Medical Physics): 1.5 credit hours
- 12/1999 RSNA Scientific Exhibits, Category II: 2 credit hours
- 10/2000 Bubbles in Radiology – The State of the Art, Toronto, Canada. Category 1: 14 credit hours

03/2001 AIUM, Orlando, FL, Category 1: 9 credit hours

2001 Review of Radiology Manuscripts, 6 credit hours

11/2001 RSNA 87<sup>th</sup> Scientific Assembly & Annual Meeting, Chicago, IL, Category 1: 21 hours, Category 2: 1 hour

12/2001 Radiology Manuscript Review (01-1010), Tucson, AZ: 2 credit hours

12/2001 Radiology Manuscript Review (01-1396), Tucson, AZ: 2 credit hours

12/2001 Radiology Manuscript Review (01-1429), Tucson, AZ: 2 credit hours

12/2001 Radiology Manuscript Review (01-1751), Tucson, AZ: 2 credit hours

12/2001 Radiology Manuscript Review (01-1931), Tucson, AZ: 2 credit hours

03/2002 AIUM 46<sup>th</sup> Annual Convention, Nashville, TN, Category : 1.5 credit hours

03/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

04/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

04/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

04/2003 Radiology Morbidity & Mortality Conference, Tucson, AZ, Category 1: 1 credit hour

04/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

08/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

09/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

10/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

10/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

11/2003 Radiology Resident Case Review, Tucson, AZ, Category 1: 1 credit hour

12/2003 RSNA Annual Oration in Radiation Oncology: The Invaluable Role of PET in Radiation Oncology: 1.25 credit hours

12/2003 RSNA Eugene P. Pendergrass New Horizons Lecture: The NIH Vision: 1.25 credit hours

12/2003 RSNA Gastrointestinal Gastric Cancer: Multi-Detector Row CT: 1.5 credit hours

12/2003 RSNA Gastrointestinal/Ultrasound Focal Liver Lesions II: 1 credit hour

12/2003 RSNA Head and Neck Cancer: 1.5 credit hours

12/2003 RSNA MR Spectroscopy in Oncologic Imaging: 1.5 credit hours

12/2003 RSNA Oncodiagnosis Panel: GI Tumors: 1.5 credit hours

12/2003 RSNA Physics CAD IV: Skeletal, Liver: 1 credit hour

12/2003 RSNA 89<sup>th</sup> Scientific Assembly & Annual Meeting, Oak Brook, IL, Category 1: 10.50 credit hours

01/2004 Radiology Visiting Professor Conference, Tucson, AZ, Category 1: 1 credit hour

02/2005 International Stroke Conference 2005, New Orleans, LA, Category 1: 21.75 credit hours

09/2005 *Radiology* Manuscript Review, Tucson, AZ, Category 1: 1 credit hour

09/2005 *Radiology* Manuscript Review, Tucson, AZ, Category 1: 1 credit hour

01/2006 UCSD Neuroradiology at Snowbird, Utah, AMA Category 1: 20 credit hours

03/2006 AIUM 2006 Annual Pre-Convention Program & Convention, Washington, DC, Category 1:10.5 credit hours

05/2006 *Radiology* Manuscript Review (RAD-06-0499), Tucson, AZ, Category 1: 2 credit hours

05/2006 *Radiology* Manuscript Review (RAD-06-0786), Tucson, AZ, Category 1: 2 credit hours

06/2006 *Radiology* Manuscript Review (RAD-06-0928), Tucson, AZ, Category 1: 3 credit hours

03/2007 Society of Interventional Radiology and Convention, Seattle, WA, AMA Category 1: 19.5 credit hours

11/2007 Radiological Society of North America, Chicago, IL., AMA Category 1: 3.0 credit hours

05/2008 Leading Edge in Diagnostic Ultrasound Annual Conference, Atlantic City, NJ, Category 1: 24.25 credit hours

08/2008 European Society of Cardiology Congress 2008, Munich, Germany, European Board for Accreditation in Cardiology, 18.0 external CME credits

09/2008 23<sup>rd</sup> Annual Advances in Contrast Ultrasound: Enhanced Atherosclerosis Imaging and Interventions/Bubble Course, Chicago, IL, Category 1: 11.0 credit hours.

11/2008 Radiological Society of North America, Chicago, IL, Category 1: 12.25 credit hours

04/2009 Society of Ultrasound in Medicine, New York, New York, AMA Category 1: 12.0 credit hours

05/2009 Cardiac CTA Three Day Training Course, Tucson, AZ, Review of 100 cardiac CT cases

10/2009 Advances in Contrast Ultrasound – ICUS Bubble Course 2009, AMA Category 1: 12.0 credit hours

12/2009 Radiological Society of North America, Chicago, Illinois, Category 1: 16.0 credit hours

09/2010 World Molecular Imaging Congress, Kyoto, Japan, AMA Category 1: 15.0 credit hours

10/2010 Advances in Contrast Ultrasound – ICUS Bubble Course 2009, AMA Category 1: 12.0 credit hours

11/2010 Radiological Society of North America, Chicago, Illinois, Case-based Review of Nuclear Medicine PET/CT Workshop, , AMA Category 1: 24.5 credit hours

1/28/2013 American Institute of Ultrasound in Medicine, Journal of Ultrasound in Medicine, review, 3 AMA Category 1: credit hours.

6/17/2013 Radiological Society of North America, Radiology Journal, review, 3 AMA Category 1 Credits

6/8 to 6/10/2013 Society of Nuclear Medicine, Vancouver, Canada, 10.5 AMA Category 1 units.

10/3 to 10/4/2013 International Contrast Ultrasound Society, Chicago, IL, 12.0 AMA Category 1 Credits.

11/30 to 12/5/2013 Radiological Society of North America, Chicago, Illinois, AMA Category 1: credit hours



- 4/5/2014 Radiological Society of North America, Review of Radiology Manuscripts, 3 AMA PRA Category 1 Credits
- 4/30/2014 Radiological Society of North America, Review of Radiology Manuscripts, 3 AMA PRA Category 1 Credits
- 6/16/2014 Documenting in ICD-10-CM, 0.50 AMA PRA Category 1 Credit(s)
- 6/16/2014 Documenting in ICD-10-CM, West Virginia Board of Registered Professional Nurses, Provider Number WV2013-05797RN for 1.20 contact hours
- 6/17/2014 Radiological Society of North America, Review of Radiology Manuscripts, 3 AMA PRA Category 1 Credits
- 6/1 to 6/3/2014 American Society of Clinical Oncology, Annual Meeting, Chicago, IL, 19.75 AMA PRA Category 1 Credits
- 9/17 to 9/19/2014 International Contrast Ultrasound Society, Chicago, IL, 13.5 AMA Category 1 Credits.
- 10/31/2014 Radiological Society of North America, Review of Radiology Manuscripts, 3 AMA PRA Category 1 Credits
- 11/30/2014 Radiological Society of North America 100th Scientific Assembly and Annual Meeting, Chicago, IL, 16.50 AMA PRA Category 1 Credits
- 1/5/15 Radiological Society of North America, Review of Radiology Manuscripts, 3 AMA PRA Category 1 Credits
- 1/5/15 Radiological Society of North America, Review of Radiology Manuscripts, 3 AMA PRA Category 1 Credits
- 3/30/15 Radiological Society of North America, Review of Radiology Manuscripts, 3 AMA PRA Category 1 Credits