

Curriculum Vitae
SEAN MACKEY, M.D.,PH.D.

Office Address:

Department of Anesthesiology
Division of Pain Management
Stanford University School of Medicine
780 Welch Road #208
Palo Alto, CA 94304
smackey@stanford.edu
<http://snapl.stanford.edu>
<http://paincenter.stanford.edu>

Admin. Contact:

Andrew Morrow
amorow@stanford.edu
650.725.9636

EDUCATION

M.D., University of Arizona, College of Medicine,
Tucson, Arizona, May 1994

Ph.D., University of Arizona, School of Electrical and Computer Engineering
Tucson Arizona, December 1994
Major: Electrical and Computer Engineering
Minor: Physiology

M.S.E., University of Pennsylvania, School of Engineering and Computer Science
Philadelphia, Pennsylvania, December 1986
Major: Bioengineering
Minor: Electrical Engineering

B.S.E., University of Pennsylvania, School of Engineering and Computer Science
Philadelphia, Pennsylvania, May 1986
Major: Bioengineering
Minor: Electrical Engineering

POSTDOCTORAL TRAINING

Fellowship – Pain Management, Department of Anesthesiology, Stanford University Medical Center
Stanford, California, June 1999

Chief Resident, Department of Anesthesiology, Stanford University Medical Center, 1997-98,

Residency – Department of Anesthesiology, Stanford University Medical Center
Stanford, California, June 1998

Internship – Tucson Hospitals Medical Education Program
Tucson, Arizona, 1995

ACADEMIC APPOINTMENTS

Associate Professor Departments of Anesthesiology, Division of Pain Management and Neurosciences, Stanford University, Stanford, California, November 2007 – Present

Assistant Professor Departments of Anesthesiology, Division of Pain Management and Neurosciences, Stanford University, Stanford, California, July 1999 – 2007

Director - Regional Anesthesia Services, Stanford University Department of Anesthesia, Stanford, California, February 2000 -- 2006

Co-Director – Stanford Pain Research and Clinical Center (SPARCC) – January 2004 – Present

Associate Director – Pain Management Division, Stanford University Department of Anesthesia, Stanford, California, March 2004 – August 2007

Director – Stanford Systems Neuroscience and Pain Lab (SNAPL) – January 2002 – Present

Chief – Pain Management Division, Stanford University Department of Anesthesia, Stanford, California, September 2007 – Present

ONGOING RESEARCH SUPPORT (GRANTS AND CONTRACTS)

R01 NS053961 PI: Mackey 1/9/06 – 12/31/10 (Priority Score 138 – 3.4%)
fMRI of Pain in the Human Spinal Cord Direct Costs - \$218k/year

The major goal of this project is to utilize fMRI techniques to characterize neural plasticity and the processing of nociception in the human spinal cord.

R21 DA026092 PI: Mackey Direct Costs - \$325K/year 5/15/09 – 4/30/11
Learned Control of Frontal and Limbic Systems via Real-Time fMRI

K99 DA023609 PI: Jarred Younger (postdoc in lab) Mentor & Co-Investigator: Mackey
Direct Costs - \$87K/year 9/30/07 – 8/31/09

Mechanisms of Opioid-Induced Hyperalgesia in Pain Patients: Examination via fMRI

K99/R00. The major goal of the this project is to characterize the central neural correlates of opioid induced hyperalgesia in chronic pain patients consuming chronic opioids.

K23 DA25152 PI: Ian Carroll, Mentor & Co-Investigator: Mackey
Direct Costs \$165K/year 9/1/08 – 8/31/13
Prescription Opioid Use, Misuse, and Pain in Post-Surgical Patients

U01 DK082316 Consortium PI: Mackey (Subcontract via Univ. Pennsylvania)
Direct Costs \$175K/year 9/15/08 – 6/30/09
Central Mechanisms of Urologic Pelvic Pain: Functional and Structural Analysis by MRI

Eli Lilly Investigator Initiated Grant – PI: Mackey 12/6/06 – 1/22/08 Direct Costs \$98k
Duloxetine: Functional MRI Neural Correlates of Efficacy in Patients with Chronic Low Back Pain

The major goal of this project is to characterize the effects of duloxetine, a balanced norepinephrine and serotonin reuptake inhibitor, on patients with chronic low back pain. This will utilize validated outcome measures and fMRI techniques.

Dodie and John Rosekrans Pain Research Endowment Fund (Director: Sean Mackey)

2001 – forever \$1.6million

This endowment is used to support projects related to functional neuroimaging of pain processing and perception. The primary project is: *Functional MRI in Patients with Chronic Pain: Effects of a Cognitive Behavioral Therapy Program*

The goals of this project are to: (1) Develop functional magnetic resonance imaging (fMRI) protocols to assess brain activation during the experience of pain and while patients attempt to cognitively control their pain response. (2) Identify pre vs. post-cognitive behavioral therapy patterns of change in brain activation that may be used to discriminate those who do and do not benefit from this form of therapeutic intervention

Cognitive Neurosciences Grant-Clark Center for Bioengineering (Co-Invest.) 2000 - Present
Advanced Imaging Techniques Applied to Pain Research – Functional Magnetic Imaging of the Human Spinal Cord and Brain

The goals of this project are to develop psychophysical tools to be used in the Magnetic Resonance Imaging facility to support ongoing studies into the neural circuitry responsible for pain processing.

Department of Anesthesiology Research Grant (PI: Mackey) 1999-2007

Development of a Human Neuropathic Pain Model and Determination of Effects of Intravenous Lidocaine on the Sensory and Affective Components of Pain

The goals are (1) to develop a validated human model to investigate human neuropathic pain using quantitative sensory testing techniques; (2) test this model on the sensory and affective components of neuropathic pain using an intravenous membrane stabilizing agent; and (3) correlate the response of the model with long term treatment outcomes utilizing a validated chronic pain outcome tool.

American Fibromyalgia Syndrome Association (PI: Mackey) 1/1/08 – 1/1/09

Low-Dose Naltrexone in the Treatment of Fibromyalgia

NIH Loan Repayment Program (PI: Younger, Mentor: Mackey) Direct Costs - \$25k/year

COMPLETED RESEARCH SUPPORT

5 R44 NS050642-04 PI: deCharms, Consortium PI: Mackey 06/25/04 – 07/31/07 Direct Costs \$310k
Omneuron Inc (Prime: NIH NINDS)

Applications of Real Time fMRI-Phase II

The major goal of this project is to develop novel computational technologies and methods to control cognitive and behavioral training tasks using information from real time functional magnetic resonance imaging.

SBIR Phase II Fast Track Contract: Virtual Reality and Real Time fMRI

PI: deCharms, Consortium PI: Mackey 1/18/05 – 01/18/07

Omneuron Inc (Prime: NIH)

The major goal of this project is to use a combination of virtual reality and real time fMRI to significantly enhance a patient's ability to control activation in brain areas related to pain regulation.

Arthritis Foundation – Fellowship Grant (PI – Younger, Mentor – Mackey) 2006-2007
Direct Costs \$50k/yr

Foundation for Anesthesia Education and Research – Research Starter Grant 2004 - 2006
Imaging Neural Systems in Complex Regional Pain Syndrome

The aim of this proposal is to investigate abnormalities of neuronal function in brain regions associated with pain processing in patients with CRPS using functional magnetic resonance imaging. We will study brain responses in a cohort of patients with CRPS induced by noxious stimuli. The study group will be compared to healthy matched control subjects. Finally, subjects and patients will be studied with respect to their ability to attend away from a varying noxious thermal stimulus using a working memory model of attention.

Foundation for Anesthesia Education and Research – Mentored Research Training Grant
(PI: Ian Carroll, Mentor: Mackey) 1/1/07 – 8/31/08
Mechanisms of Analgesic Response During IV Lidocaine Infusion in Neuropathic Pain Patients

5R43MH067290-02 NIMH

Applications of Real Time fMRI (PI: deCharms) (Co-Investigator Mackey) 12/20/02-11/30/04

The major goal of this project is to develop novel computational technologies and methods to control cognitive and behavioral training tasks using information from real time functional magnetic resonance imaging (fMRI).

Stanford Office of Technology Licensing Grant (PI-Sean Mackey) 2001-2004

Processing of Pain in the Human Central Nervous System: Analysis through Functional Magnetic Resonance Imaging

The goal is to use functional magnetic resonance imaging to elucidate the processes underlying pain processing in the trigeminal nucleus, and spinal cord

Oxnard Foundation Grant (PI – Sean Mackey) 2001 - 2004

Use of NMDA-Antagonists and Opiates in the Treatment of Fibromyalgia Using Validated Outcome Measurements and Functional Magnetic Resonance Imaging

The goals of this project are to (1) investigate the neural processing of the perception of pain in patients with fibromyalgia compared to healthy volunteers (2) determine the effects of NMDA-antagonists and opiates on quality of life, function and subjective pain experience using validated outcomes tools and fMRI

Department of Anesthesiology Research Grant (PI- Sean Mackey) 1999-2003

Interventional Magnetic Resonance Imaging Applied to Regional Anesthesia and Pain Medicine

The goal is to utilize the Stanford open MRI system to develop improved interventional techniques in pain medicine and regional anesthesia as well as to study the functional (i.e. blood flow, temperature, tissue oxygenation) changes that occur following these procedures.

NIH Short-Term Research Fellowship (PI – Sean Mackey) 1989, 1990, 1994

Optimal Control of Transvenous Catheter Ablation in the Treatment of Tachyarrhythmias

The major goals of this project were to: determine the optimal delivery parameters for delivery of radiofrequency energy, apply computer modeling techniques to predict the effects of ablation energy

on the myocardium, characterize energy losses in delivery system, and determine temperatures within myocardium during ablation.

Alpha Omega Alpha Honor Society Research Fellowship (PI – Sean Mackey) 1991-92
Transvenous Catheter Delivery of Electrical Energy to Ablate Arrhythmogenic Tissue in Patients with Tachyarrhythmias

The major goal of this project was to develop techniques and tools to reliably deliver radio-frequency energy to the myocardium to ablate cardiac arrhythmias

American Heart Association Fellowship (PI – Sean Mackey) 1990-91
Characterization and Optimization of Radiofrequency Catheter Ablation for the Treatment of Cardiac Arrhythmias

The major goal of this project was to develop numerical models to predict and control the effects of radio-frequency energy on the human myocardium for the treatment of cardiac arrhythmias

American College of Cardiology Research Grant (PI – Sean Mackey) 1994
Electrical and Thermal Characterization of Radiofrequency Catheter Ablation

The goal of this project was to characterize the electrical and thermal effects of radio-frequency energy on the human and canine myocardium for the treatment of cardiac arrhythmias

OTHER GRANT SUPPORT

New Allergan Grant/Gift, 2008

Stanford Med Scholars Grant, 2006

Grant to support Stanford medical student, Andrea Crowell, to perform research in our lab

Allergan Educational Grant, 2005

The major goal of this grant is to develop web based pain management educational materials for community physicians

American Heart Association Medical Student Fellowship, 2005

AHA grant to foster research for David Ludlow in the area of: The Effects of Botulinum Toxin in Lumbar Sympathetic Blocks for the Treatment of Peripheral Arterial Disease

VPUE Stanford Faculty Grants for Undergraduate Research, 2002-2003, 2006

The major goal of this grant was to provide funding support for Stanford University undergraduate students to work in my lab investigating pain processing using functional MRI techniques

Glaxo Welcome Educational Grant, 1999

The major goal of this grant is to develop internet/intranet based resources to aid medical students, residents, faculty and staff in the Stanford University Department of Anesthesia

Study Section Reviewer

Canada Institutes of Health Research, Medical Research Council

SCHOLARSHIPS/AWARDS

Mildred P. Coitner Academic Scholarship, 1981-83

GTE Electrical Engineering Scholarship, 1987
Yuma Friends of Arizona Health Sciences Center Young Investigator Award, 1992
Yuma Friends of Arizona Health Sciences Center Young Investigator Award, 1994
American Federation for Clinical Research Medical Student Award, 1994
University of Arizona MD/PhD Academic Scholarship, 1994
Van Winkle Award for Excellence in Surgical Research, 1994
Upjohn Medical Student Research Superstar Award, 1994
1st Place Medical Student Research Competition, AHSC, 1994
Honors and Awards Committee Research Award, AHSC, 1994
Top Doctors in America published in "Guide to Top Doctors" 2002, 2004, 2005
Top Anesthesiologists in America published in "Guide to Top Doctors" 2006
Stanford Department of Anesthesia, Teacher of the Month, March 2003
Stanford Department of Anesthesia Research Award (awarded to trainees in my lab), 2003, 2004, 2005, 2006
American Pain Society Clinical Center of Excellence Award, 2008

PATENTS

Mackey, S. "Radio Frequency Energy Delivery System for Multipolar Electrode Catheters",
USO5837001 Issued 11/17/1998
Mackey, S., Carroll, I, Clarke, D "Toxin Induced Sympathectomy" Applied America and PTC
1/2004

PhD Dissertation

1. **Mackey, S.** A Thermodynamic Model of Radiofrequency Catheter Ablation for the Treatment of Cardiac Arrhythmias, Ph.D. Dissertation, University of Arizona, Department of Electrical and Computer Engineering, December 1994.

PUBLICATIONS – PEER REVIEWED

1. Simmons, W.N., **Mackey, S.**, He, D.S., Marcus, F.I., *Comparison of Gold Versus Platinum Electrodes on Myocardial Lesion Size Using Radiofrequency Energy*. Pacing and Clinical Electrophysiology, April 1996; 19: 398-402.
2. **Mackey S**, Thornton L, He DS, Marcus FI, Lampe LF, *Simultaneous Multipolar Radiofrequency Ablation in the Monopolar Mode Increases Lesion Size*. Pacing and Clinical Electrophysiology, July 1996;19:1042-1048.
3. Macario, A., **Mackey, S.**, Terris, D., *Bilateral Vocal Cord Paralysis After Radical Cystectomy in a Patient with a History of Bulbar Polio*. Anesthesia and Analgesia, 1997 Nov;85(5):1171-2
4. Angst, M.S., **Mackey, S.**, Zupfer, G., Taturu, C., Brock-Utne, J.G., *Reduction of Propofol Injection Pain with a Double Lumen IV-Set*. Journal of Clinical Anesthesia, September 1997, 9:462-66
5. Brodsky, JB, **Mackey, S.**, *Isolation Techniques – Advances in Thoracic Anesthesia and Postoperative Care*. Seminars in Cardiothoracic and Vascular Anesthesia, September 1997, 1:3;225-35

6. Brodsky, J.B., **Mackey, S.**, Cannon, W.B. *Selecting the Correct Size Left Double-Lumen Tube.* J Cardiothorac Vasc Anesth, 1997 Dec;11(7):924-5
7. **Mackey, S.**, Brodsky, JB., *Selection and Placement of the Double-Lumen Tube in the Asian Patient.* Asian Cardiovascular & Thoracic Annals 1998, Vol. 6, No. 3; 199-202.
8. Leong, M., **Mackey, S.** *Delayed Subdural Anesthesia After Stellate Ganglion Block.* Anesthesiology, February 2001, 94(2); 358-59
9. Sze, D., **Mackey, S.** *MR-Guidance of Sympathetic Nerve Blockade: Measurement of Vasomotor Response - Initial Experience in Seven Patients.* Radiology 2002 223: 574-580
10. **Mackey S.** *Mechanisms of Inflammatory Pain: Therapeutic Implications.* Journal of Clinical Rheumatology, June 2004, Vol. 10, Issue 3S: S5-11
11. **Mackey S.**, Maeda F, *Functional Imaging and the Neural Systems of Chronic Pain.* Neurosurgery North American Clinics of North America, July 2004, Vol. 15, No. 3; 269-288
12. Ochsner K., Knierim K., Ludlow D., Hanelin J., Ramachandran T., Glover G., **Mackey S.** *Reflecting Upon Feelings: An fMRI Study of Neural Systems Supporting the Attribution of Emotion to Self and Other.* Journal of Cognitive Neuroscience, December 2004, 16:10; 1746-1772
13. Shinaman RC, **Mackey S.** *Continuous Peripheral Nerve Blocks.* Current Pain and Headache Reports, 2005, 9, 24-29
14. deCharms C, Maeda F, Glover G, Ludlow D, Pauly J, Soneji D, Gabrieli J, **Mackey S.** *Control Over Brain Activation and Pain Learned by Using Real-Time Functional MRI.* PNAS, December 2005, 102:51; 18626-31
15. Ochsner K, Ludlow D, Knierim K, Hanelin J, Ramachandran T, Glover G, **Mackey S.** *Neural Correlates of Individual Differences in Pain-Related Fear and Anxiety.* Pain, January 2006, 120:69-77
16. **Mackey S.**, Feinberg S, *Pharmacologic Therapies for Complex Regional Pain Syndrome.* Current Pain and Headache Reports, February 2007, 11:1; 38-43
17. Mitra R, Zeighami A, **Mackey S.** *Pulsed radiofrequency for the treatment of chronic ilioinguinal neuropathy.* Hernia, February 2007, 11:4; 369-71
18. **Mackey S.**, Younger J, *Neuroimaging the Central Nervous Components of Neuropathic Pain.* US Neurological Disease, Issue II, January 2007 (epub ahead of print)
19. Kornelsen J, **Mackey S.** *Potential Clinical Applications for Spinal Functional MRI.* Current Pain and Headache Reports, June 2007, 11:3; 165-70
20. Carroll I, **Mackey S.**, Gaeta R, *The role of adrenergic receptors and pain: The good, the bad, and the unknown.* Seminars in Anesthesia and Perioperative Pain, March 2007, 26:1; 17-21

21. Zaki J, Ochsner K, Hanelin J, Wager T, **Mackey S**, *Different circuits for different pain: Patterns of functional connectivity reveal distinct networks for processing pain in self and others.* Interpersonal Sensitivity: A special issue of Social Neuroscience, September 2007, 2:3-4; 276-91, Psychology Press.
22. Carroll I, Gaeta R, **Mackey S**, *Multivariate Analysis of Chronic Pain Patients Undergoing Lidocaine Infusions: Increasing Pain Severity and Advancing Age Predict Likelihood of Clinically Meaningful Analgesia.* Clinical Journal of Pain, October 2007, 23:8; 702-6
23. Carroll I, Kaplan K, **Mackey S**, *Mexiletine Therapy for Chronic Pain: Survival Analysis Identifies Factors Predicting Clinical Success.* Journal of Pain and Symptom Management, January 2008, Vol 35:3; 321-6.
24. Ochsner K, Zaki J, Hanelin J, Ludlow D, Knierim K, Ramachandran T, Glover G, **Mackey S**. *Your pain or mine? Common and distinct neural systems supporting the perception of pain in self and other.* Social Cognitive and Affective Neuroscience, 2008, 3:2; 144-60.
25. Godfrey J, **Mackey S**, *Toward optimal health: a discussion on sex, gender, and pain.* Journal of Women's Health, July-August 2008, 17:6; 917-20.
26. Lawrence J, **Mackey S**, *Role of neuroimaging in analgesic drug development.* Drugs in R&D, 2008, 9:5; 323-34.
27. Neugebauer V, Galhardo V, Maione S, **Mackey S**, *Forebrain pain mechanisms.* Brain Research Reviews, 2009, 60; 226-242.
28. Carroll I, Clark D, **Mackey S**, *Sympathetic Block with Botulinum Toxin to Treat Complex Regional Pain Syndrome.* Annals of Neurology, 2009, 65; 348-51.
29. Coleman S, **Mackey S**, *Spinal cord stimulation compared with medical management for failed back surgery syndrome.* Current Pain and Headache Reports, 2009, 13:1; 1-2.
30. Younger J, McCue R, **Mackey S**, *Pain outcomes: A brief review of instruments and techniques.* Current Pain and Headache Reports, 2009, 13:1; 39-43.

PUBLICATIONS – NON-PEER REVIEWED

1. Feinberg, S, **Mackey, S**, Kirz, J, *Symptom Magnification and Waddell's Behavioral Signs*, California Workers Compensation Enquirer, June 2001
2. Feinberg, S, **Mackey, S**, *The Current Opioid Controversy – What is Appropriate Use for Chronic Pain?* (California Workers Compensation Enquirer, 2003)
3. **Mackey, S**, *Perioperative Pain: Novel Approaches to Management in Rethinking the Paradigms of Perioperative Pain Management*, Special Report in Anesthesiology News (Anesthesiology News, 2003)
4. **Mackey, S**, *Pain Management Outcomes – ASA Refresher Course* (October, 2006)

5. Kuritzky L, Samraj G, **Mackey S**, Pain Medicine News, *New Treatments in the Management of Diabetic Peripheral Neuropathic Pain*, September, 2006
6. **Mackey S**, Pathways: Perspectives in Modern Neurology and Pain Management – *Pain and the Brain: Neuroimaging of Pain*, Vol 3, November 2006
7. **Mackey, S**, Pain Management Outcomes – ASA Refresher Course (October, 2007)
8. Younger, J, **Mackey, S**, *Evaluating Outcomes in Pain Medicine*, Current Reviews in Clinical Anesthesia Lesson 11, Vol. 28, December 2007.

Medical Publications (In Preparation)

1. **Mackey S**, Ludlow D, Knierim K, Hanelin J, Glover G, *Human Spinal Cord FMRI Response to Thermal Nociception*, (Submitted to Pain)
2. Younger, J., Ostlund, S., Borckardt, J., Smith, A., Gibert, S., Weinstein, M., Reeves, S., Bodenlos, J., Shaw, D., **Mackey, S**. (submitted). *Paying attention: The role of psychological and somatic awareness in the impact of chronic pain*. The Clinical Journal of Pain
3. **Mackey S**, Shinaman R, Ludlow D, Sawyer-Glover A, Glover G, *Magnetic Resonance Imaging of Pain Transmission in the Human Spinal Cord* (In Preparation)
4. Ochsner K, Ludlow D, Knierim K, Hanelin K, Glover G, **Mackey S** *Do I Feel What You Feel? A Functional Imaging Study of Empathy of Pain*, (submitted)
5. Drover, D, **Mackey S**, *The Pharmacokinetics of Morphine and Morphine-6-Glucoronide (M-6-G) after PCA Infusion* (In Preparation)

Book Chapters and Others

1. Amador, ER, **Mackey, S**. *Peripheral Nerve Blocks and Continuous Catheters in Pain Management, Just the Facts*, Wallace and Staats Eds. May 2004
2. **Mackey, S**. Gaeta, R, *Perioperative Pain Management* in Anesthesiologist's Manual of Surgical Procedures, Jaffe and Samuels (Eds) 3rd Edition 2003
3. **Mackey, S**.– *Low Back Pain: Management Across a Spectrum of Presentations* in Current Issues In Pain Management for the Primary Care Physician Carr and Reuben Eds. December 2004 (<http://www.tuftspainmanagement.org>)
4. **Mackey S**, et al., eds. *Anesthesiology Continuing Education (ACE) Program*. Park Ridge, IL: American Society of Anesthesiologists; 2005: Issue 2B
5. **Mackey S**, et al., eds. *Anesthesiology Continuing Education (ACE) Program*. Park Ridge, IL: American Society of Anesthesiologists; 2006: Issue 3A
6. **Mackey S**, et al., eds. *Anesthesiology Continuing Education (ACE) Program*. Park Ridge, IL: American Society of Anesthesiologists; 2006: Issue 3B

7. Feinberg S, **Mackey S**, *American Chronic Pain Association Chronic Pain Medications Supplement 2008*. Rocklin, CA: American Chronic Pain Association; 2008.

LETTERS TO THE EDITOR

1. Brodsky JB, **Mackey S**, Cannon WB, *Selecting the Correct Size Left Double-Lumen Tube*, J. Card. Anesth. December 1997, 12:46;44
2. Habibi A, **Mackey S**, Brodsky J, *Selecting a Double-Lumen Tube after Lung Transplantation*, Anesthesia and Analgesia 1997;84:1
3. Carroll I, Gaeta R, **Mackey SC**, *A Vaccine to Prevent Herpes Zoster and Postherpetic Neuralgia in Older Adults*, New England Journal of Medicine. September 2005, 353:13;1414-15

Editorial Board

1. Section Editor, Pain and Local Anesthetics, Current Pain and Headache Reports, 2005-present
2. American Society of Anesthesiologists, Anesthesiology Continuing Education, Pain Editor, 2005-present

Journal Reviewer

Anesthesia and Analgesia, Anesthesiology, Pain, Regional Anesthesia and Pain Medicine, Behavioral Neuroscience, European Journal of Pain

ABSTRACTS

1. Cork, R., Behr, S., **Mackey, S.**, DiNardo, J. *Effect of Order of Administration of Amrinone and Dobutamine on Guinea-Pig Heart Muscle*, Anesthesiology, 73:A375, Sept. 1990
2. **Mackey, S.**, Cork, R., Mylrea, K. *An Automated Data Analysis and Collection System for Measuring Isolated Atrial Contractility*, Clinical Research Vol. 41, Pg. 72a, February 1992.
3. **Mackey, S.**, Thornton, L., He, D.H., Marcus, F.I., Mylrea, K. *Cardiac Tissue vs. Blood Impedance as a Measure of Catheter Contact*, Clinical Research 41:344A, 1993.
4. **Mackey, S.**, He, D., Thornton, L., Lampe, L.F., Marcus, F.I. *Delivery of Radiofrequency Energy to All Four Poles of a Catheter Increases Lesion Size*, Circulation 1992;86:Suppl 1:I-784.
5. **Mackey, S.** *A Thermodynamic Model of Myocardial Temperature Distribution During Radiofrequency Catheter Ablation of Cardiac Arrhythmias*, Clinical Research, February, 1994
6. **Mackey, S.**, Lampe, L., Marcus, F.I. *Radiofrequency Power Losses During Catheter Ablation of Cardiac Arrhythmias*, Clinical Research, February, 1994
7. **Mackey, S.**, Thornton, L., He, D., Marcus, F.I. *Frequency Dependent Impedance Measurements: An Indicator of Catheter Contact*, Circulation 88 No. 4:400, 1993.
8. **Mackey, S.**, Lampe, L., Marcus, F.I. *RF Power Losses in the Energy Delivery System During Ablation*, Circulation 1993;88; No. 4:400

9. Simmons WN, **Mackey SC**, He DS, Marcus FI. *Comparison of Maximum Myocardial Lesion Depth Using Radiofrequency Energy Delivered with a Gold or Platinum Electrode.* Circulation 90 No.4 Part 2:1-270, October 1994.
10. **Mackey, S.**, Marcus , F.I. *Tip Temperature is not an Indicator of Myocardial Temperature During Radiofrequency Catheter Ablation.* Pacing and Clinical Electrophysiology 18:801, April 1995
11. He, D., **Mackey, S.**, Marcus, F., Graham, A., Haissaguerra, M., Lampe, L. *Radiofrequency Energy for Cardiac Ablation Using a Multipolar Catheter in Sheep,* Circulation Vol. 92, No 8, October 15, 1995, pg. 1265-66
12. **Mackey S**, Marcus FI. *A Model of Myocardial Temperature Distribution During Catheter Ablation.* American Heart Association Scientific Sessions, November 1995.
13. Taturu C, **Mackey S**, Zupfer G, Angst M, Dyck B, Brock-Utne JG. *Rapid Add Site: A New Double Lumen Extension Set Reduces Pain Caused By Propofol.* Western Anesthesia Residents Conference 34th Annual Conference. University of Arizona Health Sciences, Tucson, Arizona, May 10-12 1996.
14. **Mackey, S.**, Brodsky, J.B., *Choosing a DLT: Is There a Racial Difference in Airway Size?*, Western Anesthesia Residents Conference, March, 1997
15. Tataru C, **Mackey S**, Zupfer G, Angst M, Dyck B, Brock-Utne JG. *Rapid Add Site: A New Double Lumen Extension Set Reduces Pain Caused By Propofol.* Anesth Analg 84:S275, 1997.
16. **Mackey, S.**, Brodsky, J., *Choice and Placement of DLTs in Asian Patients*, October, 1997, American Society of Anesthesiologists Meeting
17. Mora-Mangano, C., **Mackey, S.**, Moseley, M., Mangano, D., *Diffusion-Weighted Magnetic Resonance Imaging: A New Technique to Assess Cerebral Ischemia Following Cardiopulmonary Bypass*, October, 1997 American Society of Anesthesiologists Meeting
18. Marcus FI, Bosnos MJ, He DS, Sharma PP, **Mackey S**. *Comparison of Lesions Generated With Conventional and Thicker Ring Electrodes Using Radiofrequency Energy.* Circulation 1997;Suppl I, 96:I-142:791
19. He DS, Sharma PP, Marcus FI, Bosnos MJ, **Mackey S** *Predictive Parameters of Electrode Tissue Contact In Vivo Prior to and During Radiofrequency Energy Application.* Circulation 1997;Suppl I, 96:I-143:796
20. Sharma PP, He DS, Bosnos MJ, Marcus FI, **Mackey S** *A Comparison of Sequential with Simultaneous Delivery of RF energy Application at Multiple Electrodes to Produce Linear Continuous Lesions..* Circulation 1997;Suppl I, 96:I-576:3220
21. **Mackey, S.**, Sze, D., Gaeta, R., *Magnetic Resonance Therapy Guided Regional Blockade for Pain Management* Anesthesiology September 1999

22. Sze DY, **Mackey SC**, *Nerve Blocks Using Magnetic Resonance Imaging Guidance*. J Vasc Intervent Radiol 12(1 part 2):S13 2001
23. Sze DY, **Mackey SC**, *Changes in Blood Flow after Sympathetic Nerve Block Measured and Guided by MR*, ISMRM 2001
24. Drover DR, **Mackey S**, Schmidt H, Loetsch J. *Morphine and its Metabolites After Routine Post-operative PCA Use*, October, 2002 American Society of Anesthesiologists Meeting
25. **Mackey S**, Ludlow D, Knierim K, Hanelin J, Glover G, *fMRI Activation in the Human Cervical Spinal Cord to Noxious Thermal Stimulation*, Journal of Pain March 2003; 4(2 s1):38.
26. **Mackey S**, Ochsner K, Ludlow D, Knierim K, Hanelin J, Glover G, *Do I Feel What You Feel? A Functional Imaging Study of Empathy of Pain*, Journal of Pain March 2003; 4(2 s1):54
27. Ochsner K, Ludlow D, **Mackey S**, *The role of medial prefrontal cortex in attributions of emotion in self and others*, November 2003, Society for Neuroscience Annual Meeting
28. Maeda F, Soneji D, Ludlow D, Mackey S, Gabrieli J, deCharms C, *Learned Modulation of Brain Activation and Pain Perception Using Real Time fMRI*, April 2004, CNS Meeting
29. **Mackey S**, Maeda F, Soneji D, Ludlow D, Gabrieli J, deCharms C, *Real-time fMRI Directed Modulation of Pain Perception and Brain Activation in Chronic Pain Patients*, May 2004, American Pain Society Meeting
30. Ludlow D, Ochsner K, Knierim K, Hanelin J, Ramachandran T, Glover G, **Mackey S**, *Neural Correlates of Individual Differences in Pain-Related Fear and Anxiety*, May 2004, American Pain Society Meeting
31. Shinaman R, Ludlow D, Glover G, **Mackey S**, *Functional Magnetic Resonance Imaging of Pain Transmission in the Human Spinal Cord*, Presented at Western Anesthesia Research Conference (May 2004) and at California Society of Anesthesiology (Won First Prize – Resident Research – June 2004)
32. Maeda F, Soneji, DJ, **Mackey S**, Ludlow D, Gabrieli G, Pauly JM, deCharms RC, *Learning to Explicitly Control Activation in a Localized Brain Region Through Real Time fMRI Feedback Based Training, with Resulting Impact on Pain Perception*, Society for Neuroscience, October 2004
33. Soneji D, Ueno T, Ludlow D, Kaplan K, Glover G, **Mackey S**, *A Case of CRPS Showing Rapid Reorganization of the Somatosensory Cortex*, American Pain Society Meeting, March 2005
34. Kaplan K, Reynolds P, Robbins W, Gaeta R, Carroll I, Ludlow D, Ueno T, Soneji D, **Mackey S**, *Affect Changes with Intravenous Lidocaine: Part of the Pain Reduction?* American Pain Society Meeting, March 2005
35. Lobato R, Mackey S, *Cluster Analysis of SF-36 Scores in Patients Presenting for Initial Evaluation* American Pain Society Meeting, March 2005

36. Maeda F, Lutomski K, MacLeod S, Soneji D, **Mackey S**, Gabrieli J, Glover G, Pauly J, deCharms C, *Control Over Brain Activation and Pain in Chronic Pain Patients Achieved Through Repetitive Real Time fMRI (rtfMRI) Training*, June 2005, Human Brain Mapping Meeting
37. Ueno T, Soneji D, Ludlow D, Kaplan K, Glover G, **Mackey SC**, *Reorganization of the Somatosensory Cortex in Complex Regional Pain Syndrome*, August 2005, International Association for the Study of Pain Meeting
38. Soneji D, Maeda F, deCharms C, Lutomski K, MacLeod S, Gabrieli J, Glover G, Pauly J, Kaplan K, Mackey S, *Real Time FMRI Augmented Learned Control of Brain Activation and Pain in Chronic Pain Patients: Preliminary Results*, August 2005, International Association for the Study of Pain Meeting
39. Ludlow D, Soneji D, Ueno T, Kaplan K, Palma C, Patil E, Glover G, Sawyer-Glover A, **Mackey S**, *Intensity Encoding of Noxious Thermal Pain in the Human Cervical Spinal Cord*, August 2005, International Association for the Study of Pain Meeting
40. **Mackey S**, Lucca A, Soneji D, Kaplan K, Glover G, *FMRI Evidence of Noxious Thermal Stimuli Encoding in the Human Spinal Cord*, May 2006, American Pain Society Meeting
41. Ueno T, Barad M, Kaplan K, Lucca A, Hoeft F, Soneji D, Muramoto D, Averill C, **Mackey S**, *Posterior Cingulate Cortex Volume Reduction and Correlation with Fear of Pain in Complex Regional Pain Syndrome (CRPS)*, June 2006, Organization for Human Brain Mapping
42. **Mackey S**, Ludlow D, Soneji D, Lucca A, Ueno T, Glover G, *fMRI of the Human Spinal Cord: Encoding of Noxious Thermal Stimuli*, October 2006, Society for Neuroscience
43. **Mackey S**, *Modulation of brain networks via real-time fMRI feedback training*, April 2007, Association of University Anesthesiologists Meeting
44. Watcha D, Brown J, Kornelsen J, Darnauer J, Sarin R, Glover G, **Mackey S**, *Processing of motor, tonic pain, and phasic pain signals in the human spinal cord*, May 2007, American Pain Society Meeting
45. Muramoto D, Younger J, Ueno T, Kirschen M, **Mackey S**, (2007). *Working memory load attenuates moderate pain, but not high pain, in healthy individuals*. *The Journal of Pain*, 8, S18.
46. Crowell A, Younger J, Lobato R, Kaplan K, Carroll I, **Mackey S**, Gaeta R. (2007). *Demographic and psychosocial predictors of disability due to pain*. *The Journal of Pain*, 8, S76.
47. Lucca A, Younger J, Lawrence J, Lutomski K, MacLeod S, Hoeft F, Ueno T, Glover G, Gabrieli J, DeCharms C, **Mackey S**, (2007). *Modulation of brain networks via real-time fMRI feedback training*. *The Journal of Pain*, 8, S15.
48. Mackey A, Crowell A, Carroll I, Younger J, Zulauf M, Kaplan K, Gaeta R, **Mackey S** (2007). *Depressed Mood Predicts Analgesic Response to Intravenous Lidocaine*. *The Journal of Pain*, 8, S36.

49. Brown J, Kornelsen J, Watcha D, Darnauer J, Sarin R, Glover G, **Mackey S**, *The hemodynamic response function in the spinal cord in response to motor and nociceptive stimuli*, May 2007 International Society for Magnetic Resonance in Medicine Meeting
50. Lawrence J, Lucca A, Younger J, Ueno T, Lutomski K, MacLeod S, Hoeft F, Glover G, Gaeta R, deCharms C, **Mackey S**. *Effective connectivity changes associated with learned control over neural activity: A Granger Causality study*. Organization for Human Brain Mapping (OHBM) 13th Annual meeting, Chicago, June 10-14, 2007, 179W-AM.
51. Lawrence J, Hoeft F, Groveman E, Lucca A, deCharms R.C., **Mackey S.C**. *Functional magnetic resonance imaging of pain modulation by cognitive behavioral strategies*. Society for Neuroscience (SFN) 37th Annual meeting, San Diego, November 3-7, 2007.
52. Barad M, Ueno T, Hoeft F, Moulton R, Younger J, Glover G, **Mackey S**. *Voxel based morphometry analysis of patients with chronic neuropathic pain*. American Pain Society (APS) 27th Annual Meeting, Tampa, May 7-11, 2008.
53. Carroll I, Wang J, Wang C, **Mackey S**. *Psychological impairment influences pain duration following surgical injury*. American Pain Society (APS) 27th Annual Meeting, Tampa, May 7-11, 2008.
54. Wang C, Pollard J, Yang G, Humphreys K, Trafton J, Cannon W, Dirbas F, Donnington J, Goodman S, Whyte R, Gillespie M, Wang J, Barelka P, **Mackey S**, Carroll I. *Risk Factors for Delayed Opioid Cessation Following Surgery*. American Pain Society (APS) 27th Annual Meeting, Tampa, May 7-11, 2008.
55. Maeda U, Carroll I, Mackey A, Younger J, **Mackey S**. *Pain Quality Predicts Response to Sodium Channel Blockade with Lidocaine*. American Pain Society (APS) 27th Annual Meeting, Tampa, May 7-11, 2008.
56. Younger J, Parke S, Barelka P, Carroll I, Chu L, Prasad R, Gaeta R, **Mackey S**. *Decrease of Cold Pain Tolerance Following Opioid Detoxification*. American Pain Society (APS) 27th Annual Meeting, Tampa, May 7-11, 2008.
57. Brown J, Kornelsen J, Watcha D, Glover G, **Mackey S**. *Processing of motor, tonic pain and phasic pain signals in the human spinal cord*. International Association for the Study of Pain (IASP) 12th World Congress on Pain, Glasgow, August 16-22, 2008.
58. Prasad R, Younger J, Barelka P, Carroll I, Chu L, Gaeta R, **Mackey S**, Kaplan K. *Opioid Induced Hyperalgesia: Paradoxical Findings in a Chronic Pain*. International Association for the Study of Pain (IASP) 12th World Congress on Pain, Glasgow, August 16-22, 2008.
59. Carroll I, McCue R, Clark D, **Mackey S**. *Lumbar Sympathetic Block with Botulinum Toxin type A for Complex Regional Pain Syndrome*. International Association for the Study of Pain (IASP) 12th World Congress on Pain, Glasgow, August 16-22, 2008.
60. **Mackey S**, Barad M, Ueno T, Greicius M. *Spontaneous Chronic Neuropathic Pain Remodels the Salience Network*. International Association for the Study of Pain (IASP) 12th World Congress on Pain, Glasgow, August 16-22, 2008.

61. Barad M, Ueno T, Hoeft F, Moulton R, Younger J, Glover G, **Mackey S**. *Voxel Based Morphometry analysis of patients with chronic neuropathic pain*. International Association for the Study of Pain (IASP) 12th World Congress on Pain, Glasgow, August 16-22, 2008.
62. Younger J, Aron A, Parke S, **Mackey S**. *Passionate Love Attenuates Acute Pain Via Involvement of Dopaminergic Reward System Pathways*. International Association for the Study of Pain (IASP) 12th World Congress on Pain, Glasgow, August 16-22, 2008.

POPULAR PRESS

1. *Heroin Addiction Drug May Relieve Symptoms of Fibromyalgia* Scientific American April 2009
2. *Addiction Drug May Relieve Fibromyalgia Symptoms* Reuters April 2009
3. *'Life-Changing Benefits' for Patients Using Addiction Drug* The Herald April 2009
4. *Brain Scans of Pain Raise Questions for the Law* Science January 2009
5. *The Placebo Effect at its Simplest is an Effect Produced by Nothing* Stanford Medicine Summer 2008
6. *Just Another Lab Rat* Stanford Medicine Summer 2008
7. *Taking Your Life Back from Pain's Control – with Mind, Body and New Medical Vision* Palo Alto Weekly July 23 2008
8. *Son Finds Hope for Dying Father on Internet* San Francisco Chronicle February 8 2008
9. *A Growing Cadre of Doctors & Scientists Now Believes That Chronic Back Pain is a Disease of the Nervous System, Not the Spine* Best Life Magazine January 21 2008
10. *The Pain Problem* Austin Fit Magazine September 2007
11. *Mind Over Matter, With a Machine's Help* New York Times August 26 2007
12. *Natural Born Pain Killers* Prevention July 2007
13. *Turn Off Your Pain Switch* MSN March 2007
14. *Patients Learn to Use Brain to Beat Pain* KGO-TV February 27 2007
15. *Does Your Head Hurt?* Times Online (UK) December 2 2006
16. *New Findings on Pain Relief.* Consumer Reports on Health September 2006
17. *Placebo's Power Goes Beyond the Mind.* MSNBC August 21 2006

18. *Training Attention.* [MIT Technology Review](#) July 17 2006
19. *Seeing Your Pain.* [MIT Technology Review](#) July 10 2006
20. *My Pain, My Brain.* [New York Times Magazine](#) May 14 2006
21. *MRI Scans Could Help With Controlling Pain.* [WAVY 10](#) February 24 2006
22. *Brain Controls Pain.* [BioX \(China\)](#) February 27 2006
23. *Brain Controls Pain.* [WNEP 16](#) February 17 2006
24. *Findings.* [Harpers](#) February 2006
25. *Brain Over Pain.* [The Boston Globe](#) January 23 2006
26. *Less Brain Pain, Please.* [Times Herald-Record](#) January 11 2006
27. *Patients Can Now See Their Pain.* [NBC 11](#) January 6 2006
28. *Doctor Treats Pain Without Pills.* [NBC Nightly News](#) January 5 2006
29. *Think Away the Pain.* [Wired](#) December 21 2005
30. *Feedback: Relief From Chronic Pain May Be a Thought Away.* [New York Times](#) December 20 2005
31. *Mind-Control Over Pain.* [MIT Technology Review](#) December 19 2005
32. *Viewing Own Brain Scans May Lessen Chronic Pain.* [IndyStar](#) December 18 2005
33. *Brain Training Puts Big Hurt on Intense Pain.* [Science News](#) December 17 2005
34. *People Can Decrease Pain by Observing Their Own Brain Activity.* [Seed](#) December 16 2005
35. *Relief From Pain is All in Your Brain!* [Asian News International](#) December 14 2005
36. *Brain Scans Help Think Away Pain.* [BBC News](#) December 13 2005
37. *Mind Over Matter for Pain?* [ABC News](#) December 12 2005
38. *Patients Reduce Pain by Thinking Like Mr. Spock.* [Telegraph](#) December 13 2005
39. *Interview.* [KCBS](#) December 13 2005
40. *Pain Sufferers Use Brain to Find Relief.* [Forbes](#) December 12 2005
41. *How to Think Your Pain Away.* [UK Times Online](#) December 13 2005
42. *Training the Brain to Reduce Pain.* [WebMD](#) December 12 2005

43. *Science in Action*. [BBC World Service](#) December 16 2005
44. *It's All in Your Head* [Stanford Medicine](#) Fall 2005
45. *Tracking and Controlling Pain by Sight*. [National Public Radio Morning Edition](#) July 6 2005
46. *Pain & Women's Health*. [National Women's Health Report](#) June 2005
47. *Pain May Be in the Brain, But It's Still Real*. [ABC News](#) May 23 2005
48. *Pain Management*. [KQED Health Dialogues](#) May 19 2005
49. *The Fight Against Pain*. [Good Morning America](#) May 9 2005
50. *The Right (and Wrong) Way to Treat Pain*. [Time Magazine](#) February 28 2005
51. *The Pain is in the Brain*. [Stanford University Center Focus](#) Spring 2005
52. *A Closer Look at Pain*. [Stanford University Anesthesia News](#) 2004
53. *Anesthesiologists use groundbreaking technology to visualize pain transmission*. [ASA Annual Meeting News](#) October 25 2004
54. *Your Pain, My Brain*. [Psychology Today](#) July 2003
55. *The Pain Truth*. [Good Housekeeping](#) May 2003
56. *The hardwiring of empathy: When another's pain hurts*. [The Times of India](#) March 30 2003
57. *When You Hurt, My Brain Says I Hurt, Too: Study*. [Reuters Health](#) March 25 2003
58. *America's Riskiest Drugs: Morphine*. [Forbes](#) February 24 2003
59. *Fund Supports Studies of Pain*. [Stanford University Center Focus](#) 2002
60. *High tech method deals with chronic pain*. [WNDU](#) July 30 2001
61. *Pain-Preventing MRIs*. [Penthouse](#) March 2000
62. *Relieving Cancer Pain by Blocking the Flow of Pain Feelings to the Brain*. [Cancerpage.com](#) 2000
63. *New therapy simplifies pain management*. [Biophotonics](#) January 2000
64. *Novel MRI System Facilitates Regional Blockade*. [ASA Annual Meeting News](#) October 9 1999

INTERNATIONAL SYMPOSIUM

1. International Association for the Study of Pain, Chairman and Organizer of Symposium, *Pain and Opiates in the Workplace: Medical, Legal and Practical Issues*, Stanford, California, August 2002

INTERNATIONAL PRESENTATIONS

1. Caracas, Venezuela, Invited Speaker and Regional Anesthesia Workshop Director, September, 2000
Pain Physiology and Pharmacology, Clinical Relevance
Effect on Outcome of Balanced Analgesia
Pain Management for Outpatient Surgery
Workshop – Upper Extremity Regional Anesthesia Blocks
Workshop – Lower Extremity Regional Anesthesia Blocks
2. Northwestern Orthopedics Annual Conference, Keynote Speaker, *Preoperative Management of the Orthopedic Patient*, Vancouver, Canada, March 2001
3. Margarita, Venezuela, Invited Speaker and Regional Anesthesia Workshop Director, September, 2001
Current Concepts in Perioperative Pain Management
Pharmacologic Treatment of Neuropathic Pain
Workshop – Upper Extremity Regional Anesthesia Blocks
Workshop – Lower Extremity Regional Anesthesia Blocks
4. Hamilton, Bermuda, Invited Speaker, International Conference on the Mechanisms and Treatment of Neuropathic Pain, *Changing Pain in the Brain*, November 2006
5. Glasgow, Scotland, European Federation of Neurological Societies, *Pain and the Brain: What has Neuroimaging Taught Us?* October 2006
6. Cozumel, Mexico, Invited Speaker – April, 2007
Functional Neuroimaging of Pain
Neuropathic Pain
What's New in Regional Anesthesia?
Current Concepts of Perioperative Pain
7. Grand Cayman, Invited Speaker, Spring Pain Research Conference, *Prefrontal Cortical Connectivity Changes in Neuropathic Pain*, April 2008

GRAND ROUNDS, INVITED/VISITING LECTURES

1991-1997

1. Arizona Health Sciences Center Student Research Forum, *An Automated Data Analysis and Collection System for Measuring Isolated Atrial Contractility*, May 1991 (Second Prize, 11th Annual Medical Student Research Forum, 1991)

2. American Federation for Clinical Research Western Regional Conference, *An Automated Data Analysis and Collection System for Measuring Isolated Atrial Contractility* Carmel, CA, February 1992
3. American Federation for Clinical Research National Conference, *An Automated Data Analysis and Collection System for Measuring Isolated Atrial Contractility* Baltimore, MA, May 1992
4. Arizona Health Sciences Center Student Research Forum, Featured Speaker, *Characterization and Optimization of Radiofrequency Catheter Ablation for the Treatment of Cardiac Arrhythmias*, May 1992
5. American Heart Association National Conference, *Delivery of Radiofrequency Energy to All Four Poles of a Catheter Increases Lesion Size*, New Orleans, Louisiana, October 1992
6. Yuma Friends of Arizona Health Sciences Center, Keynote Speaker, *Radiofrequency Catheter Ablation as a New Treatment for Cardiac Arrhythmias*, March 1993
7. American Heart Association National Conference, *RF Power Losses in the Energy Delivery System During Ablation*, Atlanta, Georgia, November 1993
8. American Heart Association National Conference, *Frequency Dependent Impedance Measurements: An Indicator of Catheter Contact*, Atlanta, Georgia, November 1993
9. Arizona Health Sciences Center Student Research Forum, *A Thermodynamic Model of Radiofrequency Catheter Ablation for the Treatment of Cardiac Arrhythmias*, May 1994 (First Prize, 14th Annual Medical Student Research Forum, 1994)
10. Pacing and Cardiac Electrophysiology National Conference, *Tip Temperature is not an Indicator of Myocardial Temperature*, Boston, March, 1995
11. Western Anesthesia Residents Conference, *Choosing a DLT: Is There a Racial Difference in Airway Size?*, Universal City, California, April 1997
12. Western Anesthesia Residents Conference, *Magnetic Resonance Therapy Guided Stellate Ganglion Block*, April 1997 (Finalist)
13. American Society of Anesthesiologists, *Choice and Placement of DLTs in Asian Patients*, October, 1997
14. Bard, Electrophysiology Division, *New Directions in Radiofrequency Catheter Ablation* Billerica, MA, October 1997
15. California Society of Anesthesiologists, *Magnetic Resonance Therapy Guided Stellate Ganglion Block*, San Francisco, CA June 1998
16. Mackey, S., Sze, D., Gaeta, R., *Magnetic Resonance Therapy Guided Regional Blockade for Pain Management* American Society of Anesthesiologists, October 1999

2000

17. Continuing Medical Education, Invited Speaker, *Management of Pain Using NSAIDs and Cox-2 Inhibitors*, Menlo Park, CA April 2000
18. Stanford University Annual Hand Physical Therapy Symposium, Invited Speaker, *Complex Regional Pain Syndrome*, Stanford, California, June 2000
19. Oregon Health Sciences Center, Invited Speaker, *Management of Acute Pain*, Portland Oregon, September 2000
20. Spokane Washington VA Medical Center, Invited Speaker, *Management of Acute and Chronic Pain*, Spokane, Washington, September 2000
21. Stanford University Department of Neurosurgery, Grand Rounds, *Current Concepts in Acute Pain Management*, October 2000
22. UC Davis Department of Orthopedics, Grand Rounds, *Management of Acute Pain in Orthopedic Patients*, Davis, California, November 2000
23. UC Davis Department of Physical Medicine and Rehabilitation, Invited Speaker, *Physiology and Pharmacology of Pain Management*, Davis, California, November 2000
24. UC Davis Department of Anesthesiology, Invited Speaker, Division of Pain Management, *Multimodality Acute Pain Management*, Davis, California, November 2000
25. Pain Management Symposium, Invited Speaker, *New Concepts in the Management of Acute Pain*, Los Gatos, California, December 2000
26. Stanford University Department of Orthopedics Annual Research Forum, Keynote Speaker, *Multimodality Pain Management and Rehabilitation in Orthopedic Patients*, December 2000
27. Continuing Medical Education, Invited Speaker, *Current Concepts in the Management of Acute Pain*, San Francisco, California, December 2000

2001

28. Stanford University Department of Urology, Grand Rounds, *Perioperative Pain Management of the Urologic Patient*, January 2001
29. Travis Air Force Base, January 2001
 - a. Department of Surgery, Grand Rounds, *Current Concepts in Perioperative Pain Management*
Department of Orthopedic Surgery, Invited Speaker, *Acute Pain Management for Orthopedic Patients*
 - b. Department of Anesthesiology, Invited Speaker, *Multimodality Perioperative Pain Management*

30. Stanford University Department of Internal Medicine, *Current Concepts in Chronic Pain Management*, March 2001
31. Palo Alto VA Hospital Department of Internal Medicine, *Multidisciplinary Chronic Pain Management*, April 2001
32. Pain Management Symposium, *Perioperative Orthopedic Pain Management*, Lake Tahoe, Nevada, March 2001
33. Queens Medical Center Department of Obstetrics and Gynecology, Grand Rounds, *Multimodality Perioperative Pain Management*, Hawaii, April 2001
34. Stanford University Annual Hand Physical Therapy Symposium, Invited Speaker, *Management of the Patient with Complex Regional Pain Syndrome*, Stanford, California, June 2001
35. Pain Symposium, *Current Concepts in Perioperative Pain Management*, Stockton, California, July 2001
36. Pain Management Symposium, *Multimodality Perioperative Pain Management*, Modesto, California, July 2001
37. San Mateo Medical Center, Grand Rounds, *Current Strategies in Acute Pain Management*, July 2001
38. Kern Hospital Department of Anesthesiology Grand Rounds, *Perioperative Pain Management Techniques*, August 2001
39. Pain Symposium, Multimodality Acute Pain Management, Walnut Creek, California, September 2001
40. Stanford University Annual Hand Physical Therapy Symposium, Invited Speaker, *Management of Patients with Complex Regional Pain Syndrome*, Stanford, California, October 2001
41. Tacoma Valley Medical Center, Grand Rounds, *Current Concepts in Perioperative Pain Management*, Tacoma, Washington, October 2001
42. Pain Management Symposium, *Acute Pain Management*, Tacoma, Washington, October 2001
43. Pain Management Symposium, *Mechanistic Approach to Neuropathic Pain Management*, Oakland California, November 2001
44. Santa Clara County Medical Center, Grand Rounds, *Current Strategies in Perioperative Pain Management*, Santa Clara, California, November 2001
45. American College of Rheumatology (ACR) Annual Meeting, Invited Speaker for Advances in Rheumatology Symposium, *Perioperative Pain Management*, San Francisco, California, November 2001

46. Stanford University Pain Management Symposium, Stanford, California, December 2001
Acute Pain Management
Physiology of Pain

2002

47. Education for Physicians on End-of-life Care, Invited Speaker, *Management of Chronic Pain*, San Mateo, California, January 2002
48. Mercy San Juan Hospital, Grand Rounds, *Management of Patients in Acute Pain*, Mercy, California, January 2002
49. Pain Management Symposium, *Perioperative Management of Pain*, Sacramento, California, January 2002
50. American Academy of Pain Medicine (AAPM) Annual Meeting, Invited Speaker, *Acute Pain Management*, February 2002
51. Stanford Department of Anesthesia, Grand Rounds, *Advanced Imaging Techniques for Pain Research*, March 2002
52. Education for Physicians on End-of-life Care, Invited Speaker, *Current Concepts in Chronic Pain Management*, San Mateo, California, March 2002
53. Société Internationale de Chirurgie Orthopédique et de Traumatologie (SICOT), Keynote Speaker *Perspectives in Pain for the Orthopaedic Surgeon – Optimizing the Management of Surgical Pain : Recent Advances and Current Trends*, San Diego, CA, August 2002
54. Swedish Medical Center Annual Medical Meeting, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain: The Imaging of Pain Processing*, Seattle, WA, 2002
55. New York Post Graduate Assembly (PGA) Annual Anesthesia Meeting, *Perioperative Pain: Novel Approaches to Management*, New York, NY, December 2002

2003

56. University of Utah Pain Management Center, *Functional Neuroimaging of Pain Processing*, Grand Rounds, Salt Lake City, UT, February 2003
57. McKay General Hospital, Grand Rounds, *Current Concepts in Chronic Pain Management*, Utah, February 2003
58. Stanford Brain Research Center, Invited Speaker, *The Imaging of Pain Processing – Future Directions in Pain Research*, Stanford, CA, March 2003
59. California Society of Industrial Medicine, Invited Speaker, *Management of Chronic Pain – Focus on Opiates*, July 2003

60. John Muir Hospital, Grand Rounds, *The Strain in Pain Lies Mainly in the Brain – Insights into Chronic Pain through Functional Neuroimaging*, August 2003
61. American College of Rheumatology (ACR) Annual Meeting, Invited Speaker for Advances in Rheumatology Symposium, *Mechanisms of Inflammatory Pain*, Orlando, Florida, November 2003
62. Marin General Hospital Annual Pain Symposium, Invited Speaker, Multimodal Perioperative Pain Management, December 2003

2004

63. Stanford University Neurosciences Institute, Invited Speaker – Meet the Press, *Chronic Pain – Seeking a Solution in the 21st Century*, March 2004
64. American Academy of Orthopedic Surgeons Annual Meeting, Invited Speaker, *Chronic Pain Management – Focus on Opiates*, San Francisco, CA, March 2004
65. Oregon Health Sciences Center, Grand Rounds, *The Imaging of Pain Processing*, Portland, OR, April 2004
66. Stanford Department of OB/GYN, Grand Rounds, *Perioperative Pain Management*, April 2004
67. University of Wisconsin, Visiting Professorship, Madison WI, April 2004
 - a. *Chronic Pain Management – Focus on Interdisciplinary Treatment and Opiates*
 - b. *The Strain in Pain is Felt Mainly in the Brain – The Imaging of Pain Processing*
68. American Pain Society Meeting, Invited Speaker – Psychosocial Data Blitz, *Augmented Control of Brain Activity and Pain Through Real Time fMRI Feedback*, Vancouver, Canada, May 2004
69. Marin General Hospital Pain Management Symposium, Invited Speaker, *Chronic Pain Management – Focus on Multidisciplinary Treatment and Opiates*, Marin, CA, May 2004
70. Stanford Annual Physical Therapy Conference, *Complex Regional Pain Syndrome*, May 2004
71. Santa Clara Valley Medical Center Department of Urology, Grand Rounds, *Perioperative Pain Management for the Urologic Surgeon*, San Jose, CA May 2004
72. Emory University Department of Anesthesia, Visiting Professor, May 2004
 - a. *Current Concepts in Perioperative Pain Management*
 - b. *The Strain in Pain is Felt Mainly in the Brain – The Imaging of Pain Processing*
73. Invited Speaker, *Mechanisms of Inflammatory Pain: Therapeutic Implications*, Atlanta Georgia, May 2004
74. California Society of Industrial Medicine, Invited Speaker, *Chronic Pain Management – Focus on Multidisciplinary Treatment and Opiates*, San Diego, CA June 2004

75. University of Utah Pain Management, Grand Rounds, *An Update on Neuroimaging of Pain*, Salt Lake City, Utah, September 2004
76. Latter Day Saints Hospital, Invited Speaker, *Chronic Pain Management – Focus on Coxibs and Opiates*, Salt Lake City, Utah, September 2004
77. Bay Area Podiatry Association, Invited Speaker, *Perioperative Pain Management*, Los Gatos, CA, September 2004
78. Stanford University Community Lecture Series, *Pain in the Brain: Novel Treatments Made Possible by Neuroimaging*, November 2004

2005

79. Stanford Department of Orthopedics, Division of Hand Surgery, Invited Speaker, *Complex Regional Pain Syndrome*, January 2005
80. UCSF Memory and Aging Group, Grand Rounds, *The Strain in Pain is Felt Mainly in the Brain – The Imaging of Pain Processing*, January 2005
81. Stanford Department of Anesthesia/Medical College of Wisconsin Annual Anesthesia Meeting, Invited Speaker, *Current Concepts in Perioperative Pain Management*, Copper Mountain, Colorado, February 2005
82. Stanford Department of Anesthesia/Medical College of Wisconsin Annual Anesthesia Meeting, Invited Speaker, *New Ideas in Regional Anesthesia for Extremity Surgery*, Copper Mountain, Colorado, February 2005
83. Stanford Department of Anesthesia, Grand Rounds, *Chronic Pain Management – An Overview and Update on Multidisciplinary Treatment*, March 2005
84. Pain Management CME Lecture, *Chronic Pain Management – Focus on Multidisciplinary Treatment and Opiates*, Hayward CA, April, 2005
85. Northern California Orthopedics Association Annual Meeting, Invited Speaker, *Current Concepts in Perioperative Management for the Orthopedic Surgeon*, Aptos, CA, May 2005
86. Association for University Anesthesiologists, *Control of Brain Activation and Pain Perception Through Real-Time fMRI Feedback*, Baltimore, MD, May 2005
87. Kaiser Annual Pain Management Symposium, *Chronic Pain Management: A Focus on Multidisciplinary Treatment and Opiates*, Stockton, CA June 2005
88. Stanford Department of Surgery, Invited Speaker, *Perioperative Pain Management*, Stanford CA, August 2005
89. American Society of Pain Educators Annual Meeting, Keynote Speaker, *Pain: A Focus on Central Sensitization*, August 2005

90. Stanford Pain and Palliative Care Conference, Invited Speaker, *Pain Clinic Referrals and Outpatient Interventions*, Stanford, CA, September 2005
91. Swedish Hospital Annual Pain Management Symposium, Invited Speaker, *Opiates – The Good, The Bad and The Really Ugly*, September 2005
92. American College of Surgeons Annual Conference, Invited Speaker, *Perioperative Pain in the Anticoagulated Patient*, San Francisco, CA, October 2005
93. Stanford Neurology Grand Rounds, *Functional Neuroimaging of Pain*, Stanford, CA, October, 2005
94. American Society of Regional Anesthesia and Pain Medicine, Invited Speaker, *Outcomes in Pain Management*, Miami, FL, November 2005
95. American Medical Association Science Writers Conference, Featured Speaker, *Improving Quality of Life when Battling Diabetic Peripheral Neuropathy*, Washington, DC, November 2005

2006

96. American Academy of Pain Management National Conference, *Functional Neuroimaging of Pain*, San Diego, CA, January, 2006
97. UCSF Pain Symposium, Invited Speaker, *Psychopharmacology of Pain Management*, San Francisco, CA, January, 2006
98. San Jose Regional Medical Center, Grand Rounds, *Neuropathic Pain*, San Jose, CA, January, 2006
99. Stanford Internal Medicine Department, Grand Rounds, *Pain and the Brain – What has Neuroimaging Taught Us?*, Stanford, CA, March 2006
100. American Society of Pain Educators, CME, *Pain Mechanisms: The Basis for Optimizing Outcomes*, Los Angeles, CA, May, 2006
101. Good Samaritan Hospital, Grand Rounds, *Neuropathic Pain*, San Jose, CA, May, 2006
102. American Pain Society Meeting, Invited Speaker, *Pain and the Brain: What Has Neuroimaging Taught Us?* Talk broadcast nationally to 4,000 physicians, San Antonio, TX, May, 2006
103. American Pain Society Meeting, Invited Speaker, *Prevalence and Pathophysiology of Chronic Pain*, San Antonio, TX, May 2006
104. California Society of Industrial Medicine Annual Meeting, *The Strain in Pain Lies Mainly in the Brain*, Lake Tahoe, NV, June 2006
105. Los Gatos Community Hospital, Grand Rounds, *Multidisciplinary Pain Management*, Los Gatos, CA, August 2006

106. American Association Physicians Indian Origin, Guest Speaker, *What has Neuroimaging Taught us About Pain and the Brain?* Newark, CA, August 2006
107. Swedish Hospital Annual Pain Management Symposium, Invited Speaker, *Pain and the Brain – Functional Studies and Potential New Therapies*, Seattle, WA, September 2006
108. UCSF Pain Group, Invited Speaker, *Neuroimaging and Pain: Results from the Spinal Cord to the Brain*, San Francisco, CA, September 2006
109. American Society of Anesthesiologists Annual Meeting – Refresher Course, Outcomes in Pain Management, Chicago, October 2006
110. Johns Hopkins, Visiting Professorship, *Pain and the Brain – What has Neuroimaging Taught Us?*, Baltimore, MD, October, 2006
111. American Society of Pain Educators, CME, *Pain Mechanisms: The Basis for Optimizing Outcomes*, Palo Alto, CA, November 2006
112. American Society of Regional Anesthesia and Pain Medicine Annual Meeting, *Neuroimaging of Pain*, San Francisco, CA, November 2006
113. North American Neuromodulation Society Annual Meeting, *Functional Brain Imaging: Neural Circuitry of Pain, Movement Disorders, and Psychiatric Disorders*, Las Vegas, NV, December 2006
114. Stanford Department of Otolaryngology/Head and Neck Surgery, Grand Rounds, *Pain and the Brain: Insights through Neuroimaging*, Palo Alto, CA, December 2006

2007

115. University of Washington, 25th Annual Bonica Visiting Professor, *Changing Pain in the Brain*, Seattle, WA, March 2007
116. Emory University, *Pain and the Brain – What has Neuroimaging Taught Us?*, Steamboat Springs, CO, February 2007
117. Emory University, *Neuropathic Pain*, Steamboat Springs, CO, February 2007
118. Emory University, *Current Concepts in Perioperative Pain Management*, Steamboat Springs, CO, February 2007
119. Emory University, *New Ideas for Regional Anesthesia in Extremity*, Steamboat Springs, CO, February 2007
120. American Academy of Pain Medicine Annual Meeting, Invited Speaker, *Neuroimaging of the Brain: Changes Due to CRPS*, New Orleans, LA, February 2007
121. Santa Clara Valley Medical Center, Neuroscience Grand Rounds, *The Strain in Pain Lies Mainly in the Brain*, San Jose, CA, March 2007

122. National Institutes of Health, Invited Speaker, *Emotional and Cognitive Factors in Pain*, Bethesda, MD, April 2007
123. American Pain Society Annual Meeting, Invited Speaker, *Opening Windows Into the Brain: Advances in Neuroimaging of Pain*, Washington, DC, May 2007
124. Marin Pain Consortium, Invited Speaker, *Pain and the Brain – What Have We Learned from Neuroimaging?*, Mill Valley, CA, May 2007
125. Juvenile/Adolescent CRPS Consensus Conference, Invited Speaker, *fMRI Imaging CRPS in Adults*, Stanford, CA, May 2007
126. National Marfan Foundation National Conference, Invited Speaker, *Adult Pain Management*, Stanford, CA July 2007
127. Stanford Department of Anesthesia Grand Rounds, *Changing Pain in the Brain*, Stanford, CA, August 2007
128. Stanford Reunion Homecoming, Classes Without Quizzes, *The Strain in Pain Lies Mainly in the Brain*, Stanford, CA, October 2007
129. American Society of Anesthesiologists Annual Meeting, Invited Speaker, *Evaluating Outcomes in Pain Medicine*, San Francisco, CA, October 2007
130. American Society of Anesthesiologists Annual Meeting, Invited Speaker, *Cervicogenic Headache: More Than Just a Pain in the Neck*, San Francisco, CA, October 2007
131. Johns Hopkins University School of Medicine, *Cases and Conversations: A Fibromyalgia Workshop*, Marina del Rey, CA, October 2007
132. IASP 10th International Conference on the Mechanisms & Treatment of Neuropathic Pain, Invited Speaker, *Mechanisms and Treatment of Chronic Low Back Pain*, Salt Lake City, UT, November 2007
133. Stanford Department of Neurosurgery Grand Rounds, *Pain and the Brain: What Has Neuroimaging Taught Us?*, Stanford, CA, November 2007
134. Lockheed Martin Palo Alto Colloquium, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain*, Palo Alto, CA, November 2007

2008

135. Neuroscience Institute at Stanford, Lecture for First Year Students, *The Strain in Pain Lies Mainly in the Brain*, Stanford, CA, January 2008
136. Stanford Neuroscience, Behavior & Cognition Journal Club, Stanford, CA, January 2008

137. Stanford Department of Anesthesia Senior Resident Lecture Series, *Acute Pain Management*, Stanford, CA, February 2008
138. Stanford Department of Neurology Resident Lecture Series, *Overview of Pain Systems and Management*, Stanford, CA, February 2008
139. Stanford University School of Medicine 21st Annual Anesthesia Update, Invited Speaker, *Update on Regional Anesthesia*, Big Sky, MT, February 2008
140. Stanford University School of Medicine 21st Annual Anesthesia Update, Invited Speaker, *Current Concepts in Perioperative Pain Management*, Big Sky, MT, February 2008
141. Stanford University School of Medicine 21st Annual Anesthesia Update, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain*, Big Sky, MT, February 2008
142. Stanford University School of Medicine 21st Annual Anesthesia Update, Invited Speaker, *Opioids: The Good, the Bad, and the Ugly*, Big Sky, MT, February 2008
143. Stanford Department of Anesthesia, ANES 202 Anesthesiology & Pathophysiologic Implications for the Perioperative Patient, *Pain Management in the 21st Century*, Stanford, CA, February 2008
144. Stanford University School of Medicine, Med School 101 Lecture to High School Students, Stanford, CA, February 2008
145. Stanford Department of Anesthesia, Resident Journal Club, *Pain Management*, Stanford, CA, March 2008
146. Stanford Neuroscience, Behavior & Cognition Scholarly Concentration Journal Club, Stanford, CA April 2008
147. American Pain Society Annual Meeting, Invited Speaker, *Biofeedback: Past, Present and Future*, Tampa, FL, May 2008
148. Stanford Center for Education 2nd Annual Innovations with Pain Management Course, Invited Speaker, *Introduction and Overview of Pain Management*, Palo Alto, CA, August 2008
149. Stanford Center for Education 2nd Annual Innovations with Pain Management Course, Invited Speaker, *Current Research/Future Trends*, Palo Alto, CA, August 2008
150. International Association for the Study of Pain 12th World Congress on Pain, Invited Speaker, Pain Info Exchange Symposium, *What Neuroimaging Reveals About Pain*, Glasgow, August 2008
151. 12th Congress of the European Federation of Neurological Sciences, Invited Speaker, Pain Info Exchange Symposium, *Illuminating our Understanding of Pain*, Madrid, August 2008
152. University of California San Diego, Visiting Professor, *The Strain in Pain Lies Mainly in the Brain*, San Diego, CA, September 2008

153. University of California San Diego, Visiting Professor, *Cortical Changes in Neuropathic Pain*, San Diego, CA, September 2008
154. Massachusetts General Hospital, Visiting Professor, Grand Rounds, Boston, MA, September 2008
155. Stanford Hospital & Clinics CME 3rd Annual Focus on Complex Care for Case Managers, Invited Speaker, *Pain Management*, Stanford, CA, September 2008
156. Stanford Hospital & Clinics Community Lecture Series, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain*, Stanford, CA, September 2008
157. Stanford University Sleep Grand Rounds, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain: Lessons Learned Through Neuroimaging*, Stanford, CA, September 2008
158. California Society of Physical Medicine & Rehabilitation, Invited Speaker, *Fibromyalgia: From Mechanisms to Treatment*, San Jose, CA, October 2008
159. Stanford Health Library Community Lecture, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain: Lessons Learned Through Neuroimaging*, Stanford, CA, October 2008
160. Stanford University Sleep Clinic, Grand Rounds, *The Strain in Pain Lies Mainly in the Brain: Lessons Learned Through Neuroimaging*, Stanford, CA, October 2008
161. American Society of Anesthesiologists Annual Meeting, Invited Speaker, *Evaluating Outcomes in Pain Medicine*, Orlando, FL, October 2008
162. American Society of Anesthesiologists Annual Meeting, Forum Moderator, How Do I Treat Neuropathic Pain and Complex Regional Pain Syndrome, Orlando, FL, October 2008
163. Science Writers New Horizons in Science Conference, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain*, Stanford, CA, October 2008
164. Wake Forest University Advances in Physiology and Pharmacology in Anesthesia and Critical Care, Invited Speaker, *Brain Imaging and Pain Perception*, Sulphur Springs, WV, November 2008
165. Stanford Center for Law & The Biosciences, Neuroimaging, Pain & The Law Conference, Invited Speaker, *The Neuroscience of Pain*, Stanford, CA, December 2008
166. North American Neuromodulation Society Annual Meeting, Invited Speaker, *Neural Circuits of Pain*, Las Vegas, NV, December 2008
167. North American Neuromodulation Society Annual Meeting, Invited Speaker, *Clinical Trial Designs*, Las Vegas, NV, December 2008

2009

168. American Academy of Pain Medicine Annual Meeting, Invited Speaker, *Functional Imaging in CRPS*, Honolulu, HI, January 2009
169. Yale University, Invited Speaker, Grand Rounds, New Haven, CT, February 2009
170. Stanford 22nd Annual Anesthesia Update, Invited Speaker, *Neuropathic Pain: Current Mechanisms and Treatments*, Big Sky, MT, February 2009
171. Stanford 22nd Annual Anesthesia Update, Invited Speaker, *Abuse of Prescription Pain Meds and How to Stay Out of Trouble While Prescribing Them*, Big Sky, MT, February 2009
172. Stanford 22nd Annual Anesthesia Update, Invited Speaker, *When Acute Pain Becomes Chronic – What Do We Know and How Can We Prevent It?*, Big Sky, MT, February 2009
173. Society for Urodynamics and Female Urology Annual Meeting, Invited Panelist, *Cortical Restructuring in Patients with Chronic Pain*, Las Vegas, NV, February 2009
174. Google Tech Talk Seminar Series, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain*, Mountain View, CA, March 2009
175. Western Pain Society Annual Meeting, Invited Speaker, *Functional Imaging of Pain*, Englewood, CO, April 2009
176. American Pain Society 28th Annual Meeting, Invited Speaker, *Cognitive Aspects of Pain*, San Diego, CA May 2009
177. University of Pittsburgh, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain: Lessons Learned from Functional Neuroimaging*, Pittsburgh, PA May 2009
178. National Institutes of Health, Invited Speaker, *The Strain in Pain Lies Mainly in the Brain: What Have We Learned from the Neuroimaging of Pain?*, Bethesda, MD, May 2009

TEACHING ACTIVITIES (UNIVERSITY)

Fellowship

Founder and Director, Regional Anesthesia Program, Department of Anesthesiology, 2000-Present
 Trainees

Eric Amador, M.D.	2002-2003
-------------------	-----------

Faculty, Pain Management Fellowship

Trainees

Francesco Isolani, M.D.	1999-2000
David Levi, M.D.	1999-2000
Prasaad Movva, M.D.	1999-2000
Ahmed Ebeid, M.D.	2000-2001
Steve Mangar, M.D.	2000-2001
Mona Vora, M.D.	2000-2001
Bradley Carpentier, M.D.	2000-2001

David Morris, M.D.	2001-2002
Elizabeth Board, M.D.	2001-2002
Darien Behravan, D.O.	2002-2003
James Shaw, M.D.	2002-2003
Guy Sanani, M.D.	2002-2003
Michael Scannell, M.D.	2002-2003
Ian Carroll, M.D.	2003-2004
Azita Far, M.D.	2003-2004
Ross Siebel, M.D.	2003-2004
Kim Kaplan, M.D.	2003-2004
S. Xie, M.D.	2003-2004
Alan Ferro-Gillespi, M.D.	2004-2005
Jason Mauer, M.D.	2004-2005
Biral Patel, M.D.	2004-2005
Paul Reynolds, M.D.	2004-2005
Rasheed Singleton, M.D.	2004-2005
Mir Ali, M.D.	2005-2006
Timothy Dawson, M.D.	2005-2006
Alpana Gowda, M.D.	2005-2006
Jon Hinman, M.D.	2005-2006
William Wagner, M.D.	2005-2006
Afshin Zeighami, M.D.	2005-2006
Neetu Ahluwalia, M.D.	2006-2007
Jane Ahn, M.D.	2007-2008
David Byrd, M.D.	2007-2008
Tracy Jackson, M.D.	2007-2008
Joel Mata, M.D.	2007-2008
Kale Wedemeyer, M.D.	2007-2008
Meredith Barad, M.D.	2007-2008
Peter Barelka, M.D.	2007-2008
Mike Brook, M.D.	2007-2008
Mark Carlisle, M.D.	2007-2008
Dhiruj Kirpalani, M.D.	2007-2008
Einar Ottestad, M.D.	2007-2008

Post-Doctoral Research Fellows

Kim Kaplan, MD	2004-2005
Takefumi Ueno, MD, PhD	2004-2005
Jennifer Kornelsen, PhD	2006-2007
Jane Lawrence, PhD	2006-2007
Jarred Younger, PhD	2006-2008
Meredith Barad, MD	2008-present
Pierre Boveroux, PhD	2008-present

Medical Students

Andrea Crowell	2006-present
Meghan Tieu	2008-present

Graduate Students

Robert Lobato, M.S, M.D.	2003-2004
Joel Darnauer, PhD	2006-2007

Justin Brown, MS

2006-present

Classroom

Annual Regional Anesthesia Workshop, 1999 - Present (organized and chaired)
Outcomes in Spinal Cord Stimulation, 1999
Lumbar Sympathetic Blockade – A Review, 2000
Complex Regional Pain Syndrome, 1999, 2000
Department of General Surgery, Current Concepts in Acute Pain Management, 2000
Lower Extremity Regional Blockade, 2000, 2001, 2002, 2003, 2004, 2005
Current Concepts in Acute Pain Management, 2000
Department of Physical Medicine and Rehabilitation, Pharmacology for Pain Management –
Neuropathic Agents, January 2001, 2002
Upper Extremity Regional Blocks, 2002, 2003, 2004, 2005
Chronic Pain Management, 2002
IASP Pain Management Fellow Lecture Series (multiple lectures), 2000 – 2005
Department of Anesthesia Resident Refresher Course – 2003 – 2005
Human Biology 100 – Pain and the Brain, February, 2006
Psychology 202, Cognitive Neuroscience, Functional Neuroimaging of Pain, March, 2006
Neurosciences Lab – Spinal Cord – March, 2006
Neurobiology of Disease NEN 2005, Neuroimaging of pain, January 2007

Medical School Courses

Medical Student Clerkship #304A: Acute Pain, 2000 – present

COMMITTEES

National / International

Director at Large, American Academy of Pain Medicine, 2008-present
American Academy of Pain Medicine Executive Committee, 2009-present
NHLBI Workshop on Sickle Cell Disease Sub-Committee on Pain, 2007-present
International Association for the Study of Pain Pain Clinic Guidelines Taskforce 2008-present
American Society of Anesthesiology Pain Committee, 2007-present
American Society of Anesthesiology Pain Directors Committee, 2007-present
California Department of Workers Compensation, 2007-present
California Neuropathy Task Force, 2008-present
American Society of Anesthesiology Anesthesiology Continuing Education (ACE), 2005-present

Stanford University

Alwin Rambar-James B.D. Mark Award for Excellence in Patient Care Selection Committee, 1998
Department of Anesthesia Education Committee, 1996-to 1998
Stanford University Medical Center - General Medical Education Committee, 1997- to 1998
Information Technology Committee, Department of Anesthesia, 1999 to present
Residency Selection Committee, Department of Anesthesia, 1999 to present
Incentive Committee, Department of Anesthesia, 2000
Call Committee, Department of Anesthesia, 2002
Anesthesia Resident Admissions Committee, 2000-present

Governance Committee, Department of Anesthesia, 2003-present
Medical School Admissions Committee, 2003-present
Neuroscience Admissions Committee, 2004-present
Deep Venous Thrombosis Committee, 2004-present
Electronic Medical Record Committee, 2005-present
Clinical Commitment Committee, 2005-present

University of Arizona

Founding Member - MD/PhD Committee, 1992-94

LANGUAGES

Computer Languages: C, Visual Basic, Pascal, FORTRAN

WEB SITES DEVELOPED AND ADMINISTERED

1. <http://paincenter.stanford.edu/> - Developed and maintain Stanford Pain Management Center Web Site
2. <http://anesthesia.stanford.edu/> - Developed and maintain an internal Stanford Department of Anesthesia web site focused on resident, faculty, and staff education
3. <http://anesthesia.stanford.edu/regionalanesthesia> - Developed and maintain internal Stanford site focused on the principles and practices of regional anesthesia

MEMBERSHIP IN PROFESSIONAL SOCIETIES

American Society of Anesthesiologists
American Pain Society
American Society of Regional Anesthesia
American Academy of Pain Medicine
International Association for the Study of Pain
International Anesthesia Research Society
California Society of Anesthesiology
Institute of Electrical and Electronic Engineers
Eta Kappa Nu (Electrical Engineering Honor Society – Founder Univ Arizona Chapter)
Society for Neuroscience

EMPLOYMENT AND CONSULTING EXPERIENCES

Research Engineer/Technician - La Jolla Technology, La Jolla, California, 1985.

Performed feasibility study on electrical stimulation for soft tissue healing. Initiated design and development of microprocessor-based muscle stimulator/TENS. Assisted development of devices to promote osteogenesis in non-unions through the use of electrical stimulation. Conducted experiments for the University Of Pennsylvania Orthopedic Research Department to test these devices.

Research Associate/Biomedical Engineer - Philadelphia VA Hospital, Department of Pulmonary Medicine, Philadelphia, Pennsylvania. 1985-86.

Principal Investigator - Designed automated system to determine thoracoabdominal configuration in patients with COPD.

Co-investigator - Designed protocol and implemented study to determine optimal flow parameters in jet nebulizers delivering bronchodilator agents to patients with COPD.

Research Assistant/Electrical Engineer - University Medical Center - Department of Anesthesiology, Tucson, Arizona. 1987-93. Designed and built automated system to measure contractility effects of anesthetic agents on guinea pig heart tissue *in vitro*. Assisted with anesthesia, delivery and monitoring during bovine artificial heart (Jarvik 7) replacement.

Owner and Founder - Altech Consultants, Sunnyvale, California, 1987-Present
Operate an engineering consulting company specializing in medical electronics, computer systems and their integration to medical instrumentation. Designed hardware and software, operated day to day business including accounting, subcontracted work, negotiated with clients, delegated assignments, developed consulting plans.

Principal Investigator/Consultant to C.R. Bard Inc., 1987 - 1998.

Directed several projects using radiofrequency catheter ablation to treat cardiac arrhythmias at the Department of Internal Medicine, Section of Cardiology, Tucson, Arizona. Work focused on the treatment and cure of atrial fibrillation. These projects include determining optimal delivery parameters for delivery of radiofrequency energy, computer modeling of ablation energy and its effect on the myocardium, characterizing energy losses in delivery system, and determining temperatures within myocardium during ablation. Write protocols, obtain grants, manage budget, coordinate purchasing, coordinate and supervise multiple studies, supervise engineers and medical students, conduct experiments, analyze and prepare data for publication and presentation at national conferences.

Project Leader/Consultant to IREF Inc., San Francisco, CA., 1996 – 1998.

Co-investigator with Dr. Christina Mora-Mangono on project to develop multimodality neurological monitoring system. Development of a system will to study the effects of cardiac surgery and anesthesia on neurologic and psychiatric outcomes in patients. Supervise engineers, manage budget, coordinate purchasing, conduct experiments, analyze and prepare data for publication.

Member - Board of Directors, Acoustic Technologies Inc., 1997 – Present.

A new company whose goal is to bring medical technologies to market and provide an environment to pursue innovative research. The first product is an improved dissolvable tympanostomy tube (Three patents approved).

LICENSES

Diplomat - Pain Medicine Subspecialty, American Board of Anesthesiologists 2000
Diplomat of American Board of Anesthesiologists 1999
California Medical License A055270
DEA BM4962848

PUBLIC AND PROFESSIONAL SERVICE

Board of Medical Directors – Interplast 1997-2000
Volunteer Trips - Thailand, 1997
Etta Kappa Nu, Electrical Engineering Honor Society - Founding Member University of Arizona Chapter, 1987-1993

Co-Founder and President, M.D./Ph.D. Club University of Arizona, College of Medicine, 1991-1993

VOLUNTEER ACTIVITIES

American Cancer Society, 1989.

Philadelphia, Pennsylvania VA Hospital, Department of Pulmonary Medicine, 1985-86

University Medical Center, Department of Anesthesiology, Tucson, AZ, 1987-1991

University Medical Center, Section of Cardiology, Tucson, AZ, 1988-1993