

## JASON A. LIAUW, M.D.

### CLINICAL TRAINING

**2014-2015: The Johns Hopkins Hospital**  
Chief Resident, Neurosurgery  
**2012-2014: The Johns Hopkins Hospital**  
Fellowship in Complex Spine Surgery and Spinal Oncology  
**2009-2012: The Johns Hopkins Hospital**  
Resident, Neurosurgery  
**2008-2009: The Johns Hopkins Hospital**  
General Surgery Internship

ABNS BOARD CERTIFICATION American Board of Neurological Surgery Primary Examination (3/12/2011)

MEDICAL LICENSE California Board of Physicians (8/15)  
Maryland Board of Physicians (5/12)

HOSPITAL PRIVILEGES Staff, Department of Neurosurgery  
Mission Viejo Hospital, Mission Viejo CA (9/15-present)  
Saddleback Regional Medical Center, Laguna Hills CA (9/15-present)

Staff, Department of Neurosurgery  
The Johns Hopkins Hospital, Baltimore MD(7/08-7/15)  
The Johns Hopkins Hospital – Bayview Campus, Baltimore MD (7/08-7/15)  
Sinai Hospital, Baltimore MD (7/12-6/14)

EDUCATION **2003-2008: Stanford University School of Medicine**  
Biomedical Engineering Scholarly Concentration  
M.D. Awarded 6/1/2008

**2003: B.A., Washington University in St. Louis**  
Biology, Biomedical Physics  
Elliot Scholar; College Honors; Dean's List.

PROFESSIONAL MEMBERSHIPS 2013: North American Spine Society  
2009: American Association of Neurological Surgeons  
2009: Congress of Neurological Surgeons  
2008: American College of Surgeons

AWARDS TEACHING **2015: Frank Coulson Jr. Award for Clinical Excellence**  
**2014: Macklin Foundation Grant (975K)**  
**2012: AANS/CNS Apfelbaum Research Award (15K)**  
**2006: 1<sup>st</sup> Place Stanford Medical Research Annual Symposium**  
**2006: American Heart Association Research Fellowship**  
**2005-2006: Medical Scholars Research Fellowship**  
2005: Teaching Assistant for Clinical Medicine 2<sup>nd</sup> Year Course  
2004: Teaching Assistant for Anatomy Course  
2004: Teaching Assistant for Clinical Medicine 1<sup>st</sup> Year Course  
2003: Teaching Assistant for Neurophysiology Course  
2002-2003: Howard Hughes Medical Institute Research Fellowship  
2003: 1<sup>st</sup> Place in Olin Cup Entrepreneurial Competition  
1999: Committee for Advance Science Training Fellowship

REGULATORY  
EXPERIENCE

**2012-2014:** Medical Device Fellowship Program  
Food and Drug Administration, Silver Spring, MD

RESEARCH/  
WORK

**Johns Hopkins Hospital, Department of Neurosurgery**  
Dr. Ziya Gokaslan & Dr. Timothy Witham (April 2012-Present)  
• Research into Biologics for Optimizing Spinal Fusion

**Stanford University School of Medicine, Department of Neurosurgery**

*Dr. Gary Steinberg* (June 2005 – 2008)

- Researched thrombospondin involvement in synaptogenesis and axonal recovery after stroke
- Studied stem cell secreted thrombospondins and their synaptogenic effect in vitro
- Demonstrated upregulation of axonal guidance/angiogenic molecule, Netrin-4, after stroke

*Dr. Edward Laws* (June 2007 – 2008)

- Testing contact endoscopy for differentiating pituitary adenomas from normal pituitary tissue

*Dr. Daniel Kim* (May 2004 – 2007)

- Authored patent for DRG stimulation. Designed and oversaw proof of efficacy electrophysiological testing.

**Cliniscient, Inc.**

*Co-Founder* (Aug 2006 - 2007)

- Created HIPAA compliant Web 2.0 searchable databases for multi-center clinical research coordination

**NASA Ames Research Center**

*Electrophysiology Consultant for Nanotube Electrode Array Group* (June 2005 – June 2006)

**AVIGEN, Inc.**

*Research Associate – Neurobiology Division* (June 2003 – 2004)

- Evaluated gene therapy as a means to decrease L-Dopa induced dyskinesia in Parkinsons Disease patients

**Washington University School of Medicine**

*Dr. Min Zhuo* (June 1999 – August 2002)

- Performed Hippocampal and Cortical Slice Electrophysiology to study the roles of CaMK, adenylate cyclase, and cAMP signaling pathways in pain and fear memory in mice

**University of California, Irvine**

*Dr. Diane O'Dowd* (June 1997 – June 1999)

- Performed whole-cell patch clamp electrophysiology to study pre/postsynaptic alterations in *Drosophila*

PUBLICATIONS

1. Puvanesarajah, V., Lo, S. F. L., Aygun, N., **Liauw, J. A.**, Jusué-Torres, I., Lina, I. A., ... & Lim, M. (2015). Prognostic factors associated with pain palliation after spine stereotactic body radiation therapy. *Journal of Neurosurgery: Spine*, 23(5), 620-629.
2. Caplan, J. M., Jusue-Torres, I., Kim, J. E., Luksik, A., **Liauw, J.**, Gottschalk, A., & Tamargo, R. J. (2015). Far-lateral transcondylar approach for microsurgical trapping of an anterior inferior cerebellar artery aneurysm. *Neurosurgical focus*, 39(VideoSuppl1), V6-V6.
3. Puvanesarajah, V., **Liauw, J. A.**, Lo, S. F., Lina, I. A., Witham, T. F., & Gottschalk, A. (2015). Analgesic therapy for major spine surgery. *Neurosurgical review*, 1-13.
4. Sheng-fu, L. L., Otake, Y., Puvanesarajah, V., Wang, A. S., Uneri, A., De Silva, T., **Liauw J.**, Siewerdsen, J. H. (2015). Automatic Localization of Target Vertebrae in Spine Surgery: Clinical Evaluation of the LevelCheck Registration Algorithm. *Spine*, 40(8), E476-E483.
5. Caplan JM, Groves M, Jusue-Torres I, Kim JE, **Liauw J**, Bydon A, Tamargo RJ. Microsurgical Obliteration of a thoracic spinal perimedullary arteriovenous fistula. *Neurosurg Focus*. 2014 Sep;37 Suppl 2:Video 13

6. Theodros, D., Goodwin, C. R., Crane, G. M., **Liauw, J.**, Kleinberg, L., & Lim, M. (2015). Metastatic Extrapulmonary Small Cell Carcinoma to the Cerebellopontine Angle: A Case Report and Review of the Literature. *Case reports in oncological medicine*, 2015.
7. Sankey, E. W., Lopez, J., Zhong, S., Jusue-Torres, I., **Liauw, J.**, Huang, J., ... & Gordon, C. (2015). Perioperative Anticoagulation Increases the Risk of Complications after Cranioplasty. *Plastic and Reconstructive Surgery*, 135(5S), 36-37.
8. Puvanesarajah, V., Lina, I. A., **Liauw, J. A.**, Coon, A. L., & Witham, T. F. (2015). Intercostal aneurysm causing spinal cord compression in an NF1 patient. *European Spine Journal*, 24(5), 940-944.
9. Puvanesarajah V, **Liauw J**, Lo S, Lina I, Witham T. Techniques and accuracy of thoracolumbar pedicle screw placement. *World journal of orthopedics*, (2014) April 5(2) , 112
10. Parker S, Santiago-Dieppa D, Liauw J, Sciubba DS, Bydon A, Wolinsky JP, Gokaslan Z, Witham TF. Incidence and clinical significance of vascular encroachment resulting from free hand placement of pedicle screws in the thoracic and lumbar spine: Analysis of 6,816 consecutive screws. *Spine*. (2014) Jan 29
11. Gordon, C. R., Fisher, M., **Liauw, J.**, Lina, I., Puvanesarajah, V., Susarla, S. & Huang, J. Multidisciplinary Approach for Improved Outcomes in Secondary Cranial Reconstruction: Introducing the Pericranial-onlay Cranioplasty Technique. *Neurosurgery* (2014) Jan 27.
12. Lina, I. A., Puvanesarajah, V., **Liauw, J**, Lo, S. F., Santiago-Dieppa, D. R., Hwang, L., & Witham, T. F. A Quantitative Study of Parathyroid Hormone (1-34) and Bone Morphogenetic Protein-2 on Spinal Fusion Outcomes in a Rabbit Model of Lumbar Dorsolateral Intertransverse Process Arthrodesis. *Spine*. (2014) Mar 1
13. Puvanesarajah, V., Lina, I. A., **Liauw, J.**, Hsu, W., Burger, P. C., & Witham, T. F. Desmoid Tumor Formation following Posterior Spinal Instrumentation Placement. *Evidence-based spine-care journal*, 4(02), 137-142. (2013).
14. **Liauw J**, Hoang S, Choi M, Eroglu C, Choi M, Sun G, Percy M, Wildman-Tobriner B, Bliss T, Guzman R, Steinberg GK. Thrombospondins 1 and 2 are Necessary For Synaptic Plasticity and Functional Recovery After Stroke. *J Cereb Blood Flow Metab* 2008 Oct;28(10):1722-32
15. Hoang S, **Liauw J**, Choi M, Choi M, Guzman R, Steinberg GK. Netrin-4 enhances angiogenesis and neurological outcome after cerebral ischemia.. *J Cereb Blood Flow Metab* 2009 Feb;29(2):385-97
16. Guzman R, De Los Angeles A, Cheshier S, Choi R, Hoang S, **Liauw J**, Steinberg GK (2007) Intracarotid injection of FACS-sorted CD49d positive neural stem cells improves targeted cell delivery and behavior after stroke in a mouse stroke model. *Stroke* 2008 Apr;39(4):1300-6
17. Wei F, Wang GD, Zhang C, Shokat KM, Wang H, Tsien JZ, **Liauw J**, Zhuo M. Forebrain expression of CAMKII abolishes cingulated long term depression and reduces mechanical allodynia and thermal hyperalgesia. *Mol Pain*. 2006 Jun;2:21
18. **Liauw J**, Wu LJ, Zhuo M. Calcium Stimulated Adenylyl Cyclases required for long-term potentiation in the anterior cingulated cortex. *J. Neurophys.* 2005 Jul;94(1):878-82.
19. Doroudchi MM, **Liauw J**, Heaton K, Zhen Z, Forsayeth JR. Adeno-Associated Virus Mediated Gene Transfer of Human Aromatic L-Amino Acid Decarboxylase Protects Mixed Striatal Primary Cultures from L-Dopa Toxicity. *J Neurochem*. 2005 May;93(3):634-40.
20. Lee MC, Wang MY, Fessler RG, **Liauw J**, Kim DH. Instrumentation in patients with spinal infection. *Neurosurg. Focus*. 2004 Dec 15;17(6):E7.
21. Wei F, Xia XM, Tang J, Ao H, Ko S, **Liauw J**, Qui CS, Zhuo M. Calmodulin regulates synaptic plasticity in the anterior cingulated cortex and behavioral responses: a microelectroporation study in adult rodents. *J Neurosci*. 2003 Sep 10;23(23):8402-9

22. Wei F, Qiu CS, **Liauw J**, Robinson DA, Ho N, Chatila T, Zhuo M. Calcium calmodulin-dependent protein kinase IV is required for fear memory *Nat Neurosci*. 2002 Jun;5(6):573-9.
23. **Liauw J**, Wang GD, Zhuo M. NMDA receptors contribute to synaptic transmission in anterior cingulate cortex of adult mice. (*Physiol. Transactions*) *Chn*. 2003 Aug 25;55(4):373-80
24. Ho N, **Liauw J**, Blaeser F, Wei F, Hanissian S, Muglia LM, Wozniak DF, Nardi A, Arvin KL, Holtzman DM, Linden DJ, Zhuo M, Muglia LJ, Chatila TA. Impaired synaptic plasticity and cAMP response element-binding protein activation in Ca<sup>2+</sup>/calmodulin-dependent protein kinase type IV/Gr-deficient mice. *J Neurosci*. 2000 Sep 1;20(17):6459-72.
25. Feng J, Yan Z, Ferreira A, Tomizawa K, **Liauw J**, Zhuo M, Nardi A, Hartman RE, Vogt SK, Luedke CE, Storm DR, Muglia LJ. Spinophilin regulates the formation and function of dendritic spines. *Proc Natl Acad Sci*. 2000 Aug 1;97(16):9287-92.
26. Schaefer ML, Wong ST, Wozniak DF, Muglia LM, **Liauw J**, Zhuo M, Nardi A, Hartman RE, Vogt SK, Luedke CE, Storm DR, Muglia LJ. Altered stress-induced anxiety in adenylyl cyclase type VIII-deficient mice. *J Neurosci*. 2000 Jul 1;20(13):4809-20.

#### BOOK CHAPTERS

1. Puvanesarajah V, Sankey E, Lo SF, Liauw J, Lim M. Supraorbital Craniotomy Keyhole Technique. Endoscopic Skull Base Neurosurgery. 1<sup>st</sup> Edition. Ch. 8
2. Liauw J, Hwang L, Lo L, Witham TF. Treatment of Benign Spinal Tumors: Surgery. Controversies in Stereotactic Radiosurgery. 1<sup>st</sup> Edition. Feb 2014. Ch. 34.
3. Olivi A, Weingart J, Liauw J, Raza S. Framed and Frameless Stereotactic Brain Biopsy. *Youman's Neurological Surgery*. 6<sup>th</sup> Edition. Vol 2. Ch. 114 p.1254-61.
4. Liauw J, Gallia G, Olivi A. Transcollosal Approach. *Core Techniques in Operative Neurosurgery*. Ch. 8. p. 46-52

#### PUBLISHED ABSTRACTS/ PRESENTATIONS

1. **Liauw J**, Hoang S, Choi M, Kalashnikova M, Davis A, Steinberg GK, Guzman R. Expression of Netrin-4 and its Receptors After Hypoxic-Ischemic Injury to the Neonatal Brain. AANS/CNS – Section on Pediatric Neurological Surgery. (Nov 26 2007)
2. Patil C, **Liauw J**, Rupani A, Shivanand P, Steinberg GK, Boakye M. Inpatient outcomes after operative management of intracerebral hemorrhage in the United States: a population based study. AANS (April 26, 2008)
3. **Liauw J**. Mechanisms of Functional Recovery Following Stroke. *Neurosurgery Grand Rounds, Stanford University School of Medicine* (June 18, 2007).
4. **Liauw J**, Hoang S, Choi M, Wildman-Tobriner B, Percy M, Guzman R, Steinberg GK Endogenous Thrombospondins 1 and 2 are Necessary for Synaptic Plasticity and Spontaneous Functional Recovery After Stroke. PLATFORM PRESENTATION: International Stroke Conference 2007 (Feb 2007)
5. **Liauw J**, Eroglu C, Bliss T, **Hoang S**, Choi, MP, DeLosAngeles A, Guzman R, Barres BA, Steinberg GK “Neural Progenitor Cells Enhance Synaptogenesis in Neuronal Cultures: A Thrombospondin Dependent Mechanism” SELECT ABSTRACT: Congress of Neurological Surgeon Conference 2006 (Oct 2006)
6. **Liauw J**, Hoang S, Choi M, Wildman-Tobriner B, Percy M, Guzman R, Steinberg GK Endogenous Thrombospondins 1 and 2 are Necessary for Synaptic Plasticity and Spontaneous Functional Recovery After Stroke. 23rd International Symposium on Cerebral Blood Flow, Metabolism & Function (May 2007)
7. Hoang S, **Liauw J**, Eroglu C, Barres BA, Steinberg GK, “Thrombospondin-4 Mediates Synaptogenesis and Functional Recovery Following Ischemia” Congress of Neurological Surgeon Conference 2006 (Oct 2006)

8. **Liauw J**, Eroglu C, Hoang S, Choi MP, Wildman-Tobriner B, Shen J, Hoang S, Delosangeles A, Guzman R., Bliss T, Barres B, Steinberg GK “Neural progenitor cells enhance synaptogenesis in neuronal cultures: a thrombospondin-dependent mechanism” Society for Neuroscience Conference 2006 (Oct 2006).
9. Hoang S, **Liauw A**, Hwang A, Lee C, Hoang S, Choi M, Guzman R., Bliss T, Steinberg GK “Limb activity is necessary for thrombospondin-4 up-regulation following experimental ischemia” Society for Neuroscience Conference 2006 (Oct 2006).
10. Lee C, Hoang S, **Liauw J**, Nguyen N, Liauw S, Choo K, Guzman, R., Bliss T, Steinberg GK “Thrombospondin-4 mediates synaptogenesis and functional recovery following ischemia” Society for Neuroscience Conference 2006 (Oct 2006)
11. Guzman R., DeLosAngeles A, Cheshier S, **Liauw J**, Hoang S, Bliss T, Steinberg GK “Intraarterial injection of FACS-sorted CD49d-positive neural stem cells improves targeted cell delivery to the mouse brain after stroke” Society for Neuroscience Conference 2006 (Oct 2006)
12. **Liauw J**, Eroglu C, Bliss T, DeLosAngeles A, Guzman R, Barres BA, Steinberg GK “Neural Progenitor Cells Enhance Synaptogenesis in Neuronal Cultures: A Thrombospondin 1-2 Dependent Mechanism” American Society for Neural Therapy and Repair 2006 (May 2006)

OTHER  
CONTRIBUTIONS

**Internet Stroke Center** (<http://www.strokecenter.org>)

*Website Developer* (2001-2002)

- Compiled Online Image Library of PET, MRI, and CT scans to assist in neurological diagnosis.
- Developed a Java based viewer to allow for online visualization of in 3-D perspective.
- Site plans on receiving NIH funding once Congress passes the Stroke Bill

LEADERSHIP  
& SERVICE

**DreamStreet** - Camp for Children with Chronic/Terminal Illnesses

*Counselor* (Summers 2003-2014)

**Leukemia and Lymphoma Society**

*Team Captain for Marathon Team-in-Training* (2002-2003)