

## Alexander S. Taghva

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### EDUCATION

M.D., *Johns Hopkins University School of Medicine*, Baltimore, Maryland

September 2001-May 2005

B.S., *University of Southern California*, Los Angeles, California

Major: Biochemistry; September 1997-May 2001

### RESIDENCY AND FELLOWSHIP

Clinical Instructor in Neurological Surgery, University of Southern California

July 2011-June 2012

Adjunct Faculty, Ohio State University, Department of Neurosurgery

July 2011-June 2012

Fellow in Functional Neurosurgery with Dr. Ali Rezai, Ohio State University

July 2010-June 2011

Resident in Neurological Surgery, University of Southern California

July 2006-June 2010

Intern, General Surgery, University of Southern California

June 2005-June 2006

### CURRENT AFFILIATIONS

Director of Neurotrauma, Mission Hospital Regional Trauma Center, Mission Viejo, CA

November 2014-present

Neurosurgery housestaff, Mission Hospital, Mission Viejo, CA

July 2012-present

Neurosurgery housestaff, Saddleback Hospital, Laguna Hills, CA

July 2012-present

Assistant Clinical Professor, Ohio State University, Columbus, OH

July 2012-2015

### CERTIFICATIONS AND MEMBERSHIPS

Licensed physician, Medical Board of California, State Medical Board of Ohio

Passed American Board of Neurological Surgery written board exam and USMLE Steps 1, 2, and 3

Board-certified, American Board of Neurological Surgery

Fellow of the American Association of Neurological Surgeons

Member of Congress of Neurological Surgeons

Diplomat of the American Board of Neurological Surgeons

### EDUCATIONAL HONORS AND AWARDS

- Orange County Medical Association Physician of Excellence Award 2017-2019
- SuperDoctors Rising Star 2018-2019
- Michael L.J. Apuzzo Research Award for Creativity and Innovation, 2011
- Medtronic Fellow in Stereotactic and Functional Neurosurgery, 2010-2011
- Johns Hopkins Medical School Dean's Summer Research Fellowship to study neurophysiology in lab of Dr. Frederick Lenz, 2002
- Johns Hopkins Manfred Mayer Scholarship Recipient, 2003-2004
- USC Phi Beta Kappa
- USC Summa Cum Laude Graduate (3.97 GPA)
- USC Presidential Scholarship, 1997-2001
- USC Dean's List, 1997-2001
- Robert C. Byrd Merit Scholarship, 1997-2001
- American Heart Association Research Fellowship at Stanford Medical School, 1999
- USC Alumni Association Scholarship, 1997

### PATENTS

- "AUTOMATED TRAJECTORY PLANNING FOR STEREOTACTIC PROCEDURES." Application number PCT/US2011/067947.

### RESEARCH ACTIVITIES

- Principal investigator, MeRT for Posttraumatic Stress Disorder, Del Mar, CA
- Site Primary investigator, St. Jude SUNBURST study
- Investigator for Clinician-Initiated Study, Computerized Spinal Cord Stimulation Atlas, Sponsored by St. Jude Medical

#### PEER-REVIEWED ARTICLES

- Success Using Neuromodulation With BURST (SUNBURST) Study: Results From a Prospective, Randomized Controlled Trial Using a Novel Burst Waveform. (2018) Deer T, Slavin KV, Amirdelfan K, North RB, Burton AW, Yearwood TL, Tavel E, Staats P, Falowski S, Pope J, Justiz R, Fabi AY, **Taghva A**, Paicius R, Houden T, Wilson D. *Neuromodulation*. 2018 Jan;21(1):56-66.
- **Taghva A**, Karst E, Underwood P. (2017) Clinical Paresthesia Atlas Illustrates Likelihood of Coverage Based on SCS Electrode Placement. *Neuromodulation*. 2017 Aug;20(6):582-588.
- **Taghva A**, Silvetz R, Ring A, Kim KY, Murphy KT, Liu CY, Yin J. (2015) Magnetic Resonance Therapy Improves Clinical Phenotype and EEG Alpha Power in Posttraumatic Stress Disorder. *Trauma Monthly* Nov;20(4):e27360.
- **Taghva A**, Romer J, Barolat G (2015). Intraoperative electromyography as an adjunct to sacral neuromodulation for pelvic pain. *Neuromodulation*, Jan;18(1):62-6.
- **Taghva A**, Karst E, Underwood P. Clinical Paresthesia Atlas Illustrates Likelihood of Coverage Based on SCS Electrode Placement. In preparation.
- **Taghva A**, Jin T, Ring AR, Liu CY, Jin Y. Biometric-Guided MeRT for Posttraumatic Stress Disorder: a randomized, double-blind, controlled trial. In preparation.
- **Taghva A** (2014). Anterograde and Retrograde Epidural Paddle Placement Through a Single Laminotomy for the Treatment of Back and Lower Extremity Pain Using Spinal Cord Stimulation: Case Reports and Technical Note. *Neuromodulation*. Epub ahead of print, Feb 2014
- Lenz FA, **Taghva A**, Fernandez A, Weiss N (2013). Thalamic Bursting Activity, Chronic Pain. In: *Encyclopedia of Pain*.
- **Taghva A**, Oluigbo C, Corrigan J, Rezai AR (2013). Posttraumatic stress disorder: Neurocircuitry and implications for potential deep brain stimulation. *Stereotactic and Functional Neurosurgery*, 2013, Mar 26;91(4):207-219.
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- **Taghva A**, Corrigan J, Rezai AR (2012). Obesity and brain addiction circuitry: implications for deep brain stimulation. *Neurosurgery*, 2012, Aug. 71(2) 224-38.
- **Taghva AS**, Malone DA, Rezai AR (2012). Deep Brain Stimulation for Treatment-Resistant Depression. *World Neurosurgery*, Oct 27, S1878-8750(12)01242-9.
- Robison A, **Taghva A**, Liu CY, Apuzzo MLJ (2012). "Surgery of the Mind, Mood, and Conscious State: An Idea in Evolution." *World Neurosurgery*, May; 77(5-6):662-86.
- **Taghva A**, Zada G, Khalessi AA, Hsieh PC (2012). "Minimally Invasive Posterior Atlantoaxial Fusion: A Cadaveric and Clinical Feasibility Study." *World Neurosurgery*, Jan 30 2012.
- Tsai A, Chen DM, Lin M, Hsieh JCF, Okitsu CY, **Taghva A**, Shibata D, Hsieh CL (2012). Heterogeneity and Randomness of DNA Methylation Patterns in Human Embryonic Stem Cells. *DNA and Cell Biology*, 2012 Jun;31(6):893-907.
- **Taghva A**, Corrigan J, Rezai AR (2012). Neuromodulation for anorexia nervosa and other eating disorders: current neurocircuitry models and the state of the art in deep brain stimulation. Manuscript in preparation.
- Stapleton CJ, Moldavskiy P, **Taghva A**, Hsieh PC (2012). "Monostotic Fibrous Dysplasia of the Thoracic Spine: Case Report and Review of the Literature." *In press, Journal of Neurosurgery: Spine*.
- Malone HR, **Taghva A**, Zarrabi G, Hsieh PC (2011). "Pigmented Villonodular Synovitis of the Atlantoaxial Articulation: Gross Total Resection in Two Stages." Manuscript in preparation.
- **Taghva A**, Song D, Hampson RE, Deadwyler SA, Berger TW (2011). "Determination of relevant neuron-neuron connections for neural prosthetics: Time-delayed mutual information for detection of functional connectivity in the rat hippocampus." *World Neurosurgery*, epub ahead of print Nov 4.

- **Taghva A** (2011). Hidden semi-Markov Models in the Automated Decoding of Microelectrode Recording Data for Deep Brain Stimulator Placement. May-Jun;75(5-6):758-763.e4, *World Neurosurgery*.
- Terterov S, **Taghva A**, Khalessi A, Liu CY (2011). "Intramedullary Abscess of the Spinal Cord in the Setting of Patent Foramen Ovale: Case Report and Review of the Literature." Sep-Oct;76(3-4):361.e11-4, *World Neurosurgery*.
- Terterov S, **Taghva A**, Khalessi A, Hsieh PC (2011). "Symptomatic Vertebral Artery Compression by the Rod of a C1-C2 Posterior Fusion Construct: Case Report and Review of the Literature." *Spine*, Jan 25. [Epub ahead of print].
- **Taghva A** (2010). An Automated Navigation System for Deep Brain Stimulator Placement using Hidden Markov Models. *Neurosurgery* 66(3 Suppl Operative):108-17.
- **Taghva A**, Li KW, Liu JC, Gokaslan ZL, Hsieh PC (2010). Minimally invasive circumferential decompression and stabilization for symptomatic metastatic spine tumor: technical case report. *Neurosurgery* 66(3):E620-2.
- Terterov S, **Taghva A**, MacDougal M, Giannotta SL (2010). "Posttraumatic Human Cerebral Myiasis." *World Neurosurgery*. 73(5):557-559
- Ohara S, **Taghva A**, Kim JH, Lenz FR (2007). "Spontaneous low threshold spike bursting in awake humans is different in different lateral thalamic nuclei." *Experimental Brain Research*. 180:281-8.
- Sciubba DM, Garonzik IM, Suk I, Gallia GL, Tufaro A, Wolinsky JP, **Taghva A**, Gokaslan ZL (2006). Frameless stereotaxy in a transmandibular, circumglossal, retropharyngeal cervical decompression in a Klippel-Feil patient: technical note. *European Journal of Spine*. 15(8):1286-91
- Yu K, **Taghva A**, Ma Y, Lieber MR (2004). "Kinetic analysis of the nicking and hairpin steps in V(D)J recombination." *DNA Repair*. 3:67-75.
- **Taghva A**, Ma Y, Lieber MR (2002). "Analysis of the Kinetic and Equilibrium Binding of Ku Protein to DNA." *Journal of Theoretical Biology*. 214: 85-97.
- Yu K, **Taghva A**, Lieber MR (2002). "The cleavage efficiency of the human immunoglobulin heavy chain VH elements by the RAG complex: implications for the immune repertoire." *Journal of Biological Chemistry* 277: 5040-5046.
- Lin IG, Han L, **Taghva A**, O'Brien LE, Hsieh CL (2002) "Murine de novo methyltransferase Dnmt3a demonstrates strand asymmetry and site preference in the methylation of DNA in vitro." *Molecular and Cellular Biology*. 22: 704-23.

#### BOOK CHAPTERS AND REVIEW ARTICLES

- Yeremeyeva E, **Taghva A**, Rezai AR. "Seeking new solutions: stimulation of diseased circuits in depression and other neurobehavioral disorders." *Clin Neurosurg*. 2012;59:44-9.
- Pham, M, **Taghva A**, Rezai AR. (2013) "Brain Machine Interface and Rehabilitation." In: Textbook of Nanoneuroscience and Nanoneurosurgery. Ed Kateb B, Heiss J. CRC Press.
- **Taghva A**, Hoh DJ, Laruyssen CL(2012). "Advances in the management of spinal cord and spinal column injuries." *Handbook of Clinical Neurology*, 2012;109:105-30.
- **Taghva A**, Oluigbo C, Szapiel M, Rezai A (2010). "Deep brain stimulation for neurobehavioral conditions." In preparation, International Journal of Neuroscience.
- **Taghva A**, Oluigbo C, Rezai AR (2010). "Deep brain stimulation: Current Applications and New Frontiers." *Principles of Neurosurgery, 2nd Edition*, Ed. Ellenbogen.
- Oluigbo CO, Szapiel M, **Taghva A**, Rezai AR. Motor Cortex Stimulation. In *Comprehensive Treatment of Chronic Pain by Medical, Interventional, and Behavioral Approaches: The AMERICAN ACADEMY OF PAIN MEDICINE Textbook on Patient Management*. Edited by Timothy R. Deer, MD.
- **Taghva A**, Liu CY, Apuzzo MLJ (2010). "Transcallosal Surgery of Lesions Affecting the Third Ventricle: Basic Principles." In press, Schmidek & Sweet Operative Neurosurgical Techniques, 6<sup>th</sup> ed., Elsevier.
- **Taghva A** (2010). Of minds and machines: applications of artificial intelligence to neurosurgery. *World Neurosurgery*.
- **Taghva A**, Kim PE, Liu CY, Apuzzo MLJ (2010). "Molecular Imaging: Apertures into the Landscape of Genomic Medicine." *World Neurosurgery*. 73(4):307-316.

- **Taghva A**, Liu CY, Kim PE, Apuzzo MLJ(2010). "From Atom to Brain: Applications of Molecular Imaging to the Clinical Neurosciences." *World Neurosurgery*. 73(5):477-485
- **Taghva A.**, Patel S.H., Fernandez A., Weiss N., Lenz. F.A (2007). Thalamic Bursting Activity, Chronic Pain. In 'Thalamus and Pain' (V. Apkarian, Sect. Ed.) from 'Encyclopedia of Pain.' Eds. R Schmidt and WD Willis. Springer Verlag:Berlin. 2410-2412.
- **Taghva A.**, Patel S.H., Fernandez A., Weiss N., Lenz F.A (2007). Central pain, human studies of Physiology. In 'Central Pain' from 'Encyclopedia of Pain.' Eds. R Schmidt and WD Willis. Springer Verlag:Berlin. 324-326.

#### ABSTRACTS, PRESENTATIONS, INVITED TALKS

- **Taghva A** (2018) Spinal Cord Stimulation: Evidence and Applications. Invited talk, Congress of Neurological Surgeons Annual Meeting.
- **Taghva A** (2017) Spinal Cord Stimulation: Evidence and Applications. Invited talk, Congress of Neurological Surgeons Annual Meeting.
- **Taghva A**, Karst E, Underwood P (2014). "Clinical Paresthesia Atlas Illustrates Likelihood of Coverage Based on SCS Electrode Placement." Oral presentation, AANS annual meeting, Washington, DC, 2014.
- **Taghva A**, Silvetz R, Ring A, Kim A, Liu CY, Ji Y (2014). "Magnetic Resonance Therapy Improves Disease Phenotype and EEG Alpha Power in Posttraumatic Stress Disorder." Poster, AANS annual meeting, Washington DC, 2014.
- Kim KA, **Taghva A**, Jin Y, Liu CY. Improved autism behaviors after noninvasive cerebral transcranial magnetic stimulation using customized frequency modulation: follow-up mean 24 months. AANS Annual Meeting, San Francisco, April 2014.
- Kim KA, **Taghva A**. Versatility and accuracy of intraoperative surface registration for spinal navigation and instrumentation in 50 consecutive revision operations. AANS Annual Meeting, San Francisco, April 2014.
- **Taghva A**, Karst E, Underwood P (2014). "Clinical Paresthesia Atlas Illustrates Likelihood of Coverage Based on SCS Electrode Placement." Oral presentation, NANS annual meeting, Las Vegas, 2014.
- Pallavaram S, **Taghva A**, Goble T, D'Haese P, Konrad P, Rezai A (2012). "Correlating Statistical Maps of Contraction due to Stimulation and the Optimal Implant Position for Subthalamic Deep Brain Stimulation with the Anatomy." Oral presentation, AANS annual meeting 2012.
- S. Pallavaram, P.-F. D'Haese, T. Goble, P. Agrawal, **A. Taghva**, K. Philip, E. Yermeyeva, C. Kao, J. S. Neimat, A. Rezai, P. E. Konrad, and B. M. Dawant, "Value of multi-center collaboration towards building more complete electrophysiological atlases using non-rigid image registration," in American Society for Stereotactic and Functional Neurosurgery (ASSFN) biennial meeting San Francisco, CA, USA, 2012.
- T. Goble, S. Pallavaram, P.-F. D'Haese, **A. Taghva**, C. Oluigbo, K. Philip, H. Chen, P. Agrawal, E. Yermeyeva, N. Vilelli, B. M. Dawant, and A. Rezai, "Macrostimulation during STN DBS surgery: Guidance for final implant position with respect to the motor internal capsule," in American Society for Stereotactic and Functional Neurosurgery (ASSFN); Biennial Meeting. San Francisco, CA, USA, 2012 June.
- P.-F. D'Haese, S. Pallavaram, T. Goble, C. Oluigbo, P. Agrawal, **A. Taghva**, K. Philip, C. Kao, J. S. Neimat, A. Rezai, P. E. Konrad, and B. M. Dawant, Value of multi-center collaboration towards building electrophysiological atlases," in Proc. of the Workshop on Deep Brain Stimulation Methodological Challenges (DBSMC), Med Image Comput Assist Interv (MICCAI), Nice, France, 2012.
- **Taghva A**, Attenello F, Khalessi A, Hsieh PC (2010). Minimally invasive C1-2 posterior spinal fusion. Eposter, 2012 AANS Annual Meeting.
- **Taghva A**, Song D, Berger TW (2010). "Time-delayed mutual information for detection of information transfer between CA3 and CA1 neurons in the rat hippocampus: Implications for neural prosthetic design." Eposter, Congress of Neurological Surgeons Annual Meeting, 2010.

- Terterov S, **Taghva A**, Khalessi A, Hsieh PC (2010). Symptomatic Vertebral Artery Compression by the Rod of a C1-C2 Posterior Fusion Construct: Case Report. Oral presentation, 2010 AANS Annual Meeting.
- **Taghva A** (2010). Automated Decoding of Microelectrode Recording Data for Deep Brain Stimulator Placement using Hidden Semi-Markov Models. Eposter, 2010 AANS, CNS Annual Meetings.
- **Taghva A**, Terterov S, Russin J, Sung G, Giannotta SL (2010). Factors Contributing to Increased Midline Shift Following Ventriculostomy Placement in Spontaneous Supratentorial Intracerebral Hemorrhage. Eposter, 2010 AANS Annual Meeting.
- **Taghva A**, Terterov S, Russin J, Gruen JP, Giannotta SL (2010). Primary Decompressive Craniectomy in the Management of Blunt Head Trauma: A Preliminary Retrospective Review. Eposter, 2010 AANS Annual Meeting.
- **Taghva A**, Song D, Berger TW (2009). "Time-delayed mutual information versus cross-correlation in the detection of information transfer between CA3 and CA1 neurons in the rat hippocampus." Abstract at Society for Neuroscience Meeting, 2009.
- **Taghva A** (2009). Automated Intraoperative Navigation for Deep Brain Stimulator Placement: A Hidden Markov Model Based Prototype System Using Microelectrode Recording Data. Oral poster, Congress of Neurological Surgeons Annual Meeting Forum on Stereotactic and Functional Neurosurgery 2009.
- **Taghva A**, Zada G, Khalessi A, Hsieh PC(2009). Minimally Invasive Posterior Atlantoaxial Fusion: A Pilot Cadaveric and Clinical Study. Digital poster at Congress of Neurological Surgeons Annual Meeting 2009.
- **Taghva A**, Terterov S, Russin J, Giannotta SL (2009). Primary Decompressive Craniectomy in the Management of Blunt Head Trauma: A Preliminary Retrospective Review. Digital poster at Congress of Neurological Surgeons Annual Meeting 2009.
- Hsieh PC, **Taghva A**, Gallia G, Sciubba D, Wolinsky JP, Gokaslan ZL(2009). En-bloc resection of chordomas in the cervical spine: Review of 5 consecutive patients with mean follow-up of over 4 years. Digital poster at Congress of Neurological Surgeons Annual Meeting 2009.
- Hsieh PC, **Taghva A**, Gokaslan ZL, Liu JC(2009). Posterolateral approach for corpectomy with circumferential decompression and instrumented fusion using expandable cages: A prospective case series of 15 consecutive patients. Digital poster at Congress of Neurological Surgeons Annual Meeting 2009.
- **Taghva A**, Winer J, Hoh DJ(2009). Serum markers predictive of positive MRI for spinal infection in patients evaluated in the emergency department. Poster at AANS/CNS Section on Disorders of the Spine and Peripheral Nerves 2009 meeting.
- Bristol RE, **Taghva A**, Krieger MD, McComb JG (2008). Primary Spinal Cord Astrocytomas in the Pediatric Population. 2008 International Symposium on Pediatric Neuro-Oncology.
- **Taghva A**, Kim KA, Russin J, Giannotta SL (2007). Use of Cerebral Oxygenation Monitoring as a guide to Triple-H therapy for SAH-induced vasospasm: Preliminary Report. Abstract, 2007 Congress of Neurological Surgeons.
- Kim KA, McDonald M, Pik JHT, **Taghva A**, Wang MY (2007). Dynamic Intraspinous Spacer Technology (DIAM) for Posterior Dynamic Stabilization: clinical and radiographic mean 29 month follow-up. Abstract, April 2007 American Association of Neurological Surgeons Meeting.
- Sciubba DM, **Taghva A**, Garonzik IM, Samdani AF, Suk I, Gokaslan SL (2007). Frameless Navigation in Transmandibular, Circumglossal, Retropharyngeal Cervical Decompression of Klippel-Feil Patients: Technical Note. Abstract April 2007 American Association of Neurological Surgeons Meeting.
- Kim KA; Wang MY; Ledezma CJ; **Taghva A**; Nicholas D; Wykoff. R. MR-Myelogram for Detection of Lumbar Facet Synovial Fluid Abnormalities and Predicting Positive Response to Facet Injection (2007). Select Abstract CNS 2006 Annual Meeting Chicago.

## PROFESSIONAL ACTIVITIES



- Consultant for Nevro and Abbott Medical in Neuromodulation.
- Spine surgery consultant for Nuvasive
- Fellows courses on spine surgery and spinal cord stimulation for Boston Scientific, Nevro, and Nuvasive.
- Editorial board, Prior Section Editor, *World Neurosurgery*.
- Reviewer, *World Neurosurgery*, *Brain Stimulation*.
- *Ad hoc* reviewer, *Neurosurgery*, *Stereotactic and Functional Neurosurgery*, *Neuromodulation*, *Movement Disorders*, *Journal of Neural Engineering*, *Transactions on Neural Systems and Rehabilitation Engineering*, 2011 AANS meeting, 2011 INS meeting.
- Team physician, USC Trojan Football Team, 2009-2010 season.

#### **OUTSIDE ACTIVITIES**

- National champion junior tennis player. Featured in *Sports Illustrated's* "Faces in the Crowd", March 20, 1995.
- Gave piano performance jury recitals with "A" grades under tutelage of Dr. Radek Materka at the University of Southern California Thornton School of Music.