

## **CURRICULUM VITAE**

**SAMAN HAZANY, MD**

**10/10/2019**

### **PERSONAL INFORMATION:**

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**Citizenship:** USA

### **EDUCATION AND PROFESSIONAL APPOINTMENTS**

#### **EDUCATION:**

- 06/2002 BS, Neuroscience, University of California Los Angeles. Los Angeles, CA
- 06/2006 MD, Medicine, University of California San Diego School of Medicine. San Diego, CA

#### **POST-GRADUATE TRAINING:**

- 2006-2007 Preliminary Internal Medicine internship, Martin Luther King Hospital. Los Angeles, CA
- 2007-2009 Radiology residency, Staten Island University Hospital; Staten Island, NY
- 2009-2011 Radiology residency, Harvard University; BIDMC; Boston, MA
- 2011-2012 Neuroradiology fellowship, University of Southern California (USC); Los Angeles, CA

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#### **ACADEMIC APPOINTMENTS:**

2018- Present	Associate Professor	Radiology, Keck School of Medicine of USC. Los Angeles, CA
2012- 2018	Assistant Professor	Radiology, Keck School of Medicine of USC. Los Angeles, CA

#### **CLINICAL APPOINTMENTS:**

2018 - Present	Attending neuroradiologis	Radiology, <u>West Los Angeles VA</u> , Los Angeles, CA
2012 – present	Attending neuroradiologist	Radiology, <u>USC (LAC-USC /Keck Hospital of USC)</u> , Los Angeles, CA
2015-present	Attending neuroradiologist	Radiology, <u>Kaiser Permanente Medical group</u> , Los Angeles, CA
2012 - 2018	Director of Neuroradiology	Radiology, <u>Rancho Los Amigos National Rehabilitation Center (RLANRC)</u> , Downey, CA

#### **ADVISORY APPOINTMENT:**

2017- ongoing	Scientific advisor	Neurodetect, Los Abgeles, CA
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#### **ADMINISTRATIVE APPOINTMENTS:**

2014-2015	Chair	RLANRC CME committee, Downey, CA
2013-2015	Member	RLANRC IRB committee, Downey, CA
01/17- 04/18	Director	RLANRC Utilization Management, Downey, CA

### **LICENSURE, CERTIFICATIONS**

#### **LICENSURE:**

7/01/2008-9/30/2019	A104684, CA, Active
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#### **BOARD CERTIFICATIONS:**

2011	American Board of Radiology, Active
2013	Neuroradiology CAQ Certification, Active

#### **HONORS, AWARDS:**

2015	Whittier Foundation Award
2006	Honored by Dr. John Hesselink (UCSD Department of neuroradiology)
2003	UCSD Medical Student NIH medical research award

- 2001 UCLA Undergraduate Research Scholarship Award
- 2001 Recognition of Outstanding Scholastic Achievement, Golden Key National Honor Society

**TEACHING**

**UNDERGRADUATE, GRADUATE AND MEDICAL STUDENT (OR OTHER) MENTORSHIP:**

2018- present	Multiple Medical Students	UCLA	DTI
2016-2018	Michael Repajic, BS		Computer Aided Detection for Epilepsy Imaging, Clastrum and Epilepsy
2016-present	Brittany DeClouette (med student)	Keck Medical School of USC	DTI, Ketogenic diet and Epilepsy
2015-2016	Esolene He (Graduate student)	USC School of Engineering	Computer Aided Detection for Epilepsy Imaging
2011-2013	Multiple Medical Students	Harvard Medical School	Radiology

**POSTGRADUATE MENTORSHIP:**

2016-Present	Multiple UCLA radiology residents
2012-Present	Multiple USC radiology residents and neuroradiology fellows

**SERVICE**

2014-2015	Hospital representative; Radiology Equipment Selection Committee	Department of Health Services, Los Angeles, CA
2014-2015	Hospital Representative; diagnostic services sub-committee	Department of Health Services, Los Angeles, CA RLANRC , Downey, CA - Implemented advanced MRI and CT
2012- 2018	Director of neuroradiology	neuro-imaging as well as robust clinical and research protocols.
2015	Intrim Chair of Radiology	RLANRC , Downey, CA

**PROFESSIONAL SOCIETY MEMBERSHIPS**

2019 – present	Member; International Society for Magnetic Resonance in Medicine (ISMRM)
2017 - Present	Member; American Society of Functional Neuroradiology (ASFNR)
2018 – Present	Member; ASFNR Research Committee
2015 - 2019	Senior Member; American Society of Neuroradiology (ASNR)
2016 - 2019	Member; Radiological Society of North America (RSNA)

**RESEARCH AND SCHOLARSHIP**

**MODERATOR AT MAJOR INTERNATIONAL MEETING:**

10/2018	ASFNR 2018	Moderator for the session: "Advanced Tumor Imaging"
10/2017	ASFNR 2017	Moderator for the session: "Advances in Spine Imaging"

**MANUSCRIPT REVIEW:**

2016 - present	Cleveland Clinic Journal of Medicine
2017 – present	Journal of Clinical Neuroscience
2017 -present	Radiology of Infectious Disease

**MAJOR AREAS OF RESEARCH INTEREST**

- Research Areas*
1. Neuroradiology (Stroke, Traumatic Brain Injury, Spinal Cord Injury)
  2. Epilepsy imaging
  3. Neurorestoration

**GRANT SUPPORT - CURRENT:**

**Current funded projects:**

**A multicenter, randomized, double-blind, Sham-controlled, comparative study of SI-6603 in subjects with lumbar disc herniation (phase 3).** Wallbom, AS (PI) 7/2018 –ongoing

A randomized, double-blind, placebo-controlled, multicenter phase III clinical trial to evaluate the efficacy and safety of chemonucleolysis with condoliase in patients with lumbar disc herniation. Role: Neuroradiologist; Co-investigator. Sponsor: Deikagaku Corporation (SKK)

**Imaging of Ketogenic Diet in Epilepsy**

Hazany/Kim (Co-PIs) 5/2017 - ongoing

To investigate potential metabolic, morphologic, and functional changes on brain MRI as result of ketogenic diet in patients with intractable epilepsy.

Role: Co-Principle investigator. Funding is for medical student involved through the "RSNA medical student research award".

**AST-OPC1-02. A Long-term Follow-up Study of Subjects with Cervical Spinal Cord Injuries Who Received AST-OPC1 in Protocol AST-OPC1- 01. Asterias Biotherapeutics, Inc.**

Liu (PI) 11/2015 - ongoing

To monitor long-term safety in subjects with cervical SCI who received injections of AST-OPC1 under the study protocol AST-OPC1-01 with variable including MRI.

Role: Co-investigator

**Selected completed and unfunded projects:****Magnetic Resonance Treatment and Robot-Assisted Rehabilitation for Cerebral Palsy**

Liu (PI) 11/2015 – 2018

Proof-of-concept study to evaluate the effects of magnetic resonance treatment (MRT) on the functional level, measured by spasticity, range of motion and other therapy measures, as well as its effects at the brain cortical level as measured by neuroimaging.

Role: Co-investigator.

**CL-SCI-201. Single-Blind, Randomized, Parallel Arm, Randomized Arm, Phase II Proof-of-Concept Study of the Safety and Efficacy of HuCNS-SC Transplantation in Cervical Spinal Cord Injury. Stem Cell Inc.**

Liu (PI) 05/2014 – 2018

To assess efficacy of cervical spinal intramedullary transplantation of HuCNS-SC cells in AISA A subjects with cervical spinal cord injury (cSCI). To assess the safety of cervical intramedullary transplantation of HuCNS-SC cells in subjects across all cohorts of the study.

Role: Co-investigator

**AST-OPC1- 01. A Phase 1/2a Dose Escalation Study of AST-OPC1 in Subjects with Cervical Sensorimotor Complete Spinal Cord Injury. Asterias Biotherapeutics, Inc.**

Liu (PI) 03/2015 - 2018

Evaluate the safety of 3 sequential escalating doses of AST-OPC1 administered at a single time-point between 14 and 30 days post-injury, inclusive, to subjects with sensorimotor complete cervical spinal cord injury (c-SCI). Evaluate changes in neurological function and MR imaging following the administration of AST-OPC1.

Role: Co-investigator

**Nexstim Stroke Trial (Niche): Navigated Inhibitory rTMS to Contralesional Hemisphere Trial.**

Liu (PI) 9/2014 – 2018

Pivotal Phase III, Prospective, Multi-Center, Double-Blinded, Randomized, Sham-Controlled Trial to Determine the Therapeutic Effects of Navigation Guided 1 HZ rTMS Administered to the Contralesional Hemisphere as Adjuvant to Task-Oriented Rehabilitation in Patients with Ischemic or Hemorrhagic Stroke.

Role: Co-investigator

**Mindfulness training in traumatic brain injury: Targeting adaptive neuroplasticity and cognitive improvement.**

Hazany (PI) 10/2014 - 2018

To investigate effects of mindfulness training on neuroplasticity and cognitive function of subjects with prior moderate to severe traumatic brain injury. The subjects will undergo Electroencephalography (EEG), Magnetic Resonance Imaging (MRI), and neuropsychiatric testing before and after eight weeks of mindfulness training.

Role: Principle investigator

**Potential Changes in Neuro-imaging as Result of Robotic Rehabilitation in Patients with Hemispherectomy.****Whittier Foundation Award**

Hazany/Law (Co-PIs) 09/2015 – 09/2016

To investigate effect of robotic rehabilitation in children with hemispherectomy through sophisticated neuroimaging techniques including cortical thickness measurement on structural imaging and structural and functional connectivity measurement on Diffusion Tensor Imaging (DTI) and resting state fMRI.

Role: Co-PI

### **Epilepsy imaging interpretation and Computer Aided Detection.**

Hazany/Leahy (Co-PIs)

9/2014 – 2018

To develop an algorithm that detects cortical dysplasias, migrational abnormalities, incomplete hippocampal inversion, and medial temporal sclerosis on epilepsy MRI and compare its accuracy to epilepsy-expert neuroradiologist interpretation, non-epilepsy-expert neuroradiologist, and general radiologist.

Funding: None

### **Effect of Non-Invasive Electrical Spinal Cord Stimulation on Central Nervous System**

Hazany/Edgerton (Co-PIs)

9/2014 – 2018

To investigate potential imaging changes on brain and Cervical spinal cord MRI and fMRI as result of non-invasive electrical spinal cord stimulation in patients with spinal cord injury.

Funding: None

### **PUBLICATIONS:**

#### **Peer-reviewed publications**

\*signifies my role as primary supervisor of trainee author on this project.

#### **Original articles:**

1. **Hazany S**, Go JL, Law M. Magnetic resonance imaging of infectious meningitis and ventriculitis in adults. *Top Magn Reson Imaging*. 2014 Oct; 23(5):315-25.
2. Sivasundaram L, **Hazany S**, Wagle N, Zada G, Chen TC, Lerner A, Go JL, D'Amore F, Law M, Shiroishi MS. Diffusion restriction in a non-enhancing metastatic brain tumor treated with bevacizumab - recurrent tumor or atypical necrosis? *Clin Imaging*. 2014 Sep-Oct;38(5):724-6.
3. **Hazany S**, Rojas R, Moonis G. Imaging features of Lipodystrophy of HIV (LDHIV) in the head and neck. *International Journal of Otolaryngology and Head & Neck Surgery*, Vol. 1 No. 2, 2012, pp. 24-27. doi: 10.4236/ijohns.2012.12005.
4. Colen RR, Zinn PO, **Hazany S.**, Do-Dai D, Wu JK, Yao K, Zhu JJ. MRI Appearance and Changes on Intracavitary Gliadel Wafer Placement: A Pilot Study. *World J Radiol*. 2011 Nov 28;3(11):266-72.
5. Isaacs D, **Hazany S**, Gamst A, Stark P, Mahmud E. Evaluation of the Coronary Sinus by Computed Tomography (CT) in Patients with Elevated Right Heart Pressures. *J Comput Assist Tomogr*. 2009 Jul-Aug; 33(4):513-6.
6. **Hazany S**, Khalkhali I. The Impact of Mammography in a Public University Affiliated Hospital in an Urban Community. *Breast J*. 2009 May-Jun; 15(3):318-20.
7. Elsas SM, **Hazany S**, Gregory WL, Mody I. Hippocampal zinc infusion delays the development of afterdischarges and seizures in a kindling model of epilepsy. *Epilepsia*. 2009 Apr; 50(4):870-9.
8. **Hazany S**, Pham HA, Vatakencherry G. A Case of Transection at the Strut of a Gore Tag Endograft After Endovascular Repair of a Ruptured Thoracic Aorta. *J Vasc Interv Radiol*. 2009 Feb; 20(2):271-4.
9. Villablanca JP, Rodriguez FJ, Stockman T, Dahliwal S, Omura M, **Hazany S**, Sayre J. Detection and Quantization of Small Intracranial Arteries Using Multidetector Helical CT Angiography: Comparison to Conventional Catheter Angiography. *AJR Am J Roentgenol*. 2007 Feb; 188(2):593-602.
10. **Hazany S**, Hesselink JR, Healy JF, Imbesi SG. Utilization of Glutamate/Creatine Ratios for Proton Spectroscopic Diagnosis of Meningiomas. *Neuroradiology*. 2007 Feb; 49(2):121-7.

#### **Book Chapters:**

1. Jacokes, Z., Bhattra, A., Torgerson, C., Zywiec, A., Abe, S., Irimia, A., Law, M., **Hazany, S.**, and Van Horn, J.D. (2016) Chapter 12: "The Neuroimaging Challenges in Hemispherectomy Patients" in Mark J. Ashley and David A. Hovda, *Traumatic Brain Injury; Rehabilitation, treatment, and Vase Management 4<sup>th</sup> Edition*, Springer.
2. **Hazany S**, Go J, Henderson RW, Kim P, Law M. (2016). Chapter 12: *Neuroradiology: Neoplasms and Epilepsy*. In Conti, Peter S., Kaushik, Aarti "PET-CT -- A Case-Based Approach" (pages 207-224). Springer Science + Business Media LLC New York.
3. Haddadin Z, Huang J, **Hazany S**. (2019). Chapter 15: *Neuroimaging – Structural and Functional*. In Blessen C. Eapen "Brain Injury Medicine" Elsevier | Education, Reference, and Continuity. Maryland Heights, MO 63043

#### **Online publications:**

- \*1. Nwosu K, Beck A, Rolfe K, **Hazany S**. Calcium pyrophosphate dehydrate crystal deposition disease of the lumbar spine. *American College of Radiology Case in Point*; 08/11/2015. <https://3s.acr.org/CIP/>
- \*2. Hogg E, Shaw S, **Hazany S**. Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL). *American College of Radiology Case in Point*; 10/04/2016. <https://3s.acr.org/CIP/>

- \*3. Sue M, Mokhtar P, Huang J, Hazany S. Piriformis syndrome caused by split piriformis muscle. American Journal Of Neuroradiology (AJNR) case of the week; (accepted for publication in 2019)
4. Tsui B, Hazany S, Huang J, Hathout G. Congenital absence of the right superior oblique muscle. American Journal Of Neuroradiology (AJNR) classic case; (accepted for publication in 2019)

#### ABSTRACTS AND PRESENTATIONS:

- \*1. DeClouette B, **Hazany S**, Is Fractional Anisotropy of The Superior Longitudinal Fasciculus a Helpful Imaging Marker for Lateralizing the Seizure Focus? American Society of Functional Neuroradiology (ASFNR) 2017
2. Torgerson CM, Bhattarai A, Jacokes ZJ, Law M, **Hazany S**, Irimia A, Van Horn JD. Multimodal neuroimaging of brain structure alterations in adolescents with anatomic hemispherectomy. Organization for Human Brain Mapping (OHBM) 2016 (OHBM) 2016
3. Shaw S, Chu R, Blydt-Hansen, E, **Hazany S**, Mann, D, Clark K, Aisen M. Intensive robot-assisted rehabilitation improves motor function in children after cerebral hemispherectomy. American Academy of Neurology (AAN) 2015.
4. Shaw S, Chu R, Kasayama J, Blydt-Hansen E, **Hazany S**, Aisen M. Intensive robot-assisted therapy improves motor function post-cerebral hemispherectomy. World Conference for Neurorehabilitation (WCNR) 2016.
5. Torgerson C, Bhattarai A, JJ Zachary, Law M, **Hazany S**, Irimia A, Van Horn JD. Multimodal neuroimaging of brain structure alterations in adolescents with anatomic hemispherectomy. Human Brain Mapping Annual Meeting, 2016.
6. Mann D.S., Krafnick A., Shaw S., Chu Jr. R., Aisen M., **Hazany S.**, Clark K. A., Longitudinal Cortical Changes with Motor Rehabilitation in Hemispherectomy Patients. Presented at Organization for Human Brain Mapping Annual Meeting, 2015.
7. Hwang D, Heck C, Nune G, **Hazany S**, Liu CY, Russin J, Law EM, Kim PE. 3D MR/CT Fusion for Cortical Surface Localization of Intracranial EEG Electrodes Using Synapse 3D. RSNA, 2015.
8. **Hazany S**, Mann D, Aisen M, de Bode S, Shaw S, Clark K. Changes in Neuroimaging as Result of Robotic Rehabilitation in Patients with Hemispherectomy. American Society of Neuroradiology (ASNR), 05/2015.
9. Kim PE, **Hazany S**, Liu C, Heck C, Millett D, Ko D, Lerner A, Rajamohan A, Shiroishi M, Go JL, Boyko O, Henderson R, Law M. Holy grails of epilepsy imaging: the "nonlesional" patient, multifocal and extratemporal epilepsy. American Society of Neuroradiology (ASNR), 05/2013.
10. Sivasundaram L, **Hazany S**, Wagle N, Zada G, Chen T, Pagnini P, Lerner A, Law M, Shiroishi MS. Diffusion Restriction in Non-Enhancing Metastatic Brain Tumors Treated with Bevacizumab - Recurrent Tumor or Necrosis? Western Neuroradiology Society (WNRS), 2012.
11. **Hazany S**; Christian S; Rahmanuddin S; Martinez M; Florence Hofman; Cen Yong; Izadi K; Ferré J-C, Shiroishi MS; Rajamohan A, Go J; Law M. Regional definition of high grade glioma by using 3D imaging volume intensity histogram analysis. American Society of Neuroradiology (ASNR), 04/2012.
12. **Hazany S**; Christian S; Rahmanuddin S; Izadi K; Cen Yong; Martinez M; Aguilera AL, Kim MJ; Shiroishi MS MD; Rajamohan A MD, Kim P MD; Law ME MD. 3-D volume intensity histogram analysis to differentiate between tumor recurrence and radiation necrosis in patients who have undergone resection and radiation therapy for metastatic brain. American Society of Neuroradiology (ASNR), 04/2012.
13. **Hazany S**, Mehrpoo NN, Shiroishi M, Klipfel N, Bishop WD, Go JL. A case of ameloblastic carcinoma of the maxillary sinus. Review of imaging and pathology as well as brief review of the literature. American Society of Head and Neck Radiology (ASHNR), 09/2011.
14. Colen RR, **Hazany S**, Zinn PO, Jolesz FA, Rojas R. Neurosurgical "Golden Rule" for Brain Tumors In the Era of Modern Neuronavigational Stereotactic Neurosurgery and Functional MR Imaging: Relevance and Redefinition. RSNA, 2010.
15. **Hazany S**, Colen RR, Parva P, Bhadelia R, Riascos R, Rojas R., Interactive 2-and 3-dimensional Anatomic Atlas of the Human Brain white matter based on fiber tractography and diffusion tensor color maps. RSNA, 2010.
16. Colen RR, **Hazany S**, Nazir K, Zinn PO, Do-Dai D, Wu J, Zhu J. Glioblastoma Multiforme: A Study on the Radiographic Appearance and Changes on Intracavitary Gliadel Wafer Placement. ASNR, Boston, MA May 2010.
17. **Hazany S**, Telishack N, Colen R, Bhadelia R, Riascos R, Rojas R. Language Processing in Bilinguals: An fMRI study. ASNR 2011.
18. **Hazany S**, Telishack N, Colen R, Parva P, Bhadelia R, Riascos R, Rojas R. Do you know your white matter tracts? Fiber Tractography and Diffusion Tensor Color Maps of Human Brain White Matter: An Interactive Anatomic Atlas in Quiz format. ASNR 2011
19. **Hazany S**, Rojas R, Moonis G. Imaging features of Lipodystrophy of HIV (LDHIV) in the head and neck. American Society of Neuroradiology (ASNR), 05/2010.
20. Colen RR, **Hazany S**, Zinn PO, Rojas R. Functional MRI (fMRI) and the Neurosurgical "Golden Rule" for brain tumors: Is the "Golden Rule" relevant today? American Society of Neuroradiology (ASNR), 05/2010.
21. Colen RR, **Hazany S**, Nazir K, Zinn, PO, Do-Dai D, Wu J, Zhu J. Glioblastoma Multiforme: Radiographic appearance and changes on intracavitary Gliadel Wafer Placement. American Society of Neuroradiology (ASNR), 05/2010.
22. Guelfuat M, **Hazany S**, Wrzolek M, Buchbinder S. Mixed Echogenicity Breast Masses: A Pictorial Review of Imaging Findings with Pathologic Correlation. American Roentgen Ray Society (ARRS); 03/2009. (One of top twenty viewed exhibits and invited for publication in AJR Integrative Imaging.)
23. Hirschorn D, **Hazany S**. Effect of Monitor Brightness Decay on DICOM Conformance. Society for Imaging 23. Gonzalez N, **Hazany S**, Zamarró J, Vinuela F. Endovascular Treatment of Intracranial Aneurysms in an Elderly Population. Report of 158 cases. Congress of Neurological Sciences (CNS); 10/2006.
24. **Hazany S**, Hesselink JR, Healy JF, Imbesi SG. Utilization of Glutamate/Creatine Ratios for Proton Spectroscopic Diagnosis of Meningiomas when Alanine is Absent or Masked by Lactate. Radiological Society of North America (RSNA); 11/2006.
25. Isaacs D, **Hazany S**, Gamst A, Stark P, Mahmud E. Evaluation of the Coronary Sinus by Computed Tomography (CT) in Patients with Elevated Right Heart Pressures. American Roentgen Ray Society (ARRS); 05/2006.
26. Santosa AC, **Hazany S**, Levin DL, Stark P. The Significance of Anterior Diaphragmatic Lymph Nodes Observed on CT. Agnes C. Santosa MD, Saman Hazany BS, Paul Stark MD. American Roentgen Ray Society (ARRS); 05/2006.