

# Shawn M. Vuong, MD

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## License and Certification

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<b>Medical License</b> (10990) – South Dakota Board of Medical & Osteopathic Examiners	July 2018 - Present
<b>Doctor of Medicine</b> (35.122276) – State Medical Board of Ohio	September 2013 - Present
<b>MD Training Certification</b> (57.021695) – State Medical Board of Ohio	October 2012 – June 2013
<b>United States Medical Licensing Exam:</b>	USMLE Step 1 - June 2010 (98) USMLE Step 2CK - July 2011 (98) USMLE Step 2CS - July 2011 (PASS) USMLE Step 3 - February 2013 (80)
<b>American Board of Neurological Surgery:</b>	Written exam – March 2016 (PASS)

## Education

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<b>Fellow in Pediatric Neurosurgery, Cincinnati Children's Hospital Medical Center</b>	<b>July 2018 – July 2019</b>
Cincinnati, OH Division of Neurosurgery Cincinnati Children's Hospital Medical Center U.S. News & World Report 2 <sup>nd</sup> Best Children's Hospital 2018-2019 Fellowship Director Francesco T. Mangano	
<b>Chief Resident in Neurosurgery, University of Cincinnati Medical Center</b>	<b>July 2017 – June 2018</b>
Cincinnati, OH Department of Neurosurgery Chairman Joseph C. Cheng	
<b>Resident in Neurosurgery, University of Cincinnati Medical Center</b>	<b>July 2012 – June 2018</b>
Cincinnati, OH Department of Neurosurgery – Mayfield Clinic & Cincinnati Children's Hospital Medical Center Over 1500 logged surgical cases Experience with minimally invasive spine, open complex spine, stereotactic radiosurgery, endovascular neurosurgery, open vascular, trauma, peripheral nerve, skull-base, tumor, deep brain stimulation, epilepsy, and pediatrics	
<b>M.D., Sanford School of Medicine, University of South Dakota</b>	<b>August 2008 – May 2012</b>
Sioux Falls, SD Scholarship Pathways Program Graduate Student of the Yankton Model Program Over 1300 logged patient encounters Over 250 logged surgical cases	



**B.S., University of South Dakota**

Vermillion, SD  
Major: Biology  
*Summa Cum Laude*

**September 2004 – May 2008**

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**Professional Appointments & Employment**

**Staff Neurosurgeon, Sanford Health**

**August 2019 – Present**

Sioux Falls, SD  
Division of Neurosurgery

**Instructor of Neurosurgery, University of Cincinnati Medical Center**

**July 2012 – June 2018**

Cincinnati, OH  
Department of Neurosurgery –  
Mayfield Clinic & Cincinnati Children’s Hospital Medical Center

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**Publications**

Emmert AS, Vuong SM, Shula C, Lindquist D, Yuan W, Hu YC, Mangano FT, Goto J. Characterization of a Novel Rat Model of X-linked Hydrocephalus by CRISPR-mediated Mutation in *L1cam*. *Journal of Neurosurgery* [Accepted] 2018.

Patel SK, Vuong SM, Yuan W, Mangano FT. Anatomy and Physiology Based Magnetic Resonance Imaging in Hydrocephalus. In: Limbrick D, Leonard J, ed. *Lifelong Implications of Cerebrospinal Fluid Disorders*. 1<sup>st</sup> ed. Springer. 2017.

Gibson GL, Vuong SM, Tew JM, Bohinski RJ. Management of autonomic dysreflexia associated with Charcot spinal arthropathy in a patient with complete spinal cord injury: case report and review of the literature. *Surg Neurol Int*. 2018 May 29;9:113. doi: 10.4103/sni.sni\_287\_17. eCollection 2018. PMID:29930879

Carroll, Tackla, Vuong, Ringer, Surveillance and Screening for Intracranial Aneurysms. In Andrew J. Ringer, editor: *Intracranial Aneurysms*, UK: Academic Press, 2018, pp. 85-98.

Abdelhamed ZI, Vuong SM, Hill L, Shula CS, Timms A, Beier D, Campbell K, Mangano FT, Stottmann R, Goto, J. A Mutation in *Ccdc39* Causes Neonatal Hydrocephalus with Abnormal Motile Cilia Development. *Development*. 2018 Jan 9;145(1). PMID: 29317443.

Vuong SM, Carroll CP, Tackla RD, Jeong WJ, Ringer AJ. Application of emerging technologies to improve access to ischemic stroke care. *Neurosurgical FOCUS* 42:E8–1, 2017. PMID: 28366070

Vuong SM, Jeong WJ, Morales H, Abruzzo TA. Vascular Diseases of the Spinal Cord: Infarction, Hemorrhage, and Venous Congestive Myelopathy. *Semin Ultrasound CT MR*. 2016 Oct;37(5):466-81. doi: 10.1053/j.sult.2016.05.008. Epub 2016 May 6. PMID: 27616317

Serrone JC, Tackla RD, Gozal YM, Hanseman DJ, Gogela SL, Vuong SM, Kosty JA, Steiner CA, Krueger BM, Grossman AW, Ringer AJ. Aneurysm Growth and De Novo Aneurysms during Aneurysm Surveillance. *J Neurosurg*. Dec;125(6):1374-1382. Epub 2016 Mar 11. PMID: 26967775

Vuong SM, Appelwick JE. MRSA Peritonitis Secondary to Perforation of Sigmoid Diverticulitis. *S D Med*. 2011 Nov;64(11):405, 407, 409. PMID: 22164818



Vuong SM, Holm RP. Does a stereotypical surgical personality exist? *S D Med.* 2011 May;64(5):172. PMID: 21661343

Scholl JL, Vuong SM, Forster GL. Chronic amphetamine treatment enhances corticotropin-releasing factor-induced serotonin release in the amygdala. *Eur J Pharmacol.* 2010 Oct 10;644(1-3):80-7. Epub 2010 Jul 23. PMID: 20655906

Vuong SM, Oliver HA, Scholl JL., Oliver KM, and Forster GL. Increased anxiety-like behavior of rats during amphetamine withdrawal is reversed by CRF-2 receptor antagonism. *Behavioural Brain Research*, 208 (2010) 278–281. PMID: 19958793

Lukkes J, Vuong SM, Scholl JL, Oliver H, Forster GL. Corticotropin-releasing factor receptor antagonism within the dorsal raphe nucleus reduces social anxiety-like behavior after early-life social isolation. *J Neurosci.* 2009 Aug 12;29(32):9955-60. PMID: 19675229

Forster GL, Pringle RB, Mouw NJ, Vuong SM, Watt MJ, Burke AR, Lowry CA, Summers CH, and Renner KJ. Corticotropin-releasing factor in the dorsal raphe nucleus increases medial prefrontal cortical serotonin via type 2 receptors and median raphe nucleus activity. *European Journal of Neuroscience*, Vol. 28, pp. 299–310, 2008. PMID: 18702701

## Conference Activity & Presentations

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Vuong SM & Bierbrauer K (2019). Chiari Malformation Type III. The Cincinnati Fetal Center Conference. Cincinnati Children's Hospital Medical Center. Cincinnati, OH.

Zamorano J, Vuong SM, Arthur TM, Arya R, Aungaroon G, Holland-Bouley KD, Leach JL, Greiner HM, Mangano FT. (2019). The Utility of Stereoelectroencephalography for Seizure Localization in Pediatric Patients with Drug-Resistant Epilepsy: Analysis of 52 Consecutive Cases. Oral Presentation at the Congreso De La Sociedad Española de Neurocirugía. Salamanca, Spain.

Vuong SM. (2019). The Six Chiari. The 6<sup>th</sup> Annual Advanced Practice Provider Pediatric Neurosurgery Conference. Cincinnati Children's Hospital Medical Center. Cincinnati, OH.

Peariso K & Vuong SM. (2019). Hemorrhagic Strokes. Presentation at the Pediatric Critical Care Fellows' Conference at the Cincinnati Children's Hospital Medical Center. Cincinnati, OH.

Vuong SM. (2019). Advanced Provider Session: The Six Chiari. The Winter Clinics for Cranial and Spinal Surgery. Snowmass, CO.

Lee J, Monahan S, Vuong S, Smith D, Elhadi Babiker H, Vadivelu S, van Aalst J, Hart C, deAlarcon A, Skoch J, Pan B. (2018). Endoscopic Endonasal Approach for the Resection of Nasal Dermoid Cysts with Intracranial Extension. [Abstract In Submission]. 18<sup>th</sup> Congress of International Society of Craniofacial Surgery. Paris, France.

Lee J, Monahan S, Vuong S, Smith D, Elhadi Babiker H, Vadivelu S, van Aalst J, Hart C, deAlarcon A, Skoch J, Pan B. (2018). Endoscopic Endonasal Approach for the Resection of Nasal Dermoid Cysts with Intracranial Extension. American Cleft Palate – Craniofacial Association 76<sup>th</sup> Annual Meeting. Tuscon, AZ.

Patel SK, Cass DK, Yang GL, Vuong SM, Skoch JM, Leach JL, Byars AW, Holland KD, Tenney JR, Arthur TM, Aungaroon G, Arya R, Greiner HM, Mangano FM. (2018). Short-term seizure outcomes in pediatric patients with focal drug-resistant epilepsy undergoing MRI-guided laser interstitial thermal therapy. Oral Presentation at the 47<sup>th</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery. Nashville, TN

Patel SK, Yang GL, Cass DK, Vuong SM, Skoch JM, Leach JL, Byars AW, Holland KD, Tenney JR, Arthur TM, Aungaroon G, Arya R, Greiner HM, Mangano FT. (2018). The utility of stereoelectroencephalography for seizure localization in pediatric patients with drug-resistant epilepsy: The preliminary CCHMC experience. Poster Presentation at the 47<sup>th</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery. Nashville, TN



Emmert AS, Vuong SM, Shula C, Qin S, Hu YC, Goto J, Mangano FT. (2018). CRISPR/Cas9-Based Development of progressive hydrocephaly (prh) Rat Model of Hydrocephalus. Poster presentation & Young Investigator Travel Award winner at the Hydrocephalus Association (HA) Connect 2018 Meeting. Orange County, CA.

Emmert AS, Vuong SM, Shula C, Qin S, Hu YC, Goto J, Mangano FT. (2018). CRISPR/Cas9-Based Development of progressive hydrocephaly (prh) Rat Model of Hydrocephalus. Podium presentation at the Ohio State Neurosurgical Society Annual Meeting. Columbus, OH.

Vuong SM. (2018). Advanced Provider Session: Anatomy and Radiology Review - Spine. The Winter Clinics for Cranial and Spinal Surgery. Snowmass, CO.

Vuong SM, Goto, J, Abdelhamed ZI, Mangano FT. (2018). Investigations of Biomarkers and New Medical Targets for Pediatric Hydrocephalus: Novel Rat Models of Congenital Hydrocephalus: CRISPR/Cas9-Mediated *L1CAM* & *prh* Gene Editing. Department of Neurosurgery Grand Rounds. Department of Neurosurgery of the University of Cincinnati. Cincinnati, OH.

Emmert AS, Vuong SM, Shula C, Qin S, Hu YC, Goto J, Mangano FT. (2017). CRISPR/Cas9-Based Development of progressive hydrocephaly (prh) Rat Model of Hydrocephalus. Podium Presentation at the 46<sup>th</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery. Houston, TX.

Emmert AS, Vuong SM, Shula C, Hu YC, Goto J, Mangano FT. (2017). DTI Quantification of Mild White Matter Alterations in a CRISPR/Cas9-Generated Rat Model of X-Linked Hydrocephalus. Podium Presentation at the 46<sup>th</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery. Houston, TX.

Emmert AS, Vuong SM, Shula C, Qin S, Hu YC, Goto J, Mangano FT. (2017). CRISPR/Cas9-Based Development of Novel Transgenic Rat Model of X-Linked Hydrocephalus. Top Poster Presentation at the 46<sup>th</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery. Houston, TX.

Patel SK & Vuong SM. (2017). University of Cincinnati Resident Team for the CNS Resident SANS Challenge. 2017 Annual Meeting of the Congress of Neurological Surgeons. Boston, MA.

Nasser R, Nouri A, Vuong SM, Staarmann B, Cheng JS. Pediatric Concussion. AANS Online Course for "Pediatric Trauma". 2017. <https://education.aans.org/products/pediatric-trauma>

Vuong SM, Goto, J, Shula CS, Abdelhamed ZI, Stottmann, R, Campbell K, Mangano FT. (2017). Gene expression profiling analysis of the choroid plexus in a novel mouse model of pediatric hydrocephalus. Podium presentation at the 61<sup>st</sup> Annual Meeting for the Society for Research into Hydrocephalus and Spina Bifida. St. Louis, MO.

Vuong SM & Mangano FT. (2017). The Beginnings of Experimental Hydrocephalus. Podium presentation at the 61<sup>st</sup> Annual Meeting for the Society for Research into Hydrocephalus and Spina Bifida. St. Louis, MO.

Vuong SM. (2017). Special Resident Lecture: Novel Congenital Hydrocephalus Model. Podium presentation at the Mayfield Neuroscience Symposium at the University of Cincinnati. Cincinnati, OH.

Carroll CP, Tackla RD, Vuong SM, Jeong WJ, Serrone JC, Ringer AJ. (2017). Rapid Fire Cerebrovascular Presentation: Robotically-Assisted Cerebral Angiography and Intracranial Intervention: Initial Experience with the Magellan Catheter System. Podium presentation at the AANS Annual Scientific Meeting. Los Angeles, CA.

Abdelhamed ZI, Shula CS, Vuong SM, Campbell K, Stottmann, R, Goto, J, Mangano FT. (2017). Ependymal Motile Cilia Defects Cause Hydrocephalus in the *progressive hydrocephaly (prh)* Mutant Mice. Poster Presentation at the Developmental Biology Retreat. College Corner, OH.



Carroll CP, Vuong SM, Tackla RD, Jeong WJ, Serrone JC, Ringer AJ. (2017). Does Daily Aspirin Protect Against Aneurysmal Growth? Podium presentation at the Ohio State Neurosurgical Society Annual Meeting. Columbus, OH.

Carroll CP, Vuong SM, Fessler RD, Jeong WJ, Tobler WD. (2017). Development of a Free-Standing Ambulatory Neurosurgery Center. Podium presentation at the Ohio State Neurosurgical Society Annual Meeting. Columbus, OH.

Vuong SM, Goto, J, Shula CS, Abdelhamed ZI, Stottmann, R, Campbell K, Mangano FT. (2017). Genetic Characterization of a Novel Mouse Mutant of Pediatric Hydrocephalus. Poster presentation at the Ohio State Neurosurgical Society Annual Meeting. Top Poster Award Winner. Columbus, OH.

Vuong SM. (2017). Winter Clinics – Stump the Chump: Sacroiliac Joint Fusion Case Study. The Winter Clinics for Cranial and Spinal Surgery. Snowmass, CO.

Carroll CP, Vuong SM, Fessler RD, Jeong WJ, Tobler WD. (2017). Ambulatory Spine Surgery: Development of a Free-Standing Ambulatory Neurosurgery Center. Electronic poster presentation at 2017 AANS Annual Scientific Meeting. Los Angeles, CA.

Tackla RD, Carroll CP, Jeong WJ, Vuong SM, Serrone JC, Ringer AJ. (2017). Does Daily Aspirin Protect Against Aneurysmal Growth? Digital poster presentation at AANS/CNS Cerebrovascular Section 2017 Annual Meeting. Houston, TX.

Vuong SM. (2017). Neurosurgery Department Grand Rounds: CSF Flow Dynamics. Do we really understand CSF flow? Department of Neurosurgery & The Mayfield Clinic. Cincinnati, OH.

Vuong SM, Goto, J, Shula CS, Abdelhamed ZI, Stottmann, R, Campbell K, Mangano FT. (2016). Genetic Characterization of the progressive hydrocephaly (prh) Mouse Mutant. Poster presentation at the 45<sup>th</sup> Annual Meeting of the AANS/CNS Section on Pediatric Neurological Surgery. Orlando, FL.

Serrone JC, Tackla RD, Gozal YM, Hanseman DJ, Gogela SL, Vuong SM, Kosty J, Krueger BM, Grossman AW, Ringer AJ. (2015). Aneurysm growth and de novo aneurysm formation during an aneurysm surveillance protocol. Poster presentation at the Congress of Neurological Surgeons. New Orleans, LA.

Vuong SM. (2015). Monday Pediatric Neurosurgery Conference: Pediatric Joint Section Hydrocephalus Guidelines. Cincinnati Children's Hospital & Medical Center Department of Neurosurgery. Cincinnati, OH

Gozal YM, York JD, Vuong SM, Patel SK, Look A, Gogela SL, Andaluz NO. (2014). Predictors of radiographic progression of intracranial hemorrhage in mild traumatic brain injury. Poster presentation at the Neurocritical Care Society. Seattle, WA.

Vuong SM. (2014). Neurosurgery Department Grand Rounds: Endovascular Therapy for Acute Stroke. Is tPA the only viable treatment option? Department of Neurosurgery & The Mayfield Clinic. Cincinnati, OH.

Vuong SM. (2013). Trauma Conference Presentation: C-Spine Clearance. University of Cincinnati, Department of Surgery. Cincinnati, OH.

Vuong SM. (2011). Grand Rounds Presentation: Psychosurgery on Addiction: The past, present, and future of neurosurgery for mental disorders. University of Wisconsin, Department of Neurosurgery. Madison, WI.

Vuong SM. (2011). Avera Sacred Heart Hospice. Poster presentation at The Sanford School of Medicine Cultural Colloquium, Yankton Campus. Yankton, SD.

Cowles, D, Vuong, SM. (2011). Dermatologic Emergency: Pediatric Edition. Peer reviewed presentation on Stevens-Johnson Syndrome. Sanford School of Medicine, Yankton Campus. Yankton, SD.

Vuong, SM, Scholl, JS and Forster, GL. (2008). Amphetamine Treatment Increases Neural Response to Stress Hormone. Poster presentation at The University of South Dakota IdeaFest Research Forum. Vermillion, SD.



Vuong, SM, Scholl, JS and Forster, GL. (2007). Changes in a neural stress system as a result of amphetamine treatment. Poster presentation at The University of South Dakota IdeaFest Undergraduate Research Forum. Vermillion, SD.

## Courses

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Cranial and Spinal Stryker Drill Hands-On Workshop. April 2018. Goodyear Skull Base Lab at the University of Cincinnati – Cincinnati, OH

University of Cincinnati Microvascular Skills Course. March 2018. Goodyear Skull Base Anatomy Laboratory at the University of Cincinnati – Cincinnati, OH

University of Cincinnati Microvascular Skills Course. August 2017. Lab for Surgical Innovation at the University of Cincinnati – Cincinnati, OH

Inaugural Allegheny Health Network Dr. Walter Grand Brain Endoscopy Course. July 2017. Allegheny General Hospital, Magovern Conference Center and Center for Surgical Arts - Pittsburgh, PA

University of Cincinnati Microvascular Skills Course. May 2017. Lab for Surgical Innovation at the University of Cincinnati – Cincinnati, OH

Zimmer Spine Resident & Fellows Program. April 2017. Mayfield Center for Surgical Innovation - Cincinnati, OH

AANS/NREF Fundamentals in Spinal Surgery Course for Residents. November 2016. MITIE, Methodist Institute for Technology, Innovation and Education – Houston, TX

Keck School of Medicine of USC – Approaches to the Skull Base: Senior Neurosurgical Residents Course. November 2016. DePuy Synthes Laboratory – Palm Beach Gardens, FL.

University of Cincinnati Microvascular Skills Course. October 2016. Goodyear Skull Base Anatomy Laboratory at the University of Cincinnati – Cincinnati, OH

DePuy Synthes & Ethicon Spine Lab. August 2016. Mayfield Center for Surgical Innovation – Cincinnati, OH

Zimmer Spine Resident & Fellows Program. July 2016. Mayfield Center for Surgical Innovation - Cincinnati, OH

Cranial Midas Rex Hands-On Workshop. June 2016. Goodyear Skull Base Lab at the University of Cincinnati – Cincinnati, OH

Advanced Midas Rex Hands-On Workshop. March 2016. Goodyear Skull Base Lab at the University of Cincinnati – Cincinnati, OH

The Chicago Review Course in Neurological Surgery. January 2016. The University of Chicago - Chicago, IL

Zimmer Spine Resident & Fellows Program. November 2015. Christ Hospital Spine Surgery Center - Cincinnati, OH

9<sup>th</sup> Annual Ozarks Neurosurgery Education Clinic. October 2015. ONE Clinic and Cox Health – Branson, MO

Medtronic Midas Rex Drill Course. October 2015. Goodyear Skull Base Lab at the University of Cincinnati – Cincinnati, OH

University of Cincinnati Microvascular Skills Course. September 2015. Lab for Surgical Innovation at the University of Cincinnati – Cincinnati, OH

Zimmer Spine Resident & Fellows Program. July 2014. Christ Hospital Spine Surgery Center - Cincinnati, OH



University of Cincinnati Microvascular Skills Course. April 2014. Lab for Surgical Innovation at the University of Cincinnati – Cincinnati, OH

Medtronic Midas Rex Drill Course. August 2013. Goodyear Skull Base Lab at the University of Cincinnati – Cincinnati, OH

Zimmer Spine Resident & Fellows Program. June 2013. Christ Hospital Spine Surgery Center - Cincinnati, OH

Society of Neurological Surgeons (SNS) PGY-1 Boot Camp: Fundamental Skills Course. July 2012. Philadelphia, PA\

## Patents

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Vuong, SM. (2018) "Apparatus and Method to Facilitate Controlling of an Ocular Shield including a Controllable Light Source." U.S. Provisional Patent Appl. 62728817. September 9<sup>th</sup> 2018. Full Patent Appl. Filed February 6<sup>th</sup> 2019.

## Awards, Honors, & Grants

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### Frank H. Mayfield Society

**Inducted April 14th 2018**

Mayfield Brain & Spine

Inducted into the Frank H. Mayfield Society as graduate of the University of Cincinnati Neurosurgery Residency

### Hydrocephalus Association's Young Investigator 2018 Travel Award

**Awarded January 2018**

Cincinnati Children's Hospital & Medical Center, University of Cincinnati Medical Center, & the Mayfield Clinic

Poster Titled: CRISPR/Cas9-Based Development of progressive hydrocephaly (prh) Rat Model of  
Awarded funding to attend HACONNECT<sup>18</sup>

### 2017 Hydrocephalus Association Award

**Awarded December 2017**

Resident award for the best presentation on the topic of Hydrocephalus presented at the 2017 AANS/CNS Joint Pediatric Section Annual Meeting in Houston, TX. Presented award at AANS 2018 in New Orleans, LA.

Presentation Titled: CRISPR/Cas9-Based Development of progressive hydrocephaly (prh) Rat Model of Hydrocephalus

### Top Poster Award Winner

**Awarded April 2017**

Poster presentation at the Ohio State Neurosurgical Society Annual Meeting. Columbus, OH.

Poster Titled: Genetic Characterization of a Novel Mouse Mutant of Pediatric Hydrocephalus



### **Mayfield Education & Research Foundation (MERF) Grant**

**Awarded January 2016**

Cincinnati Children's Hospital & Medical Center, University of Cincinnati Medical Center, & the Mayfield Clinic

Research Titled: Identification of Molecular Therapeutic Targets in Choroid Plexus using a Novel Mouse Model of Communicating Hydrocephalus.

Awarded \$48,000

### **Professional Memberships**

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American College of Surgeons (ACS) – Associate Fellow

American Association of Neurological Surgeons (AANS) – Provisional Fellow

Congress of Neurological Surgeons (CNS) – Transitional

### **Research & Teaching Experience**

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#### **Resident Researcher**

**July 2016 – June 2017**

Cincinnati Children's Hospital & Medical Center. Cincinnati, OH

Neuroscience research on congenital hydrocephalus in a mouse model under the supervision of June Goto Nakamura Ph.D. and Francesco Mangano, DO.

#### **Research Technician**

**January 2006 – July 2010**

University of South Dakota. Vermillion, SD

Neuroscience research conducted under the supervision of Gina L. Forster Ph.D.

#### **Emergency Medical Technician - Instructor**

**July 2005 – July 2010**

Vermillion/Clay County EMS. Vermillion, SD

NREMT-Basic certification received May 2005, and NREMT-Intermediate 85 received June 2007

Taught EMT-Basic students, human anatomy & physiology, vital signs, SAMPLE history taking, pharmacology, respiratory system, cardiac system, and the recognition and treatment of bleeding and shock as an EMT instructor.