



Spyros Karadimas, MD, PhD

Assistant Professor of Neurosurgery

CLINICAL OFFICE (PRIMARY)

- **Stanford Neuroscience Health Center**

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ACADEMIC CONTACT INFORMATION

- **Administrative Assistant**

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Bio

BIO

Dr. Spyridon Karadimas is a board-certified, fellowship-trained cerebrovascular neurosurgeon and physician-scientist with Stanford Health Care. He is also an assistant professor in the Department of Neurosurgery at Stanford University School of Medicine.

Dr. Karadimas offers advanced, personalized treatment for complex vascular disorders of the brain, neck, and spine in both adults and children. His expertise spans brain aneurysms, arteriovenous malformations, cavernous malformations, arteriovenous fistulas, Moyamoya disease, stroke, and carotid artery disease. Dr. Karadimas is a rare combination of surgeon, scientist, and innovator dedicated to advancing patient care and shaping the future of cerebrovascular neurosurgery.

Dr. Karadimas directs a basic and translational research program focused on the neural circuits of motor control and stroke recovery. His laboratory integrates systems neuroscience, in vivo imaging, electrophysiology, and brain-computer interface development to uncover the principles of neuroplasticity, or how the brain adapts to change. This knowledge allows him to create new ways to help people move again after a brain injury.

Dr. Karadimas has published his research as first author in peer-reviewed journals such as Nature, Nature Neuroscience and Science Translational Medicine. His work has received editorial highlight at Nature Reviews Neuroscience. He has presented to his peers at international, national, and regional meetings, including those of the American Academy of Neurological Surgery, American Association of Neurological Surgeons (AANS), European Association of Neurosurgical Societies, and World Federation of Skull Base Societies.

Dr. Karadimas is a fellow of the Royal College of Surgeons of Canada and American Association of Neurological Surgeons as well as member of the Congress of Neurological Surgeons, and the North American Skull Base Society.

CLINICAL FOCUS

- Neurosurgery

- Arteriovenous Malformation
- Brain Aneurysm (Cerebral Aneurysm)
- Moyamoya
- Carotid Artery Disease
- Cavernous Malformation
- Dural Arteriovenous Fistulas
- Stroke
- Cerebrovascular Surgery
- Endovascular Surgery
- Minimally Invasive Cranial Surgery
- Skull Base Surgery

ACADEMIC APPOINTMENTS

- Assistant Professor - University Medical Line, Neurosurgery
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Best Paper Award in Basic Research Science, SpineFEST, University of Toronto
- Podium Presentation Selection, Society of Neuroscience
- Podium Presentation Selection, Congress of Neurological Surgeons
- Podium Presentation Selection, American Association of Neurological Surgeons
- Best Paper Award in Basic Research Science, Cervical Spine Research Society, 2013 (2013)
- Best Paper Award in Basic Research Science, Cervical Spine Research Society (2012)
- 2nd Place, Best Poster Award, International Conference of Animal Models of Human Diseases, 2011 (2011)
- Best Poster Award, Toronto Western Research Institute (2011)
- Best Paper Award in Basic Research Science, AOSpine North America Fellows Forum (2012)
- Best Paper Award in Basic Research Science, Cervical Spine Research Society (2014)
- Annual Best Resident/Fellow Presentation, North America Spine Society (2015)
- Gallie Bateman and McMurrich Resident Research Award, Gallie Day, Department of Surgery, University of Toronto (2020)
- Apple Award, American Spinal Injury Association (2015)
- Keep breathing. Editorial highlight, Nature Reviews Neuroscience (2018)
- Distinguished Scholarship for PhD Studies, Alexander S. Onassis Foundation (2013-2017)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Fellow, American Association of Neurological Surgeons (2025 - present)
- Fellow, Royal College of Physicians and Surgeons of Canada (2023 - present)
- Member, Congress of Neurological Surgeons (2017 - present)
- Member, North American Skull Base Society (2025 - present)

PROFESSIONAL EDUCATION

- Board Certification: Neurosurgery, Royal College of Physicians and Surgeons of Canada (2023)

- Fellowship, Thomas Jefferson University , Endovascular Neurosurgery (2025)
- Fellowship, University of Miami/Jackson Memorial Hospital & UTHealth Houston , Cerebrovascular and Skull Base Surgery (2024)
- Fellowship, University of Toronto, Toronto Western Hospital , Cerebrovascular Surgery (2022)
- Residency: University of Toronto (2023) Canada
- PhD, University of Toronto , Neuroscience (2018)
- PhD, University of Patras , Medicine (2013)
- Medical Education: University of Athens Medical School (2008) Greece

LINKS

- Get a second opinion: <https://stanfordhealthcare.org/second-opinion/overview.html>

Teaching

STANFORD ADVISEES

Med Scholar Project Advisor

Yasmeen Quadri

Postdoctoral Faculty Sponsor

Kumar Pankaj Gupta

Publications

PUBLICATIONS

- **Sensory cortical control of movement.** *Nature neuroscience*
Karadimas, S. K., Satkunendrarajah, K., Laliberte, A. M., Ringuette, D., Weisspapier, I., Li, L., Gosgnach, S., Fehlings, M. G.
2020; 23 (1): 75-84
- **Cervical excitatory neurons sustain breathing after spinal cord injury.** *Nature*
Satkunendrarajah, K., Karadimas, S. K., Laliberte, A. M., Montandon, G., Fehlings, M. G.
2018; 562 (7727): 419-422
- **Riluzole blocks perioperative ischemia-reperfusion injury and enhances postdecompression outcomes in cervical spondylotic myelopathy.** *Science translational medicine*
Karadimas, S. K., Laliberte, A. M., Tetreault, L., Chung, Y. S., Arnold, P., Foltz, W. D., Fehlings, M. G.
2015; 7 (316): 316ra194
- **The Impact of Postprocedural Anticoagulant Use in Patients Undergoing Woven EndoBridge: A Multicenter Propensity Score-Matched Study.** *Translational stroke research*
Musmar, B., Salim, H. A., Roy, J. M., Adeeb, N., Fuleihan, A. A., Atallah, E., Sizdahkhani, S., Koduri, S., Karadimas, S., Baba, B. E., Howard, B. M., Grossberg, J. A., Scott, et al
2025; 16 (5): 1486-1495
- **Vagus nerve stimulation paired with rehabilitation for post-stroke recovery: A single center experience of patient satisfaction and outcomes.** *Clinical neurology and neurosurgery*
Roy, J. M., Musmar, B., Ritz, C., Sizdahkhani, S., Karadimas, S., Papadopoulos, E., Patel, S., Wu, C., Jabbour, P., Rosenwasser, R. H., Tjournakaris, S. I., Gooch, M. R.
2025; 257: 109043
- **Does the volume of Onyx injected influence outcomes after middle meningeal artery embolization for subdural hematoma?** *Journal of clinical neuroscience : official journal of the Neurosurgical Society of Australasia*
Roy, J. M., Musmar, B., Karadimas, S., Sizdahkhani, S., Momin, A., Pontarelli, M. K., Garg, A., Papadopoulos, E., Pedapati, V., Pannu, A., Tjournakaris, S. I., Gooch, M. R., Rosenwasser, et al
2025; 142: 111651

- **Outcomes of arteriovenous malformation patients with multiple versus single feeders: A multicenter retrospective study with propensity-score matching.** *European stroke journal*
Musmar, B., Adeeb, N., Abdalrazeq, H., Roy, J. M., Tjoumakaris, S. I., Salim, H. A., Kondziolka, D., Sheehan, J., Ogilvy, C. S., Riina, H., Kandregula, S., Dmytriw, A. A., El Naamani, et al
2025; 10 (3): 946-960
- **Racial/ethnic disparities among individuals with unruptured and ruptured cerebral aneurysms: Insights from the All of Us Research Program.** *International journal of stroke : official journal of the International Stroke Society*
Roy, J. M., Musmar, B., Piper, K., Ghanem, L., Ritz, C., Karadimas, S., Koduri, S., Tjoumakaris, S. I., Gooch, M. R., Rosenwasser, R. H., Jabbour, P.
2025: 17474930251367208
- **Risk factors for in-stent stenosis after flow-diverter implantation for intracranial aneurysm: a single center analysis of 161 consecutive patients.** *Acta neurochirurgica*
Alshahrani, R., Karadimas, S., Alvi, M. A., Nicholson, P. J., Krings, T.
2025; 167 (1): 194
- **Outcomes of arteriovenous malformations with single versus multiple draining veins: A multicenter study.** *Journal of the neurological sciences*
Musmar, B., Abdalrazeq, H., Adeeb, N., Roy, J. M., Aslan, A., Tjoumakaris, S. I., Salim, H. A., Ogilvy, C. S., Baskaya, M. K., Kondziolka, D., Sheehan, J., Riina, H., Kandregula, et al
2025; 473: 123503
- **Flow Diversion in Patients With Concurrent Anticoagulation: Multicenter Experience and Systematic Review of Literature.** *Operative neurosurgery (Hagerstown, Md.)*
Roy, J. M., Musmar, B., Koduri, S., Baldari, A., Sokol, Z., Amaravadi, C., Karadimas, S., Kozak, O., Mackenzie, L., Schmidt, R. F., Ghosh, R., Tjoumakaris, S. I., Gooch, et al
2025
- **Clinical impact of gradient echo MRI versus CT in detecting hemorrhagic transformation after mechanical thrombectomy.** *Neuroradiology*
Musmar, B., M Roy, J., Abdalrazeq, H., Pedapati, V., A Fuleihan, A., Koduri, S., Sizdahkhani, S., Atallah, E., Karadimas, S., I Tjoumakaris, S., Gooch, M. R., H Rosenwasser, R., Jabbour, et al
2025; 67 (6): 1395-1403
- **Microsurgical Resection of a Left Precentral Gyrus Arteriovenous Malformation: 3-Dimensional Operative Video.** *Operative neurosurgery (Hagerstown, Md.)*
Karadimas, S. K., Morcos, J. J.
2025; 28 (4): 574
- **Comparative outcomes of endovascular vs. surgical treatment in craniocervical junction dural arteriovenous fistulas: A systematic review and meta-analysis.** *Journal of the neurological sciences*
Musmar, B., Roy, J. M., Orselik, A., Koduri, S., Karadimas, S., Sizdahkhani, S., Atallah, E., Tjoumakaris, S. I., Gooch, M. R., Zazour, H., Ghosh, R., Schmidt, R. F., Rosenwasser, et al
2025; 470: 123402
- **Occipital Interhemispheric Transtentorial Approach for Microsurgical Treatment of Posterior Midbrain Arteriovenous Malformation: 2-Dimensional Operative Video.** *Operative neurosurgery (Hagerstown, Md.)*
Karadimas, S. K., Silva, M. A., Starke, R. M.
2025; 28 (3): 445-446
- **Treatment of Recurrent, Twice Coiled, Previously Ruptured Anterior Inferior Cerebellar Artery-Posterior Inferior Cerebellar Artery Aneurysm With Excision and End-to-End Anastomosis: 2-Dimensional Operative Video.** *Operative neurosurgery (Hagerstown, Md.)*
Karadimas, S. K., Wu, E. M., Elarjani, T., Morcos, J. J.
2025; 28 (2): 277
- **Comparative analysis of safety and efficacy of flow diversion with and without surface modification technology, FRED-X, FRED, PED shield and PED in 386 patients: A single center experience with systematic review and network meta analysis.** *Journal of the neurological sciences*
Roy, J. M., Musmar, B., El Naamani, K., Ahmed, M. T., Kaul, A., Amaravadi, C., Sizdahkhani, S., Karadimas, S., Gooch, M. R., Jabbour, P., Rosenwasser, R., Tjoumakaris, S. I.
2025; 468: 123336

- **Retrosigmoid Transtentorial Approach with Suprameatal Drilling (Kawase from below) for Gross Total Resection of a Large Petroclival Meningioma** *Journal of Neurological Surgery Part B: Skull Base*
Karadimas, S., Chandra, A., Morcos, J. J.
2025
- **STA-MCA Bypass and Excision of a Giant Partially Thrombosed Ruptured M2 Aneurysm** *Journal of Neurological Surgery Part B: Skull Base*
Karadimas, S., Ellenbogen, Y., Alshahrani, R., Radovanovic, I.
2025
- **Lateral Supraorbital Translamina Terminalis Approach for Resection of a Chiasmatic Cavernoma** *Journal of Neurological Surgery Part B Skull Base*
Karadimas, S., Radovanovic, I.
2025
- **Endoscopic Trans-pterional Port Approach for Microsurgical Clipping of MCA Aneurysm** *Journal of Neurological Surgery Part B: Skull Base*
Karadimas, S., Radovanovic, I.
2025
- **Lateral Supraorbital Approach for Microsurgical Clipping of Recurrent Ruptured Fetal Posterior Communicating Artery Aneurysm Initially Treated With Woven Endobridge Embolization and Flow Diversion: 2-Dimensional Operative Video.** *Operative neurosurgery (Hagerstown, Md.)*
Karadimas, S. K., Silva, M. A., Starke, R. M.
2024; 27 (6): 789
- **Complications: skull base and cerebrovascular.** *Neurosurgical focus*
Jean, W. C., Charbel, F. T., Cohen-Gadol, A. A., Couldwell, W. T., Lawton, M. T., McDermott, M., Morcos, J. J., Spetzler, R. F., van Loveren, H. R.
2024; 57 (4): E2
- **Microsurgical Resection of a Left Eloquent Arteriovenous Malformation Presenting With Papilledema: 3-Dimensional Operative Video.** *Operative neurosurgery (Hagerstown, Md.)*
Karadimas, S. K., Woon, C. C., Krings, T., Sheth, S. A., Morcos, J. J.
2024; 29 (1): 153
- **Use of the neuroform atlas for stenting of intracranial atherosclerotic disease: Clinical and angiographic outcomes.** *Interventional neuroradiology : journal of peritherapeutic neuroradiology, surgical procedures and related neurosciences*
Ellenbogen, Y., Hendriks, E. J., Karadimas, S., O'Reilly, S., Itsekzon Hayosh, Z., Alshahrani, R., Agid, R., Schaafsma, J., Krings, T., Nicholson, P.
2023; 15910199231195134
- **Occipital Interhemispheric Transtentorial Approach for Microsurgical Resection of a Ruptured Vermian Arteriovenous Malformation: Three-Dimensional Operative Video.** *World neurosurgery*
Karadimas, S. K., Fierstra, J., Radovanovic, I.
2022; 168: 243
- **Minimally Invasive and Outpatient Aneurysm Surgery: New Concepts.** *Neurosurgery clinics of North America*
Karadimas, S., Shakil, H., Almeida, J. P., Tymianski, M., Radovanovic, I.
2022; 33 (4): 371-382
- **Spinal cord injury and degenerative cervical myelopathy.** *Handbook of clinical neurology*
Satkunendrarajah, K., Karadimas, S. K., Fehlings, M. G.
2022; 189: 241-257
- **Chemogenetic stimulation of proprioceptors remodels lumbar interneuron excitability and promotes motor recovery after SCI.** *Molecular therapy : the journal of the American Society of Gene Therapy*
Gao, Z., Yang, Y., Feng, Z., Li, X., Min, C., Zhu, Z., Song, H., Hu, Y., Wang, Y., He, X.
2021; 29 (8): 2483-2498
- **Mir21 modulates inflammation and sensorimotor deficits in cervical myelopathy: data from humans and animal models.** *Brain communications*
Laliberte, A. M., Karadimas, S. K., Vidal, P. M., Satkunendrarajah, K., Fehlings, M. G.
2021; 3 (1): fcaa234

- **The Impact of Riluzole on Neurobehavioral Outcomes in Preclinical Models of Traumatic and Nontraumatic Spinal Cord Injury: Results From a Systematic Review of the Literature.** *Global spine journal*
Tetreault, L. A., Zhu, M. P., Wilson, J. R., Karadimas, S. K., Fehlings, M. G.
2020; 10 (2): 216-229
- **Extended Retrosigmoid Approach for the Resection of a Pontomedullary Junction Cavernous Malformation.** *Journal of neurological surgery. Part B, Skull base*
Basma, J., Nguyen, V., Sorenson, J., Michael, L. M.
2018; 79 (Suppl 5): S418-S419
- **The Natural History of Degenerative Cervical Myelopathy and the Rate of Hospitalization Following Spinal Cord Injury: An Updated Systematic Review.** *Global spine journal*
Tetreault, L. A., Karadimas, S., Wilson, J. R., Arnold, P. M., Kurpad, S., Dettori, J. R., Fehlings, M. G.
2017; 7 (3 Suppl): 28S-34S
- **Delayed decompression exacerbates ischemia-reperfusion injury in cervical compressive myelopathy.** *JCI insight*
Vidal, P. M., Karadimas, S. K., Uldreaj, A., Laliberte, A. M., Tetreault, L., Forner, S., Wang, J., Foltz, W. D., Fehlings, M. G.
2017; 2 (11)
- **Rewiring of spinal respiratory neural network via cervical glutamatergic interneurons preserves respiratory function in progressive cervical spinal cord compression injury (CSM)**
Satkunendrarajah, K., Karadimas, S. K., Khazaei, M., Samson, P., Fehlings, M. G.
FEDERATION AMER SOC EXP BIOL.2016
- **Cervical neurons control locomotion**
Karadimas, S., Satkunendrarajah, K., Sivakumaran, S., Gosgnach, S., Fehlings, M. G.
FEDERATION AMER SOC EXP BIOL.2016
- **Riluzole promotes motor and respiratory recovery associated with enhanced neuronal survival and function following high cervical spinal hemisection.** *Experimental neurology*
Satkunendrarajah, K., Nassiri, F., Karadimas, S. K., Lip, A., Yao, G., Fehlings, M. G.
2016; 276: 59-71
- **Degenerative Cervical Myelopathy: Epidemiology, Genetics, and Pathogenesis.** *Spine*
Nouri, A., Tetreault, L., Singh, A., Karadimas, S. K., Fehlings, M. G.
2015; 40 (12): E675-93
- **Pathobiology of cervical spondylotic myelopathy.** *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society*
Karadimas, S. K., Gatzounis, G., Fehlings, M. G.
2015; 24 Suppl 2: 132-8
- **Bilateral contusion-compression model of incomplete traumatic cervical spinal cord injury.** *Journal of neurotrauma*
Forgione, N., Karadimas, S. K., Foltz, W. D., Satkunendrarajah, K., Lip, A., Fehlings, M. G.
2014; 31 (21): 1776-88
- **Delayed administration of a bio-engineered zinc-finger VEGF-A gene therapy is neuroprotective and attenuates allodynia following traumatic spinal cord injury.** *PLoS one*
Figley, S. A., Liu, Y., Karadimas, S. K., Satkunendrarajah, K., Fettes, P., Spratt, S. K., Lee, G., Ando, D., Surosky, R., Giedlin, M., Fehlings, M. G.
2014; 9 (5): e96137
- **Synergistic effects of self-assembling peptide and neural stem/progenitor cells to promote tissue repair and forelimb functional recovery in cervical spinal cord injury.** *Biomaterials*
Iwasaki, M., Wilcox, J. T., Nishimura, Y., Zweckberger, K., Suzuki, H., Wang, J., Liu, Y., Karadimas, S. K., Fehlings, M. G.
2014; 35 (9): 2617-29
- **Riluzole attenuates neuropathic pain and enhances functional recovery in a rodent model of cervical spondylotic myelopathy.** *Neurobiology of disease*
Moon, E. S., Karadimas, S. K., Yu, W. R., Austin, J. W., Fehlings, M. G.
2014; 62: 394-406

- **Pathophysiology and natural history of cervical spondylotic myelopathy.** *Spine*
Karadimas, S. K., Erwin, W. M., Ely, C. G., Dettori, J. R., Fehlings, M. G.
2013; 38 (22 Suppl 1): S21-36
- **Clinical evaluation of a neuroprotective drug in patients with cervical spondylotic myelopathy undergoing surgical treatment: design and rationale for the CSM-Protect trial.** *Spine*
Fehlings, M. G., Wilson, J. R., Karadimas, S. K., Arnold, P. M., Kopjar, B.
2013; 38 (22 Suppl 1): S68-75
- **Cervical spondylotic myelopathy: the clinical phenomenon and the current pathobiology of an increasingly prevalent and devastating disorder.** *The Neuroscientist : a review journal bringing neurobiology, neurology and psychiatry*
Kalsi-Ryan, S., Karadimas, S. K., Fehlings, M. G.
2013; 19 (4): 409-21
- **A novel experimental model of cervical spondylotic myelopathy (CSM) to facilitate translational research.** *Neurobiology of disease*
Karadimas, S. K., Moon, E. S., Yu, W. R., Satkunendrarajah, K., Kallitsis, J. K., Gatzounis, G., Fehlings, M. G.
2013; 54: 43-58
- **Immunohistochemical profile of NF- κ B/p50, NF- κ B/p65, MMP-9, MMP-2, and u-PA in experimental cervical spondylotic myelopathy.** *Spine*
Karadimas, S. K., Klironomos, G., Papachristou, D. J., Papanikolaou, S., Papadaki, E., Gatzounis, G.
2013; 38 (1): 4-10
- **The Sodium Channel/Glutamate Blocker Riluzole is Complementary to Decompression in a Preclinical Experimental Model of Cervical Spondylotic Myelopathy (CSM): Implications for Translational Clinical Application**
Karadimas, S., Moon, E., Fehlings, M. G.
LIPPINCOTT WILLIAMS & WILKINS.2012: E543
- **New experimental rabbit animal model for cervical spondylotic myelopathy.** *Spinal cord*
Klironomos, G., Karadimas, S., Mavrakis, A., Mirilas, P., Savvas, I., Papadaki, E., Papachristou, D. J., Gatzounis, G.
2011; 49 (11): 1097-102
- **The role of oligodendrocytes in the molecular pathobiology and potential molecular treatment of cervical spondylotic myelopathy.** *Current medicinal chemistry*
Karadimas, S. K., Gialeli, C. H., Klironomos, G., Tzanakakis, G. N., Panagiotopoulos, E., Karamanos, N. K., Gatzounis, G.
2010; 17 (11): 1048-58