Stanford

Corinna Darian-Smith, PhD

Professor of Comparative Medicine

CONTACT INFORMATION

- **Alternate Contact**

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Bio

ACADEMIC APPOINTMENTS

- Professor, Comparative Medicine

PROFESSIONAL EDUCATION

- PhD, University of Melbourne , Neuroscience (1991)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My research focuses on two main areas:

1) the structural organization and function of central neural pathways (e.g. of the spinal cord, brainstem, thalamus and cortex) that underlie directed manual behavior, and

2) the capacity of these central neural pathways (circuits) to compensate/adapt following localized injury. Our laboratory uses multiple neuroanatomical, electrophysiological and behavioural approaches to look at the sensorimotor systems of nonhuman primates, and rodents, to examine the neural basis for functional recovery' observed following the selective disruption of pathways mediating fine finger control.

Teaching

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Neurosciences (PhD Program)

Publications

PUBLICATIONS

- **Chronic Adaptations in the Dorsal Horn Following a Cervical Spinal Cord Injury in Primates.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*

  Fisher, K. M., Garner, J. P., Darian-Smith, C.

  2024; 44 (3)

- **Small sensory spinal lesions that affect hand function in monkeys greatly alter primary afferent and motor neuron connections in the cord.** *The Journal of comparative neurology*

  Fisher, K. M., Garner, J. P., Darian-Smith, C.

  2022

- **Semi-quantitative Assessment of Alzheimer's-like Pathology in Two Aged Polar Bears (Ursus maritimus).** *Comparative medicine*
  Lucot, K. L., Bukhari, S. A., Webber, E. D., Bonham, T. A., Darian-Smith, C., Montine, T. J., Green, S. L.
  2022
- **Behavioral recovery after a spinal deafferentation injury in monkeys does not correlate with extent of corticospinal sprouting.** *Behavioural brain research*
  Crowley, M., Lilak, A., Garner, J. P., Darian-Smith, C.
  2021: 113533
- **Reorganization of the Primate Dorsal Horn in Response to a Deafferentation Lesion Affecting Hand Function.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
  Fisher, K. M., Garner, J., Darian-Smith, C.
  2020
- **Somatosensory corticospinal tract axons sprout within the cervical cord following a dorsal root/dorsal column spinal injury in the rat.** *The Journal of comparative neurology*
  McCann, M. M., Fisher, K. M., Ahloy-Dallaire, J., Darian-Smith, C.
  2019
- **Spinal cord injury transiently alters Meissner's corpuscle density in the digit pads of macaque monkeys** *JOURNAL OF COMPARATIVE NEUROLOGY*
  Crowley, M., Lilak, A., Ahloy-Dallaire, J., Darian-Smith, C.
  2019; 527 (11): 1901–12
- **Extensive Somatosensory and Motor Corticospinal Sprouting Occurs Following a Central Dorsal Column Lesion in Monkeys.** *The Journal of comparative neurology*
  Fisher, K. M., Lilak, A., Garner, J., Darian-Smith, C.
  2018
- **Corticospinal Sprouting Differs According to Spinal Injury Location and Cortical Origin in Macaque Monkeys** *JOURNAL OF NEUROSCIENCE*
  Darian-Smith, C., Lilak, A., Garner, J., Irvine, K.
  2014; 34 (37): 12267-12279
- **Corticospinal sprouting occurs selectively following dorsal rhizotomy in the macaque monkey.** *journal of comparative neurology*
  Darian-Smith, C., Lilak, A., Alarcón, C.
  2013; 521 (10): 2359-2372
- **Adult Neurogenesis Occurs in Primate Sensorimotor Cortex following Cervical Dorsal Rhizotomy** *JOURNAL OF NEUROSCIENCE*
  Vessal, M., Darian-Smith, C.
  2010; 30 (25): 8613-8623
- **Changes in Synaptic Populations in the Spinal Dorsal Horn Following a Dorsal Rhizotomy in the Monkey** *JOURNAL OF COMPARATIVE NEUROLOGY*
  Darian-Smith, C., Hopkins, S., Ralston, H. J.
  2010; 518 (1): 103-117
- **Synaptic Plasticity, Neurogenesis, and Functional Recovery after Spinal Cord Injury** *NEUROSCIENTIST*
  Darian-Smith, C.
  2009; 15 (2): 149-165
- **Adult neurogenesis in primate and rodent spinal cord: comparing a cervical dorsal rhizotomy with a dorsal column transection** *EUROPEAN JOURNAL OF NEUROSCIENCE*
  Vessal, M., Aycock, A., Garton, M. T., Ciferri, M., Darian-Smith, C.
  2007; 26 (10): 2777-2794
- **Synaptic protein dynamics in hibernation** *JOURNAL OF NEUROSCIENCE*
  von der Ohe, C. G., Garner, C. C., Darian-Smith, C., Heller, H. C.
  2007; 27 (1): 84-92
- **Monkey models of recovery of voluntary hand movement after spinal cord and dorsal root injury** *ILAR JOURNAL*

Darian-Smith, C.
2007; 48 (4): 396-410

- **Ubiquitous and temperature-dependent neural plasticity in hibernators** *JOURNAL OF NEUROSCIENCE*
  von der Ohe, C. G., Darian-Smith, C., Garner, C. C., Heller, H. C.
  2006; 26 (41): 10590-10598
- **Cuneate nucleus reorganization following cervical dorsal rhizotomy in the macaque monkey: Its role in the recovery of manual dexterity** *JOURNAL OF COMPARATIVE NEUROLOGY*
  Darian-Smith, C., Ciferri, M.
  2006; 498 (4): 552-565
- **Loss and recovery of voluntary hand movements in the macaque following a cervical dorsal rhizotomy** *JOURNAL OF COMPARATIVE NEUROLOGY*
  Darian-Smith, C., Ciferri, M. M.
  2005; 491 (1): 27-45
- **Primary afferent terminal sprouting after a cervical dorsal rootlet section in the macaque monkey** *JOURNAL OF COMPARATIVE NEUROLOGY*
  Darian-Smith, C.
  2004; 470 (2): 134-150
- **Geometry of rubrospinal, rubroolivary, and local circuit neurons in the macaque red nucleus** *JOURNAL OF COMPARATIVE NEUROLOGY*
  Burman, K., Darian-Smith, C., Darian-Smith, I.
  2000; 423 (2): 197-219
- **Macaque red nucleus: Origins of spinal and olivary projections and terminations of cortical inputs** *JOURNAL OF COMPARATIVE NEUROLOGY*
  Burman, K., Darian-Smith, C., Darian-Smith, I.
  2000; 423 (2): 179-196
- **Functional changes at periphery and cortex following dorsal root lesions in adult monkeys** *NATURE NEUROSCIENCE*
  Darian-Smith, C., Brown, S.
  2000; 3 (5): 476-481
- **Geometry of Rubrospinal, Rubroolivary, and Local Circuit Neurons in the Macaque Red Nucelus** *J. Comp. Neurol*
  Burman K, C. Darian-Smith, I.. Darian-Smith
  2000; 423: 197-219
- **Parallel pathways mediating manual dexterity in the macaque** *Symposium on Neural Basis of Hand Dexterity*
  Darian-Smith, I., Burman, K., Darian-Smith, C.
  SPRINGER.1999: 101–8
- **Comparing thalamocortical and corticothalamic microstructure and spatial reciprocity in the macaque ventral posterolateral nucleus (VPLc) and medial pulvinar** *JOURNAL OF COMPARATIVE NEUROLOGY*
  Darian-Smith, C., Tan, A., Edwards, S.
  1999; 410 (2): 211-234
- **Manual dexterity: How does the cerebral cortex contribute?** *Australian-Physiological-and-Pharmacological-Society Meeting*
  DARIANSMITH, I., Galea, M. P., DARIANSMITH, C.
  BLACKWELL PUBLISHING.1996: 948–56
- **The anatomy of manual dexterity. The new connectivity of the primate sensorimotor thalamus and cerebral cortex.** *Advances in anatomy, embryology, and cell biology*
  Darian-Smith, I., Galea, M. P., Darian-Smith, C., Sugitani, M., Tan, A., Burman, K.
  1996; 133: 1-140
- **TOPOGRAPHIC REORGANIZATION IN THE STRIATE CORTEX OF THE ADULT CAT AND MONKEY IS CORTICALLY MEDIATED** *JOURNAL OF NEUROSCIENCE*
  DARIANSMITH, C., Gilbert, C. D.
  1995; 15 (3): 1631-1647

- **AXONAL SPROUTING ACCOMPANIES FUNCTIONAL REORGANIZATION IN ADULT CAT STRIATE CORTEX** *NATURE*
  DARIANSMITH, C., Gilbert, C. D.
  1994; 368 (6473): 737-740
- **THALAMIC PROJECTIONS TO AREA-3A, AREA-3B, AND AREA-4 IN THE SENSORIMOTOR CORTEX OF THE MATURE AND INFANT MACAQUE MONKEY** *JOURNAL OF COMPARATIVE NEUROLOGY*
  DARIANSMITH, C., DARIANSMITH, I.
  1993; 335 (2): 173-199
- **IPSILATERAL CORTICAL PROJECTIONS TO AREA-3A, AREA-3B, AND AREA-4 IN THE MACAQUE MONKEY** *JOURNAL OF COMPARATIVE NEUROLOGY*
  DARIANSMITH, C., DARIANSMITH, I., Burman, K., Ratcliffe, N.
  1993; 335 (2): 200-213
- **THALAMIC PROJECTIONS TO SENSORIMOTOR CORTEX IN THE NEWBORN MACAQUE** *JOURNAL OF COMPARATIVE NEUROLOGY*
  DARIANSMITH, C., DARIANSMITH, I., Cheema, S. S.
  1990; 299 (1): 47-63
- **THALAMIC PROJECTIONS TO SENSORIMOTOR CORTEX IN THE MACAQUE MONKEY - USE OF MULTIPLE RETROGRADE FLUORESCENT TRACERS** *JOURNAL OF COMPARATIVE NEUROLOGY*
  DARIANSMITH, C., DARIANSMITH, I., Cheema, S. S.
  1990; 299 (1): 17-46
- **THE ENVIRONMENT FOR DEVELOPMENT OF THE EMBRYONIC LOGGERHEAD TURTLE (CARETTA-CARETTA) IN QUEENSLAND** *COPEIA*
  Maloney, J. E., DARIANSMITH, C., Takahashi, Y., Limpus, C. J.
  1990: 378-387
- **AN EVOLUTIONARY LINK FOR DEVELOPING MAMMALIAN LUNGS** *JOURNAL OF DEVELOPMENTAL PHYSIOLOGY*
  Maloney, J. E., DARIANSMITH, C., Russell, B., Varghese, M., Cooper, J., Limpus, C. J.
  1989; 12 (3): 153-155