

# Muhammad Aadil Spocter

## Curriculum Vitae

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Department of Anatomy  
Des Moines University  
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[The Evolving Brain Laboratory \(EBL\)](#)  
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### CURRENT TITLES AND AFFILIATIONS

2022 - Present Full Professor, Department of Anatomy, Des Moines University  
2015 - Present Director of the Anatomy Graduate Program, Des Moines University  
2016 - Present Affiliate Assistant Professor, Department of Biomedical Sciences, Iowa State University [link](#)  
2010 - Present Senior Honorary Researcher, School of Anatomical Sciences, University of Witwatersrand [link](#)

### EDUCATION AND ACADEMIC APPOINTMENTS

#### **2022 – Present Full Professor of Anatomy (tenured)**

Department of Anatomy, Des Moines University

#### **2017 – 2022 Associate Professor of Anatomy (tenured)**

Department of Anatomy, Des Moines University

#### **2011 – 2017 Assistant Professor of Anatomy (tenure track)**

Department of Anatomy, Des Moines University

#### **2008 – 2011 Postdoctoral Fellow and Research Associate**

Laboratory for Evolutionary Neuroanatomy, Center for the Advanced Study of Hominin Paleobiology,  
Department of Anthropology, The George Washington University.

#### **2007 – 2008 Lecturer and Project Scientist**

Department of Anthropology, Integrative Anthropological Sciences Division, The University of California,  
Santa Barbara.

#### **2004 – 2007 Ph.D. Human Biology**

School of Anatomical Sciences, University of the Witwatersrand, South Africa

Dissertation: *The Panglossian Paradigm Revisited: The role of non-adaptive mechanisms in hominid brain and body size evolution.* [link](#) Committee: Advisor: Dr. Paul Manger; Internal Examiner: Dr. Ruliang Pan, External Examiners: Dr. Chet Sherwood, Dr. Patrick Hof

#### **2002 – 2004 MSc. Physical Anthropology**

School of Anatomical Sciences, University of the Witwatersrand, South Africa

Thesis: *Scaling of foramen magnum area and other cranial variables with body size: Understanding hominid body and brain evolution.* [Link](#) Advisor: Dr. Paul Manger, Internal Examiner: Dr. Kevin Kuykendall, External Examiner: Dr. Alan Morris.

#### **2001-2002 BSc. Hon. Human Biology**

School of Anatomical Sciences, University of the Witwatersrand, South Africa

Thesis: *The determination of population affinity in South African crania: A comparison of univariate and multivariate techniques.* Advisor: Dr. Kevin Kuykendall, External Examiner: Dr. Alan Morris.

#### **1998-2001 BSc. Human Biology & Medical Cell Biology**

University of the Witwatersrand, South Africa. Undergraduate Capstone Research Projects entitled: *The isolation and in vitro culture of tooth germs.* Advisor: Dr. Beverly Kramer; *A radiographic validation of the techniques employed to assess dental developmental status.* Advisor. Kevin Kuykendall.

**PUBLICATIONS**, Total 68 (50 research articles, 11 book chapters, 4 newsletters; 2 Cover images; 1 video); \*denotes DMU student.

Citation Metrics:

[From Google](#) ; [From Thomson](#) ; [From Scopus](#); [ORCID iD](#)

## RESEARCH ARTICLES

68. Malungo, I.B., Ngwenya, A., Bertelsen, M.F., **Spocter, M.A.**, Thannickal T.C., Siegel, J.M., & Manger, P.R (2025). The complexly parcellated, yet quantitatively paradoxical, orexinergic/hypocretinergic system of humans. *Journal of Comparative Neurology*. [Link](#)
67. Hopkins, W.D., **Spocter, M.A.**, Mulholland, M.M., & Sherwood, C.C. (2025). Gray matter volume and asymmetry in Broca's and Wernicke's area homologs in chimpanzees (*Pan troglodytes*): Using a probabilistic region of interest approach. *NeuroImage*. [Link](#)
65. Baer, E\*., Nguyen, P.D\*., Lilly, S\*., Song, J\*., Yee, M\*., Matz, O\*., Sahasrabudhe, R\*., Hall, D.R\*., La, S\*., Merritt, B.J\*., Mahesh, P\*., Eliacin, C\*., Bitterman, K., Oddes, D., Bertelsen, M.F., Tang, C.Y., Cook, P.F., Mars, R.B., Hof, P.R., Dunn, R., Manger, P.R., Sherwood, C.C., & **Spocter, M.A.** (2025). Predictive methods and probabilistic mapping of subcortical brain components in fossil Carnivora. *Journal of Comparative Neurology*. [Link](#)
64. Boch, M., Karadachka, K., Kee Loh, K., Benn, R.A., Roumazeilles, L., Bertelsen, M.F., Manger, P.R., Wriggelsworth, E., Spiro, S., **Spocter, M.A.**, Johnson, P., Souza, K., Patzke, N., Lamm, C., Sallet, J., Khrapitchev, A.A., Tandler, B.C., & Mars, R.B. (2024). Comparative neuroimaging of the Carnivoran brain: Cortical sulci. *eLife*. [link](#)
63. Foster, M\*., Dwibhashyam, S\*., Patel, D\*., Gupta, K\*., Matz, O.C\*., Billings, B.K., Bitterman, K., Bertelson, M., Tang, C.Y., Mars, R.B., Raghanti, M.R., Hof, P.R., Sherwood, C.C., Manger, P.R., & **Spocter, M.A.** (2024). Comparative anatomy of the caudate nucleus in the canids and felids: Associations with brain size, curvature, cross-sectional properties and behavioral ecology. *Journal of Comparative Neurology*. [link](#)
62. Mazenganya, P., **Spocter, M.A.**, & Manger, P.R (2024). Nuclear parcellation and numbers of orexinergic neurons in five species of larger brained birds. *Journal of Comparative Neurology*. [link](#)
61. Nelson, J\*., Woeste, E.M\*., Oba, K\*., Bitterman, K., Billings, B.K., Jacobs, B., Sherwood, C.C., Manger, P.R., & **Spocter, M.A.** (2024). Neuropil variation in the prefrontal, motor and visual cortex of six felids. *Brain, Behavior and Evolution*. [link](#)
60. Sacco, J., Starr, E., Weaver, A., Dietz, R., & **Spocter, M.A.** (2023). Resequencing of the TMF-1 (TATA Element Modulatory Factor) regulated protein (TRNP1) gene in domestic and wild canids. [link](#)
59. Oddes, D., Ngwenya, A., Malungo, I. B., Burkevica, A., Hard, T., Bertelsen, M. F., **Spocter, M.A.**, Scantlebury, DM., & Manger, P.R. (2023). Orexinergic neurons in the hypothalami of an Asiatic lion, an African lion and a Southeast African cheetah. *Journal of Comparative Neurology*. [link](#)
58. Matz, O.C\*., & **Spocter, M.A.** (2022). The effect of Huntington's Disease on the Basal Nuclei: A Review. *Cureus*, [link](#)
57. Dayal, M.R., Billings, B. K., Brits, D., Abdallah, A\*., **Spocter, M.A.**, & Bidmos, M.A. (2022). Sex estimation from dimensions of the base of the skull in black South Africans. *Anthropologischer Anzeiger*, [link](#)
56. Swiegers, J., Bhagwandin, A., Maseko, B. C., Sherwood, C.C., Hard, T., Bertelsen, M. F., **Spocter, M.A.**, Molnar, Z., & Manger, P.R. (2021). The distribution, number and certain neurochemical identities of infracortical white matter neurons in the brains of a southern lesser galago, a black-capped squirrel monkey and a crested macaque. *Journal of Comparative Neurology*, [link](#)
55. Manger, P.R., Patzke, N., **Spocter, M.A.**, Bhagwandin, A., Karlson, K.AE., Bertelsen, M.F., Alagaili, A.N., Bennett, N.C., Mohammed, O.B., Herculano-Houzel, S., Hof, P.R., Fuxe, K (2021) Amplification of potential thermogenic mechanisms in cetacean brains. *Scientific Reports 11*, 5486 [link](#)
54. **Spocter, M.A.**, Sherwood, C.C., Schapiro, S.J., & Hopkins, W.D. (2020). Reproducibility of Leftward Planum Temporale Asymmetries in Two Genetically Isolated Populations of Chimpanzees (*Pan troglodytes*). *Proceedings of the Royal Society of London, B*. 287(1934):000-000 [link](#)

53. Chengetania, S., Bhagwandin, A., Bertelson, M, F., Hard, T., Hof, P.R., **Spocter, M.A.**, & Manger, P.R (2020). The brain of the African wild dog. II. The visual system. *Journal of Comparative Neurology*, 528(18):3262-3284. [link](#)
52. Grewal, J.S\*, Gloe, T\*, Hegedus, J\*, Bitterman, K., Billings, B., Chengetanai, S., Bentil, S., Ng, J., Wang, V., Tang, C.C., Geletta, S., Wicinski, B., Bertelson, M., Tendler, B.C., Mars, R., Aquirre, G.K., Rusbridge, C., Hof, P.R., Sherwood, C.C., Manger, P.R., & **Spocter, M.A.** (2020). Brain gyrification in wild and domestic canids: Has domestication changed the gyrification index in domestic dogs? *Journal of Comparative Neurology*, 528(18):3209-3228. [link](#)
51. Chengetania, S., Bhagwandin, A., Bertelson, M, F., Hard, T., Hof, P.R., **Spocter, M.A.**, & Manger, P.R (2020) The brain of the African wild dog. II. The auditory system. *Journal of Comparative Neurology*, 528(18):3229-3244. [link](#)
50. Chengetania, S., Bhagwandin, A., Bertelson, M, F., Hard, T., Hof, P.R., **Spocter, M.A.**, & Manger, P.R (2020). The brain of the African wild dog. II. The olfactory system. *Journal of Comparative Neurology*, 528(18):3285-3304. [link](#)
49. Chengetania, S., Tenley, J\*, Bertelson, M, F., Hard, T., Bhagwandin, A., Haagensen, M., Tang, C., Wicinski, B., Hof, P.R., Manger, P.R., & **Spocter, M.A** (2020). The brain of the African wild dog. I. Anatomy, architecture and volumetrics. *Journal of Comparative Neurology*, 528(18):3245-3261. [link](#)
48. Nguyen, V., Uchida, R., Warling A., Sloan, L.J., Dodelson, C., Shin, R., Wicinski, B., Bitterman, K., Bertelsen, M.F., Stimpson, C.D., Schall, M., Hof, P.R., Sherwood, C.C., Manger, P.R., **Spocter, M.A.**, & Jacobs, B (2020). Comparative neocortical neuromorphology in felids: African lion (*Panthera leo leo*), African leopard (*Panthera pardus pardus*) and cheetah (*Acinonyx jubatus jubatus*). *Journal of Comparative Neurology*, 528(8), 1392-1422. [link](#)
47. Imam, A., Bhagwandin, A., Ajao, M.S., **Spocter, M.A.**, & Manger, P.R (2019). The brain of the tree pangolin (*Manis tricuspis*). IV. The brainstem and cerebellum. *Journal of Comparative Neurology*, 527(15):2440-2473. [link](#)
46. **Spocter, M.A.**, Uddin, A\*, Ng, J., Wong, E., Wang, V.X., Tang, C., Wicinski, B., Haas, J\*, Bitterman, K., Raghanti, M.R., Dunn, R., Hof, P.R., Sherwood, C.C., Jovanovik, J., Rusbridge, C., & Manger, P.R (2018). Scaling of the corpus callosum in wild and domestic canids: Insights into the domesticated brain. *Journal of Comparative Neurology*, 526(15):2341-2359. [link](#)
45. Imam, A., Bhagwandin, A., Ajao, M.S., **Spocter, M.A.**, Ihunwo, A.O., & Manger, P.R (2018). The brain of the tree pangolin (*Manis tricuspis*). II. The olfactory system. *Journal of Comparative Neurology*, 526(16):2548-2569. [link](#)
44. **Spocter, MA.**, Fairbanks, J\*, Locey, L\*, Nguyen, A\*, Bitterman, K., Dunn, R., Sherwood, CC., Geletta, S., Dell, LA., Patzke, N & Manger, PR (2018). Neuropil distribution in the anterior cingulate and occipital cortex of artiodactyls. *The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology*, 301:1871-1881. [link](#)
43. Olateju, O.I., **Spocter, M.A.**, Patzke, N., Ihunwo, A.O., & Manger P.R (2018). Neurogenesis in the hippocampus of C57BL/6J mice following chronic prenatal alcohol exposure. *Metabolic Brain Disease*, 33: 397-410. [link](#)
42. Jacobs, B., Garcia, ME., Shea-Shumsky, NB., Tennison, ME., Sloan, L., Warling, A., Schall, M., Bull, AJ., Raghanti, MA., Lewandowski, AH., Wicinski, B., Chui, HK., Bertelsen, MF., Walsh, T., Bhagwandin, A., **Spocter MA.**, Hof, PR., Sherwood, CC & Manger, PR (2018). Comparative morphology of gigantopyramidal neurons in primary motor cortex across mammals. *Journal of Comparative Neurology*, 526::496-536. [link](#)
41. Pettigrew, J.D., Bhagwandin, A., **Spocter, M.A.**, Dell, L.A., Davimes, J., & Manger, P.R (2018). Hands of living San resemble those in paleolithic stencils, not modern Europeans. *Transactions of the Royal Society of South Africa*, 73(1): 1-7. [link](#)
40. Sweigers, J., Bhagwandin, A., **Spocter, M.A.**, Kaswera-Kyamakya, C., Gilissen, E., Manger, P.R., & Maseko, B.C (2017). Nuclear organization of cholinergic, catecholaminergic, serotonergic and orexinergic neurons in two

- relatively large brained rodent species – the springhare (*Pedetes capensis*) and Beecroft’s scaly-tailed squirrel (*Anomalurus beecrofti*). *Journal of Chemical Neuroanatomy*, 3 (86): 78-91. [link](#)
39. Dell, LA., Patzke, N., **Spocter, M.A.**, Bertelsen, M., Siegel, J.M., & Manger, P.R (2016). Organization of the sleep related neural systems in the brain of the river hippopotamus (*Hippopotamus amphibius*): a most unusual Cetartiodactyl species. *Journal of Comparative Neurology*, 524 (10), 2036-58. [link](#)
  38. Dell, LA., Karlson, K.E., Patzke, N., **Spocter, M.A.**, Siegel, J.M., & Manger, P.R (2016). Organization of the sleep related neural systems in the brain of the Minke whale (*Balaenoptera acutorostrata*). *Journal of Comparative Neurology*, 524(10),2018-35. [link](#)
  37. Dell, LA., Patzke, N., **Spocter, M.A.**, Siegel, J.M., & Manger, P.R (2016). Organization of the sleep related neural systems in the brain of the harbour porpoise (*Phocoena phocoena*). *Journal of Comparative Neurology*, 524 (10),1999-2017. [link](#)
  36. Dell, LA., **Spocter, M.A.**, Patzke, N., Karlson, KA., Alagaili, A.N., Bennett, N.C., Siegel, J.M., & Manger, P.R. (2015). Orexinergic bouton density is lower in the cerebral cortex of cetaceans compared to artiodactyls. *Journal of Chemical Neuroanatomy*, 68,61-76. [link](#)
  35. Patzke, N., **Spocter, M.A.**, Karlson, KA., Bertelsen, M.F., Haagensen, M., Chawana, R., Streicher, S., Kaswera, C., Gilissen, E., Alagaili, A.N., Mohammed, O.B., Reep, R.L., Bennett, N.C., Bonfanti, L., Siegel, J.M., Ihunwo, A.O., & Manger, P.R. (2015). In contrast to many other mammals, cetaceans have relatively small hippocampi that appear to lack adult neurogenesis. *Brain, Structure and Function*, 220(1), 361-83. [link](#)
  34. Chawana, R., Alagaili, A., Patzke, N., **Spocter, M.A.**, Mohammed, O.B., Kaswera, C., Gilissen, E., Bennett, N.C., Ihunwo, A., & Manger, P.R (2014). Microbats appear to have adult hippocampal neurogenesis, but post-capture stress causes a rapid decline in the number of neurons expressing doublecortin. *Neuroscience*, 7 (277), 724-733. [link](#)
  33. Butti, C., Fordyce, R.E., Raghanti, M.A., Gu, X., Bonar, C.J., Wicinski, B.A., Wong, E.W., Roman, J., Brake, A., Eaves, E., **Spocter, M.A.**, Tang, C.Y., Jacobs, B., Sherwood, C.C., & Hof, P.R. (2014). The cerebral cortex of the pygmy hippopotamus, *Hexaprotodon liberiensis* (Cetartiodactyla, Hippopotamidae): MRI, cytoarchitecture, and neuronal morphology. *The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology*, 297 (4), 670-700. [link](#)
  32. Manger, P.R., **Spocter, M.A.**, & Patzke, N. (2013). The evolutions of large brain size in mammals- ‘the Over 700g Club Quartet’. *Brain, Behavior and Evolution*, 82 (1), 68-78. [link](#)
  31. Ngwenya, A., Patzke, N., **Spocter, M.A.**, Kruger, J., Dell, L., Chawana, R., Mazenganya, P., Billings, B.K., Olaleye, O., Herculano-Houzel, S., & Manger P.R. (2013). The continuously growing central nervous system of the Nile crocodile (*Crocodylus niloticus*). *The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology*, 296 (10), 1489-500. [link](#)
  30. Maseko, B.C., Jacobs, B, Spocter, M.A., Sherwood, C.C., Hof, P.R., & Manger, P.R. (2013). Qualitative and quantitative aspects of the microanatomy of the African elephant (*Loxodonta africana*) cerebellar cortex. *Brain, Behavior and Evolution*, 81 (4), 40-55. [link](#)
  29. **Spocter, M.A.**, Hopkins, W.D., Barks, S.K., Bianchi, S., Stimpson, C.D., Fobbs, A.J., Hof, P.R., & Sherwood, C.C. (2012). Neuropil distribution in the cerebral cortex differs between humans and chimpanzees. *Journal of Comparative Neurology*, 520(13), 2917-2929. [link](#)
  28. Maseko, B.C., **Spocter, M.A.**, Haagensen, M., & Manger, P.R. (2012). Elephants have the relatively largest cerebellum size of mammals. *The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology*, 295,661-672. [link](#)
  27. Bianchi, S., Bauernfeind, A.L., Gupta, K., Stimpson, C.D., **Spocter, M.A.**, Bonar, C.J., Manger, P.R., Hof, P.R., Jacobs, B., & Sherwood, C.C. (2011). Neocortical neuron morphology in Afrotheria: comparing the rock hyrax with the African elephant. *Annals of the New York Academy of Science*. 1225, 37-46. [link](#)
  26. Maseko, B.C., **Spocter, M.A.**, Haagensen, M., & Manger, P.R. (2011). Volumetric analysis of the African elephant ventricular system. *The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology* 298, 1412-1417. [link](#)

25. Štrkalj, G., **Spocter, M.A.**, & Wilkinson, A.T. (2011). Anatomy, medical education and human ancestral variation. *Anatomical Sciences Education*, 4(6):362-365. [link](#)
24. Štrkalj, G., Ngo, A., Park, K., Kim, G.B., & **Spocter, M.A.** (2011). Chiropractors' perceptions of the possible racial differences in response to a treatment: A pilot study. *Studies on Ethno-Medicine*, 5(3),149-151. [link](#)
23. Schenker, N.M., Hopkins, W.D., **Spocter, M.A.**, Garrison, A.R., Stimpson, C.D., Erwin, J.M., Hof, P.R., & Sherwood, C.C. (2010). Broca's area homologue in chimpanzees (*Pan troglodytes*): probabilistic mapping, asymmetry, and comparison to humans. *Cerebral Cortex*, 20, 730-742. [link](#)
22. Raghanti, M.A., **Spocter, M.A.**, Butti, C., Hof, P.R., & Sherwood, C.C. 2010. A comparative perspective on minicolumns and inhibitory GABAergic interneurons in the Neocortex. *Frontiers in Neuroanatomy*. 4, (3) 1-10. [link](#)
21. Sherwood, C.C., Raghanti, M.A., Stimpson, C.D., **Spocter, M.A.**, Uddin, M., Boddy, A.M., Wildman, D.E., Bonar, C.J., Lewandowski, A.H., Phillips, K.A., Erwin, J.M., & Hof, P.R. (2010). Inhibitory interneurons of the human prefrontal cortex display conserved evolution of the phenotype and related genes. *Proceedings of the Royal Society B*, 277, 1011-1020. [link](#)
20. **Spocter, M.A.**, Hopkins, W.D., Garrison, A.R., Bauerfeind, A., Stimpson, C.D., Hof, P.R., & Sherwood, C.C. (2010). Wernicke's area homologue in chimpanzees (*Pan troglodytes*) and its relation to the appearance of modern human language. *Proceedings of the Royal Society B*, 277, 2165-2174. [link](#)
19. Raghanti, M.A., **Spocter, M.A.**, Stimpson, C.D., Erwin, J.M., Bonar, C.J., Allman, J.M., Hof, P.R., & Sherwood, C.C. (2009). Species specific distributions of tyrosine hydroxylase immunoreactive neurons in the prefrontal cortex of anthropoid primates. *Neuroscience*, 158, 1551-9. [link](#)
18. Bidmos, M.A., **Spocter, M.A.**, & Dayal, M.R. (2008). Sexual dimorphism of the skull of black South Africans by discriminant function analysis. *Journal of Comparative Human Biology*, 59, 209-221. [link](#)
17. **Spocter, M.A.**, & Manger, P.R. (2007). The use of cranial variables for the estimation of hominin body mass. *American Journal of Physical Anthropology*, 134, 92-105. [link](#)
16. **Spocter, M.A.**, & Strkalj, G. (2007). Darwinian medicine: An evolutionary perspective to health and disease. *South African Medical Journal*, 97, 1044-1046. [link](#)

#### BOOK CHAPTERS, ENCYCLOPEDIA ENTRIES, NEWSLETTERS AND EDUCATIONAL VIDEOS

15. **Spocter, M.A.** (2022). The 42<sup>nd</sup> Annual Meeting of the J.B. Johnston. Club for Evolutionary Neuroscience and the 34<sup>th</sup> Annual Karger Workshop in Evolutionary Neuroscience. *Brain, Behavior and Evolution*. [link](#)
14. Manger, P.R., Benoit, J., Bhagwandin, A., **Spocter, M.A.**, Weisbecker, V., Farke, A.A., Rule, J.P., McDonald, A., Adams, J.W., Lang, M.M., Bertand, O.C., Racicot, R., Marino, L., Hof, P.R. Veronese do Amaral, R., Bruner, E., Neubauer, S., & Smaers, J. (Under Review). Neurothermodynamics as contributing factor shaping the mammalian brain. *In The Evolution of Nervous Systems (Volume 4): A comprehensive reference (Editor by John Kaas)*. Elsevier [Link](#)
13. **Spocter, M.A.** (2021). The 41<sup>st</sup> Annual Meeting of the J.B. Johnston. Club for Evolutionary Neuroscience and the 33<sup>rd</sup> Annual Karger Workshop in Evolutionary Neuroscience. *Brain, Behavior and Evolution*. [link](#)
12. **Spocter, M.A.** (2020). Adaptation. In: T. K. Shackelford, & V.A. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science*. New York, NY: Springer Publishing. [link](#)
11. Braken, E\*, Billings, B.K., Barnes, M. J., & **Spocter, M.A.**, (2020). The evolution of tool use. In: T. K. Shackelford, & V.A. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science*. New York, NY: Springer Cham. [link](#)
10. Finneran, K\*, Billings, B.K., Aoki, T., Barnes, M. J., & **Spocter, M.A.**, (2020). Evolutionary Medicine. In: T. K. Shackelford, & V.A. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science*. New York, NY: Springer Cham. [link](#)

9. Haas, J\*., Hass, R\*., **Spocter, M.A** & de Sousa (2020). Human Visual Neuroscience. In: T. K. Shackelford, & V.A. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science*. New York, NY: Springer Cham. [link](#)
8. **Spocter, M.A.** (2019, 24th March), Hypothesis. Video Descriptor: A short hypothesis video created for the Go2Science platform. This video provides elementary school learners with an introduction to Cetaceans and the concept of relative abundance. Retrieved from: <https://www.go2science.com>. [link](#)
7. Lemert, J\*., & **Spocter, M.A** (2018). The evolution of the brain. In: T. K. Shackelford, & V.A. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science*. New York, NY: Springer Publishing. [link](#)
6. Lemert, J\*., & **Spocter, M.A** (2018). Brain Size and Intelligence. In: T. K. Shackelford, & V.A. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science*. New York, NY: Springer Publishing. [link](#)
5. **Spocter, M.A.**, Patzke, N & Manger, P.R (2017). Cetacean Brains. *Reference Module in Neuroscience and Biobehavioral Psychology*. Elsevier. [link](#)
4. **Spocter, M.A.**, Raghanti, M.A., Butti, C., Hof, P.R., & Sherwood, C.C. (2015). The Minicolumn in a Comparative Context. In: Casanova, M & Opris, I (Editors): *Recent Advances on the Modular Organization of the Cerebral Cortex*. Springer Publishing. [link](#)
3. Manger, P.R., Hemingway, J. **Spocter, M.A.**, & Gallagher, A. (2012). The mass of the human brain: is it a spandrel. In: Reynolds, S & Gallagher, A. (eds.) *African Genesis: Perspectives on Hominin Evolution*, Cambridge Studies in Biological and Evolutionary Anthropology. Cambridge University Press. [link](#)
2. Wilkinson, A.T., Štrkalj, G., & **Spocter, M.A.** (2010). Should human variation be taught to medical students? In: Štrkalj, G. (ed.) *Teaching Human Variation: Issues, Trends and Challenges*. Hauppauge: Nova Science Publishers. [link](#)
1. **Spocter, M.A.** & Hemingway, J. (2002). New fossil hominid from Northern Chad. *DART Newsletter* (August 2002) 3:2.

#### COVER IMAGES

Cover Page- *Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology*, Volume 296. No. 10 October 2013. Reference: [ Ngwenya, A., Patzke, N., **Spocter, M.A.**, Kruger, J., Dell, L., Chawana, R., Mazenganya, P., Billings, B.K., Olaleye, O., Herculano-Houzel, S., & Manger P.R. (2013). The continuously growing central nervous system of the Nile crocodile (*Crocodylus niloticus*). *Anatomical Record (Hoboken)* 296 (10):C1]. [link](#)

Cover Page -*Brain, Behavior and Evolution*, Volume 81. No.1 January 2013. Reference: [Maseko, B.C., Jacobs, B, **Spocter, M.A.**, Sherwood, C.C., Hof, P.R., & Manger, P.R. (2013). Qualitative and quantitative aspects of the microanatomy of the African elephant (*Loxodonta africana*) cerebellar cortex. *Brain, Behavior and Evolution* 81 (4): C1. [link](#)

#### MANUSCRIPTS IN PREPARATION

5. Manger, P.R, Davis, J.G., Malungo, I.B., Ngewnya, A., B. hagwandin, A., Coimbra, J., Hazelhurst, S., Aron, S., Chase, M., Landen, K., Jillani, N.E., Bennett, N.C., Webster, A., Ganswindt, A., Herculano-Horzal, S., Sherwood, C.C., **Spocter, M.A.**, Siegal, J.M., Eickoff, S., Bertelson, M.F., Mars, R.B., Scantlebury, D.M., Witter, M., Alagaili, A.N., Ram, K., Joseph, J., & Sivaprakasam, M. (In Preparation). The plains Zebra and Ubuntu Environmentalism. *Nature Africa*. [Link](#)

4. Weinberg, I., **Spocter, M.A** & Manger, P.R. (In Preparation). Volumetry of the human basis pontis, amygdaloid body, and hippocampus proper across adulthood: validation of the basis pontis as a reference volume. *Journal of Magnetic Resonance Imaging*. Link
3. **Spocter, M.A.**, Matschke, J., Glatzel, M., Wischhusen, F., Puschel, K & Manger, P.R. (In Preparation). Human brain- body size variation: Constraints, Evolvability and our place amongst the Hominins.
2. **Spocter, M.A.**, Hemingway, J., Gallagher, A., & Manger, P.R. (In Preparation). Quantitative magnetic resonance imaging of endocranial volume in humans and other primates: Predicting fossil hominid brain weights.
1. **Spocter, M.A.**, Matschke, J., Glatzel, M., Wischhusen, F., Puschel, K & Manger, P.R. (In Preparation). Intraspecific variation in human brain mass: Towards a casual model for human brain mass variation.

#### SELECTED PUBLISHED ABSTRACTS (> 80 PUBLISHED ABSTRACTS)

19. Nguyen, V., Uchida, R., Warling A., Sloan, L.J., Dodelson, C., Shin, R., Wicinski, B., Bertelsen, MF., Stimpson, CD., **Spocter, MA.**, Schall, M., Hof, PR., Sherwood, CC., Manger, PR., & Jacobs, B (2019). Comparative neocortical neuromorphology in felids: African lion (*Panthera leo*), African leopard (*Panthera pardus pardus*) and cheetah (*Acinonyx jubatus*). 2019 Abstract Viewer/Itinerary Planner. *Society for Neuroscience, Annual Meeting 2019, Chicago*.
18. Imam, A., Ajao, MS., Bhagwandin, A., **Spocter MA.**, Ihunwo, AO., & Manger PR (2018). Chemical neuroanatomy of the olfactory system of the nocturnal tree pangolin (*Manis tricuspis*). Annual Meeting of the J.B Johnston Club for Evolutionary Neuroscience Nov, 2018, San Diego.
17. Knauf, V\*; Olds JE., Derscheid, R., Ng, JC., Wang, VX., Tang, C., Wicinski, B., Hof, PR., Sherwood, CC., Manger, PR & **Spocter, MA** (2018). Preliminary MRI and DTI atlas of the Siberian Tiger (*Pathera tigris altaica*). Annual Meeting of the Iowa Academy of Science, April 2018, Storm Lake, Iowa.
16. Tenley, J\*, Chengetania, S., Niederlander, J., Duncan, M., Ng, JC., Wang, VX, Tang C., Wicinski, B., Hof, PR., Manger, PR., & **Spocter MA** (2018). The brain of the African Painted Dog (*Lycaon pictus*: MRI atlas, diffusion tensor imaging and quantitative volumetrics. Annual Meeting of the Iowa Academy of Science, April 2018, Storm Lake, Iowa.
15. Glidden, I\*., Manger, PR, Dunn, RH., & **Spocter, MA** (2017). Using 3D surface data to reconstruct the sulcal morphology of fossil and extant canids. Annual Meeting of the JB. Johnston Club for Evolutionary Neuroscience Nov 10, 2017, College Park, Maryland.
14. Jacobs, B., Garcia, ME., Shea-Shumsky, NB., Tension, ME., Sloan, L., Warling, A., Schall, M., Bull, AJ., Raghanti, MA., Lewandowski, AH., Wicinski, B., Chui, HK., Bertelsen, MF., Walsh, T., Bhagwandin, A., **Spocter MA.**, Hof, PR., Sherwood, CC & Manger, PR (2017). Comparative morphology of gigantopyramidal neurons in primary motor cortex across mammals. 2017 Abstract Viewer/Itinerary Planner. *Society for Neuroscience, Annual Meeting 2017, Washington DC*.
- 14 Knauf, V\*, Truong, T., Le, S., Aguirre, G., Datta, R., Ng, J., Wang, VX., Tang, C., Wikinski, B., Hof, PR., Sherwood, CC., Manger, PR, & **Spocter, MA** (2017). The gyrification index of the domestic dog (*Canis lupus familiaris*). DMU Research Symposium, Des Moines University, Iowa.
- 13 Hoisington, C\*., Tang, C., Whymys, B\*., Hof, P.R., Sherwood, C.C., & **Spocter, M.A.** (2014). A preliminary MRI brain atlas of the maned wolf (*Chrysocyon brachyurus*) and domestic dog (*Canis familiaris*). 2014 Program and Abstract. Des Moines, IA: DMU Mentored Research Symposium, Online.
- 12 Summer, M., **Spocter, M.A.**, Hof, P.R., Sherwood, C.C., & Raghanti, M.R. (2012). Cross species comparisons of the retrosplenial cortex in primates: Through time and neuropil space. 2012 Program and Abstract. Dekalb IL: Annual Meetings of the Midwest Primate Interest Group, Online.

- 11 Duka, T., **Spocter, M.A.**, Hopkins, W.D., Anderson, S., Zachary, C., Stimpson, C.D., Hof, P.R., & Sherwood, C.C. (2012). A study of the lateral distribution in expression of brain specific proteins in the cerebral cortex of the common chimpanzee (*Pan troglodytes*). *Am J Phys Anthropol.* 146 Suppl 45:17-319.
- 9 Spocter, M.A., Hopkins, W.D., Bianchi, S., Stimpson, C.D., Fobbs, A.J., Hof, P.R., & Sherwood, C.C. 2011. Neuropil asymmetry in the cerebral cortex of humans and chimpanzees (*Pan troglodytes*): implications for the evolution of unique cortical circuitry in the human brain. *Am J Phys Anthropol.* 144 Suppl 52:17-319.
8. Brits, D., Billings, B., Dayal, M.R., & **Spocter, M.A.** 2011. The use of foramen magnum dimensions for sex determination in an indigenous South African population. *Am J Phys Anthropol.* 144 Suppl 52:17-319.
7. Manger, P.R., Matschke, J., Glatzel, M., Wischhusen, F., Puschel, K., & **Spocter, M.A.** 2011. Human intraspecific brain and body size correlations: towards a casual model for human brain mass variation. *Am J Phys Anthropol.* 144 Suppl 52:17-319.
- 7 Sherwood, C.C., Raghanti, M.R., Stimpson, C.D., **Spocter, M.A.**, Bonar, C.J., Phillips, K.A., Allman, J.M., Erwin, J.M., & Hof, P.R. 2009. Inhibitory interneurons and the evolution of human frontal cortex. *Am J Phys Anthropol.* 2009; 140 Suppl 4:771-87.
- 5 Wilkinson, T., Strkalj, G., & **Spocter, M.A.** 2009. Should biological variation be taught to medical students. 2009 Abstract Viewer/Itinerary Planner. Cape Town: 17<sup>th</sup> Conference of the International Federation of Associations of Anatomists, Online.
- 5 Butti, C., Bauerfeind, A., **Spocter, M.A.**, Marino, L., Manger, P.R., Wicinski, B.A., Raghanti, M.A., Sherwood, C.C. & Hof, P.R. 2009. The Glial-neuron index in the neocortex of Cetartiodactyla and Afrotheria: Implications for mammalian brain evolution. 2009 Abstract Viewer/Itinerary Planner. Chicago: Society for Neuroscience, Online.
- 4 **Spocter, M.A.**, Hopkins, W.D., Garrison, A.R., Bauerfeind, A., Stimpson, C.D., Erwin, J.E., Hof, P.R., & Sherwood, C.C. 2009. Wernicke's area homolog in chimpanzees (*Pan troglodytes*): Probabilistic mapping, asymmetry and comparison with humans. 2009 Abstract Viewer/Itinerary Planner. Chicago: Society for Neuroscience, Online.
- 3 **Spocter, M.A.**, & Manger, P.R. 2006. The Panglossian paradigm revisited: The role of non-adaptive mechanisms in hominid brain and body size evolution. Abstract Viewer/Itinerary Planner, *African Genesis Symposium, Johannesburg, SA.*
2. Chiba, M., **Spocter, M.A.**, & Manger, P.R. 2006. An assessment of cranial and post-cranial skeletal variation and co-variation in humans and baboons: Implications for paleospecies. Abstract Viewer/Itinerary Planner, *African Genesis Symposium, Johannesburg, SA.*
1. **Spocter, M.A.**, & Manger, P.R. 2006. Quantitative magnetic resonance imaging of endocranial volume variation in humans and other primates: Implications for hominid species. *Proceedings of the University of Witwatersrand, Health Science Research Day, Johannesburg, SA.*

### **TEACHING AND ADVISING EXPERIENCE**

#### **Primary Instructor**

Research Orientation Module in Comparative Neuroanatomy (SC1531, SC1532) DMU F2012- present  
 Introduction to Physical Anthropology (ANTH5), UCSB, F2007  
 Evolutionary Medicine Seminar (ANTH 197), UCSB, S2008; DMU, Spring 2015-present  
 Community Health Immersion Project (INST2071), DMU Spring, 2014-present

#### **Guest Lecturer or Guest Faculty assisting with Laboratory Instruction**

Human Neuroanatomy (DO/DPM/MSA), Department of Anatomy DMU, S2012 – present  
 Gross Anatomy (DO/DPM/MSA/PA), Department of Anatomy, DMU, F2011- present



DPT Foundational Sciences Neuroanatomy, Department of Anatomy, DMU, F2012- present  
Average yearly workload: DO- (16 lectures, 43 Labs); DPT-(4 lectures, 15 Labs); PA- (6 Lectures, 7 Labs)

Evolution of the Human Brain (ANTH 149/249) (1 lecture), Dept. of Anthropology, GWU, F2008  
Mind, Brain and Evolution (ANTH 721) (1 lecture), Dept. of Anthropology, GWU, F2009  
Human Evolution (1 lecture), Dept. of Anatomy, Wits, S2004

### **Teaching Assistant**

Clinical Skills instructor and Examiner, Graduate Entry Medical Program, Wits, 2006-7  
Problem Based Learning Facilitator and Examiner, Graduate Entry Medical Program, Wits, 2006-7  
Modular Course in Advanced Neuroanatomy, Dept. of Anatomy, Wits, 2004  
Human Biology III, Dept. of Anatomy, Wits, 2004  
Human and Comparative Anatomy II, Dept. of Anatomy, Wits, 2003  
Medical Cell Biology II, Dept. of Anatomy, Wits, 2003

### **Course Coordination:**

Respiratory (SYST-2114\*01) (DO/PA), Des Moines University 2012-present  
MSA Research (MSA-2A07) 1-6 credits, DMU 2015- present  
Research Orientation Module in Comparative Neuroanatomy (SC1531, SC1532) DMU F2012-present  
Community Health Immersion Project (INST2071), DMU Spring, 2014-present  
Evolutionary Medicine Seminar (INST2075), DMU Spring 2015

### **Continuing Medical Education Instructor**

Neuroanatomy Review and Dissection Laboratory, DPT Professionals, DMU, 2013, 2018.  
Neuroanatomy Workshop, Kemin Representatives, DMU, 2014.

### **Academic Advisor or Thesis Committee**

Senior Honors Thesis, Manoj Chiba (2005) Examining cranial and post-cranial variation and co-variation in *Homo sapiens* and *Papio Ursinus*. Co-supervisor, School of Anatomical Sciences, University of the Witwatersrand.  
BSc III Group research projects: Secular trends in lower limb bone lengths in indigenous South Africans, An assessment of sexual dimorphism in *Homo sapiens* and *Papio Ursinus*, Femoral and tibial bone remodelling of *Homo sapiens* and *Papio Ursinus*. Co-supervisor, School of Anatomical Sciences, University of the Witwatersrand.

Master's Thesis, Mitch Summer (2011-2013) Cross species comparisons of the retrosplenial cortex in primates: Through time and neuropil space. Thesis Committee: Department of Anthropology and School of Biomedical Sciences, Kent State University.

Master's Thesis, Misty Lea Carder (2014-2016) Molecular and physiological mechanisms associated with the comorbidity of chronic pain and depression. Thesis Committee: Department of Physiology and Pharmacology, Des Moines University.

Master's Thesis Elizabeth Deforest (2017-2018) Stress, pain and hypertension. Thesis Committee: Department of Physiology and Pharmacology, Des Moines University.

PhD Thesis, Samson Chengetanai (2016-2020) Mapping the Brain of the African Painted Dog (*Lycaon pictus*). Co-Supervisor: School of Anatomical Sciences, University of Witwatersrand, South Africa.

Master's Thesis Ian Weinberg (2023-Present) Amygdaloid and hippocampal volumetric variations across age and the effects of the feeling of hopelessness and helplessness. Co-Supervisor: School of Anatomical Sciences, University of Witwatersrand, South Africa.

PhD Thesis, Demi Oddes (2024-Present) Mapping the Brain of the South American Bush Dog. Co-Supervisor: School of Anatomical Sciences, University of Witwatersrand, South Africa.

### External Examiner

Master's Thesis, Lauren Williams (2018). The effects of domestication on cerebellar morphology and brain composition: comparing wild rats (*Rattus norvegicus*) to laboratory rats. Department of Neuroscience, University of Lethbridge, Alberta, Canada.

PhD. Thesis, Marilee Greef (2020). The morphology of the intraparietal sulcus in children prenatally exposed to alcohol in a sample of children from the Western Cape, South Africa and its potential relationship with number processing. Department of Anatomy, University of Cape Town, South Africa.

Master's Thesis, Patience Mamali (2023). Assessing synapto-pathology in a valproic acid Sprague-Dawley rat model of Autism, a special focus on PSD-95 and VGLUT1, School of Anatomical Sciences, University of Witwatersrand, Johannesburg, South Africa.

### RESEARCH INTERNSHIPS DIRECTED

More than >60 research internships offered to medical and allied biomedical students. Only select names listed. Brian Whyms, DMU DO student (2012-14); David Cain, DMU graduate student (2012-14), Naveen Nath, Roosevelt High School (2012) currently at Duke University; Emma Fisher, Roosevelt High School (2012) currently at University of Wisconsin; Kayla Olson, DMU graduate student (2013-14); Amy Nguyen, Psychology Major Drake University (Fall 2013); Sophonie Nash Dusabe, Drake University capstone experience (Fall 2014); Jeremiah Fairbanks, DMU DO student (2014); Michael Conte, DMU DO student (2014); Christopher Hoisington, Iowa State University (2014); Samantha Lord, DMU MSA Student (2014-2016); Ian Odigie, DMU DPM Student (2012-2016); Iaswarya Ganapthiraju DO Student (2015); Christopher Girado DO Student (2015); Ashraf Uddin DO Student (MSRP 2015); Steven Rose, DO Student (MSRP 2015); George Zak, MSA Student (2016); Cody Howe DO Student (2016); Victoria Knauffman DPM Student (MSRP 2016); Lisa Locey Le Hang DO Student (2016); Jonathan Tenley DPM Student (MSRP 2017); Pavel Phillipov DPM Student (MSRP 2018); Brittany Wilson DO Student (MSRP 2019); Jacob Nelson DO Student (MSRP 2019); Erin Marie Woeste DO Student (2019); Jagmeet Singh Grewal DO Student (2019); Tyler Gloe DO Student (2019); Joseph Hegedus DO Student (2019); Vernon Tate DO Student (2020); Nathaniel Brendon Adams DO Student (2020); Boston Murdoch DO Student (2020); Jasmeet Sandhu DO Student (MSRP 2020); Darian Garcia (Simpson College MSRP 2020- awarded not completed due to pandemic); Haley Maree Spector DO Student (MSRP 2021); Rhiannon Ross (MSA); LeAndre Kennedy (DPM); Oscar Gryn (DO); Ankit Chopra (DO); Nathaniel Adams (DO); Zack Smallwood (MSA); Austin Teel (DO); Brandon Marth (MSA); Stephan Lilly (DO); Michael Foster (DO); Stephan Chauncey Havig (DO); Lee Crystal (DO);

### FUNDING, AWARDS AND PROPOSALS

#### Extramural Research Support

2018-19	Sub-award: M.A. Spocter. Iowa STEM BEST (Businesses Engaging Students and Teachers) Award. Bridging the Gap Between Science and Start-up: Neuro-SMART -An innovative neuroscience program with a joint emphasis in science and business skills development – Des Moines Independent Community School District in the South-Central STEM Region (total: \$25 000)
2016-21	PI: M.A. Spocter. Kemin Industries: Human Nutrition and Health Division. Neuro-SMART (Neurosciences Student Mentoring and Research Training) Program – STEM Program for Des Moines High School Students (total: \$20 000)
2016-17	PI: M.A. Spocter. The Iowa Academy of Sciences Research Activity Support, Histological asymmetries in the amygdala of the common chimpanzee ( <i>Pan troglodytes</i> ): Correlates with language areas and insights into neurodevelopmental disorders (total: \$3 500)
2014-15	Sub-award: M.A Spocter (\$17 600). PI: Kacia Cain (DMPS). Verizon Foundation Innovative Learning Grant: Brain Histology STEM Lab (total: \$20 000)

- 2012-13 PI: M.A. Spocter. The Iowa Academy of Sciences Research Activity Support, Mans' best friend and the neural substrate supporting social cognition in canids: Domestication, convergent evolution and insights into the emergence of human sociality (total: \$5 000)
- 2004-07 PI: M.A. Spocter. The Paleontological Scientific Trust (PAST) Research Activity Support, The Panglossian paradigm revisited: The role of non-adaptive mechanism in hominid brain and body size evolution (total \$5 142)
- 2004-07 PI: Paul Manger, Co-PI: M.A. Spocter. The National Research Foundation (NRF, South Africa) Grant Holder linked bursary for graduate study, The Panglossian paradigm revisited: The role of non-adaptive mechanism in hominid brain and body size evolution (total \$9 428)

#### **Intramural Research Support**

- 2014-15 PI: M.A. Spocter. The R&G IOER –FAC Award, Des Moines University, Neuropil distribution in the Cetartiodactyls: From donkeys to dolphins, a walk-through time and neuropil space (total: \$2 500)
- 2012-13 PI: M.A. Spocter. The R&G IOER –FAC Award, Des Moines University, Mans' best friend and the neural substrate supporting social cognition in canids: Domestication, convergent evolution and insights into the emergence of human sociality (total: \$5 100)
- 2011-13 PI: M.A. Spocter. IOER-FAC Startup Award, Des Moines University. Identifying the neurobiological mechanisms associated with individual and species differences in hemispheric specialization (total: \$86 000)
- 2003 PI: M.A. Spocter. Makapansgat Research Bursary in Paleoanthropology Wits University, Scaling of foramen magnum area and other cranial variables with body size (total \$850)

#### **Fellowship Awards**

- 2022-2023 Carnegie-Wits Alumni Diaspora Fellowship Program- Renewal of Project Funding: Mapping the brain of the African Painted Dog (*Lycaon pictus*) – A comprehensive description of the Somatomotor area: Visiting Scholar: PI: M.A. Spocter (Des Moines University); Host Institute: PI: P.R. Manger (University of Witwatersrand, South Africa).
- 2019-20 Carnegie-Wits Alumni Diaspora Fellowship Program- Renewal of Project Funding: Mapping the brain of the African Painted Dog (*Lycaon pictus*) – Histochemical analysis of the limbic system: Visiting Scholar: PI: M.A. Spocter (Des Moines University); Host Institute: PI: P.R. Manger (University of Witwatersrand, South Africa).
- 2017-18 Carnegie-Wits Alumni Diaspora Fellowship Program- Mapping the brain of the African Painted Dog (*Lycaon pictus*) – Preliminary MRI and volumetrics: Visiting Scholar: PI: M.A. Spocter (Des Moines University); Host Institute: PI: P.R. Manger (University of Witwatersrand, South Africa).
- 2008-11 Postdoctoral Fellowship, National Institutes of Health (NS42867) PI: W.D. Hopkins, Co PI: Chet Sherwood, GWU.

#### **Proposals Submitted**

- 2021 PI: M.A. Spocter. ACT Health Equity Grant. Des Moines University, Minorities in Health Sciences Collaborative
- 2018 Sub-award & Co-PI: M.A. Spocter. Iowa STEM BEST (Businesses Engaging Students and Teachers) Award. Bridging the Gap Between Science and Start-up: Neuro-SMART -An innovative neuroscience program with a joint emphasis in science and business skills development – Des Moines Independent Community School District in the South-Central STEM Region
- 2017 Carnegie-Wits Alumni Diaspora Fellowship Program- Mapping the brain of the African Painted Dog (*Lycaon pictus*): A collaborative research and graduate student training project in quantitative neuroscience. Visiting Scholar: PI: M.A. Spocter (Des Moines University); Host Institute: PI: P.R. Manger (University of Witwatersrand, South Africa).
- 2016 Carnegie African Diaspora Fellowship Program- The Institute for International Education: Mapping the brain of the African Painted Dog (*Lycaon pictus*): A collaborative research and graduate student training

- project in quantitative neuroscience. Visiting Scholar: PI: M.A. Spocter (Des Moines University); Host Institute: PI: P.R. Manger (University of Witwatersrand, South Africa).
- 2016 PI: M.A. Spocter. The Telligen Foundation: Health Careers and Diversity Pathway (HCDP): Des Moines University- Minorities in Health Sciences Collaborative (MHSC).
- 2016 PI: M.A. Spocter. The Iowa Science Foundation: Asymmetries in the amygdala of the common chimpanzee (*Pan troglodytes*): Correlates with language areas and insights into neurodevelopmental disorders.
- 2015 PI: M.A. Spocter. National Science Foundation Preliminary Proposal (#1529300): From Big Bad Wolf to Man's Best Friend: Domestication and its Effects on the Canid Brain.
- 2014 PI: Kacia Cain; Co-PI: Julie Rosin; Subaward: M.A. Spocter. Verizon Foundation Innovate Learning Grant (Pre-proposal) Brain Histology STEM Lab Project.
- 2014 PI: Kacia Cain; Co-PI: Julie Rosin; Subaward: M.A. Spocter. Gannett Foundation Grant; Brain Histology STEM Lab Project.
- 2014 PI: M.A. Spocter. Simons Foundation Autism Research Initiative (SFARI) Explorer Award; Proposal (#312409): The Canid Brain and Autism: An evolutionary Framework to Study the Amygdala.
- 2014 PI: M.A. Spocter. National Science Foundation CAREER Proposal (#1452983): From Big Bad Wolf to Man's Best Friend: Domestication and its Effects on the Canid Brain.  
Panel recommendation: Medium Priority.
- 2014 PI: M.A. Spocter. DOD Autism Research Program ARP2014 Pre-proposal (#AR140179): Mans' best friend and insights into Autism.
- 2014 PI: M.A. Spocter. American Association of Physical Anthropologists Professional Development Grant: Asymmetries in the amygdala of the common chimpanzee (*Pan troglodytes*): Correlates with language areas and insights into neurodevelopmental disorders.
- 2014 PI: M.A. Spocter. The Iowa Academy of Sciences Research Activity Support: Histological asymmetries in the amygdala of the chimpanzee.
- 2013 PI: M.A. Spocter. National Science Foundation Preliminary Proposal (#1326265): Exploring the neural substrates of social cognition in canids.
- 2013 Co-PI: M.A. Spocter. Iowa State University, Minds of Tomorrow K12 Grants Fall 2013 Proposal: Research Orientation Module in Comparative Neuroanatomy.
- 2012 PI: M.A. Spocter. National Science Foundation CAREER Proposal (#1253830): Exploring the neural substrates of social cognition in canids. Panel recommendation: Medium Priority. Resubmission- July 2014.

#### **Awards**

- 2017 Iowa Campus Compact, Engaged Campus Award: Honorable mention- Category: Civic Mission. In recognition of dedication to community engagement.
- 2016 Multicultural Affairs 2016 Diversity Champion Award, Multicultural Affairs DMU. In recognition of invaluable contributions to diversity and inclusive programming at Des Moines University.
- 2013 Awarded the Outstanding Business Partner Recognition Award, Des Moines Public Schools Central Campus for partnership with the Anatomy/Physiology program at Central Campus 2012-2013 school year.

#### **ORGANIZED SYMPOSIA & WORKSHOPS**

- 2021 JBJC Inaugural Spring Virtual Symposium: Peace through Hepetofauna (PEO JBJC)
- 2020 Annual Meeting of the J.B. Johnston Club for Evolutionary Neuroscience, Crystal City, Maryland. (Program Committee, incoming PEO JBJC)
- 2019 Anatomy & Physiology Teachers- Two Day Neuroanatomy Workshop, July 2019 - [Link](#)
- 2019 Annual Meeting of the J.B. Johnston Club for Evolutionary Neuroscience, University Center, Chicago, Illinois. (Program Committee)

- 2018 Annual Meeting of the J.B. Johnston Club for Evolutionary Neuroscience, Friday 2<sup>nd</sup> Nov. Horton Grand Hotel, San Diego, CA. (Program Committee)
- 2017-18 *Neuroanatomy in an Afternoon*: ISTS Elements of STEM Conference- Iowa Science Teaching Section, Ankeny, Iowa, 9<sup>th</sup> October 2017 & 2018.
- 2006 African Genesis Symposium: Perspectives on Hominin Evolution. Symposium held at the University of the Witwatersrand Medical School, Johannesburg, South Africa 8-14 January 2006.

### **INVITED PRESENTATIONS**

- 2022 DUCURS 2022, 19<sup>th</sup> Annual Drake University Conference on Undergraduate Research in the Sciences. Keynote Address: Casting a wide net: The importance of diversity for the neurosciences. (location: Drake University, (Des Moines, Iowa USA) [link](#))
- 2022 *The comparative anatomy of cortical folding in Canidae*. (location: Department of Biomedical Sciences, Iowa State University, (Ames, Iowa USA))
- 2021 *Why does the cerebral cortex fissure and fold: Determinants of sulci and gyri*. (location: Department of Anthropology, Stony Brook University, (New York, USA))
- 2020 *Community Engaged Scholarship for the Basic Sciences*. (location: University of Witwatersrand, (Johannesburg, South Africa) Carnegie-Wits Alumni Diaspora Program).
- 2019 *Community Engaged Scholarship for the Basic Sciences*. (location: Iowa State University, (Ames) BMS luncheon seminar series).
- 2018 *From Big Bad Wolf to Man's best friend: Domestication and its Effect on Canid Brain size*. (location: University of Arizona, (Tucson) Cognitive Science Colloquium Series).
- 2018 *Community engaged scholarship: A research orientation module in comparative neuroscience*. (location: University of Witwatersrand, Johannesburg, Medical School).
- 2016 *Domestication and the Canid Brain*. (location: Iowa State University, Veterinary Medicine BMS Series).
- 2013 *The Blind Men, the Elephant and the Neurotic Ape*. (location: Des Moines University, Faculty Development Friday Seminar Series).
- 2012 *Reconstructing the evolutionary history of the human brain: Insights from comparative neuroanatomical studies in great apes and canids*. (location: Des Moines University, Faculty Development Friday Seminar Series).
- 2012 The Descent of Mind: Reflections on Human brain evolution and the cognitive abilities of early hominids. (location: Des Moines Public Schools Central Campus, Physio/Anatomy & Biotechnology class).
- 2011 *Sizing up Hominids: Beyond Pangloss and spandrels and into a new perspective for brain and body size change*. (location: Des Moines University, Faculty Development Friday Seminar Series).
- 2011 *Homologues of human language areas in chimpanzees (Pan troglodytes): Reconstructing the evolutionary history to the emergence of human language*. (location: University of Iowa, Neuroscience Graduate Seminar series, Ames).
- 2011 HOT (Human Origins Today) Topic: *Brain maps and the evolution of human language* (location: Smithsonian National Museum of Natural History, Washington, DC).
- 2011 *Comparative studies on the homologues of Brocas and Wernickes area in chimpanzees (Pan troglodytes)*. (location: University of Witwatersrand, School of Anatomical Sciences, Johannesburg, South Africa).
- 2011 *Homologues of human language areas in chimpanzees (Pan troglodytes): Probabilistic mapping, asymmetry and the hominid fossil record*. (location: Des Moines University, Department of Anatomy, Des Moines).
- 2011 *Homologues of human language areas in chimpanzees (Pan troglodytes): Reconstructing the evolutionary history to the emergence of human language*. (location: Midwestern University, Department of Anatomy, Chicago).
- 2008 *Does Size matter? Fallacies of progressionism in Hominin brain and body size reconstructions*. (location: UCSB, Department of Anthropology, Audience: Anthropology Student Union, Santa Barbara, CA).

- 2008 *Sizing up Hominins: Beyond Pangloss and Spandrels and into a new perspective for brain and body size change.* (location: GWU, Department of Anthropology, Washington, DC).
- 2008 *To Africa and back, 7 million years of evolution in an afternoon* (Audience: Wellesley Alumnae Club of Santa Barbara).
- 2008 *Transformations of body and mind as revealed through the fossil record.* (location: UCSB, Department of Anthropology, Audience: Anthropology Student Union, Santa Barbara, CA).
- 2007 *The Panglossian Paradigm Revisited: The role of non-adaptive mechanisms in hominid brain and body size evolution* (location: UCSB, Department of Anthropology, Santa Barbara, CA).

#### **FIELD EXPERIENCE/WORKSHOPS**

- 2016 Ace Leadership Academy Workshop, Georgetown University, Washington, DC., USA.
- 2014 GWSW: Grant Writers Seminar & Workshop, Des Moines, IA. Instructor: Dr. J. Robertson.
- 2013 Cultural and linguistic competency and diversity: Imperatives for the 21<sup>st</sup> Century and beyond. Instructor: Dr. Patti Rose.
- 2012 Field Perfusion methods in neuroscience, South Africa. Instructor: Dr. Paul Manger.
- 2003 Makapansgat Excavation Team, Limeworks deposit South Africa. Directorship: Drs. Jeff McKee, Glen Conroy & Kevin Kuykendall.
- 2001-2 Human Biology III Hominin Field Lab, Makapansgat, Polekwane, South Africa.
- 2001-2 Paleoanthropology Field School Teaching Assistant at Makapansgat South Africa and Buffalo Cave deposits. Supervisor: Dr. Kevin Kuykendall

#### **PUBLIC UNDERSTANDING OF SCIENCE**

- 2020-present Guest Lecturer—Anatomy & Biotech Class (Mrs Kacia Cain), Winterset High School.
- 2019 Guest Lecturer—Biology Class (Mrs Peg Conlon), Dowling Catholic High School.
- 2014- present Guest Lecturer and poster evaluator—Anatomy & Physiology and Biotechnology, Central Campus, Des Moines Public Schools.
- 2013/14 3D Modeling of the Brain, afternoon laboratory rotation hosted for 7<sup>th</sup> and 8<sup>th</sup> graders from the TAG program, Virtual Reality Class, Boone School District.
- 2012-present Research Orientation Module in Comparative Neuroanatomy. Designed to foster an interest in science amongst high school students from under-represented groups. Collaborative undertaking with the Des Moines Public Schools Central Campus.
- 2012 Summer Camp at the Science Center of Iowa, afternoon laboratory rotation hosted for 7<sup>th</sup> and 8<sup>th</sup> graders at the DMU Evolving Brain Laboratory
- 2010- 11 Human Origins Display '*The Scientist is In*' outreach program, Smithsonian National Museum of Natural History, Washington, DC.
- 2003-7 *Paleotours: Lectures on South African Paleoanthropology and a guide to understanding the fossil hominid bearing sites of Sterkfontein, Swartkraans and Drimolen.* Coordinated by Dr. Collin Mentor and Mrs Marianne Robertson.
- 2005 Wits open day talk: '*Careers and Research in Physical Anthropology*'
- 2005 Coordinator of third year science student Paleoanthropology excursion to Makapansgat Valley in the Cradle of Humankind, South Africa.
- 2003 Team member involved with the setup of fossil hominid display in the Wits Medical School Adler Museum.

#### **PROFESSIONAL, DEPARTMENT, AND COMMUNITY SERVICE**

##### **Project Reviewer**

- 2021,22 Faculty rating, National Research Foundation (NRF), South Africa
- 2021 Reviewer, National Science Foundation (NSF) -Anthropology

2019	Reviewer, Canada Research Chairs Program (CRCP)
2019	Reviewer, National Science Foundation (NSF) -Anthropology
2018 – present	Project Reviewer, Iowa Academy of Sciences (IAS)
2016	Project Reviewer, National Science and Engineering Research Council of Canada (NSERC)
2014-17	Project Reviewer, Leakey Foundation
2014-15	Project Reviewer, Wenner Gren Foundation
2012-present	Project Reviewer, National Research Foundation (NRF), South Africa
2011-present	Project Reviewer, Iowa Junior Academy of Sciences (IJAS) Students Program Committee

### **University Committee Service**

2023- 2024	DMU Research & Grants Committee
2020- present	DMU Faculty and Staff Diversity Council (FSDC) – Co-chair
2020- 2023	DMU Promotion and Tenure Protocol Faculty Review Panel
2018- 2022	DMU Student Appeals Committee
2015- present	DMU Graduate Council
2017- present	DMU Academic, Logistics, Learning and Planning Team (ALPT)
2015 -2018	DMU Educational Resources Committee
2015 -2019	DMU Spotlight Committee/ University Engagement Committee
2013- present	DMU Biomedical Sciences (BMSCC) Committee
2013-15	DMU Faculty Facilities Committee, Chair
2013	DMU COM Nominating Committee
2012- 15	DMU Faculty Facilities Committee
2012- 15	DMU University Facilities Committee

### **University *ad hoc* committees**

2022	DMU COM Strategic Plan 2024 Taskforce: Research
2019-20	DMU COM Strategic Plan Taskforce 2: Faculty and student scholarship
2018	DMU Search Committee –Associate Information Officer (AIO)
2017	DMU Search Committee –Anatomy
2014- 15	DMU Ultrasound (Curriculum) Task force
2014-15	DMU Munroe Building Renovation Committee
2014	DMU Search Committee –Director for Teaching and Learning (CTL)
2013-14	DMU Library and CTL Renovation Committee
2012/13	DMU Search Committee –Anatomy (recruiting three faculty)
2011	DMU Department of Anatomy, Strategic Planning Committee

### **Student Club Advisor/Committee**

2017	DMU DO Student of the Year 2018 Awards Committee
2016- present	DMU Muslim Student Association – Club Advisor
2014- present	DMU Neurology Student Association – Club Advisor
2013- 15	DMU Student National Medical Association (SNMA) – Club Advisor

### **Advisory Committee**

2011- 15	DMU Global Health Faculty Committee
2013-14	DMU Faculty Technology Committee

### **Extramural Service**

2020	Invited Listening Session, The Paul G. Allen Frontiers Group (Outliers in Neuroscience)
2019-Present	Board of Directors, Science Center of Iowa (SCI) <a href="#">link</a>

2017-2020	Board of Directors, Iowa Academy of Science (IAS) <a href="#">link</a>
2020- 2025	Principal Executive Officer, J.B. Johnson Club for Evolutionary Neuroscience <a href="#">link</a>
2025- present	Treasurer, J.B. Johnson Club for Evolutionary Neuroscience <a href="#">link</a>
2020- present	IACUC Committee Chair, Ape Cognition and Conservation Initiative (ACCI) <a href="#">link</a>
2015- present	IACUC Committee member, Ape Cognition and Conservation Initiative (ACCI) <a href="#">link</a>
2017- 2020	Program Committee, J.B. Johnson Club for Evolutionary Neuroscience <a href="#">link</a>
2013- 2018	Webmaster, J.B. Johnson Club for Evolutionary Neuroscience
2012- present	Committee Member, Central Campus (DMPS) Advocacy Committee
2012- present	Committee Member, Iowa Academy of Sciences Student Programs Committee

### Editorial positions

2022- present	<u>Editorial Board</u> : <i>Brain, Behavior and Evolution</i> <a href="#">link</a>
2022- present	<u>Review Editor</u> : <i>Frontiers in Mammal Science</i>
2018- present	<u>Review Editor</u> : <i>Frontiers in Neuroanatomy</i> <a href="#">link</a> ;
2010- present	Articles reviewed for: <i>Proceedings of the Royal Society of London: B; Journal of Human Evolution, Studies on Ethno Medicine, Neuroscience and Biobehavioral Reviews, Clinical Anatomy, Frontiers in Neuroanatomy, Journal of Comparative Neurology, Frontiers in Human Neuroscience, PLOS One, Frontiers in Systems Neuroscience, DMU Journal of Biomedical Student Research; Anatomical Sciences Education, Brain, Behavior and Evolution; Journal of King Saud University, Cerebral Cortex, Forensic Science International – Reports, Hippocampus, Frontiers in Mammal Science, Brain, Structure and Function.</i>

### MEDIA COVERAGE, ARTICLES, SOCIAL MEDIA

13. Puppy-dog eyes in wild canines sparks rethink on dog evolution:  
<https://www.nature.com/articles/d41586-024-01315-x>  
<https://www.scientificamerican.com/article/puppy-dog-eyes-in-wild-canines-sparks-rethink-on-dog-evolution/>
12. Big cetacean brains generate lots of heat, 2021: <https://www.dmu.edu/news/2021/03/big-cetacean-brains-generate-lots-of-heat/>
11. DMU-Faculty, students generate neuro research despite COVID, 2020:  
<https://www.dmu.edu/news/2020/10/dmu-faculty-students-generate-neuro-research-despite-covid-19/>
10. DMU-Based Program Earns Iowa STEM BEST Award, 2019: <https://www.dmu.edu/dose/2019/01/dmu-based-program-earns-iowa-stem-best-award/>
9. Central's NeuroSMART. Honored as Iowa STEM BEST. Program, 2019:  
<https://www.dmschools.org/2019/01/central-campus-neurosmart-honored-iowa-stem-best-program/>
8. Some Brainy Investigations at DMU, 2018: <https://www.dmu.edu/dose/2018/09/some-brainy-investigations-at-dmu/>
8. DMU Inspires High School STEM Students, 2018: <https://www.dmu.edu/dose/2018/04/dmu-inspires-high-school-stem-students/>
5. Carnegie-Wits African Diaspora Fellowship, 2018: <https://www.dmu.edu/dose/2018/02/faculty-spotlight-muhammad-spocter-ph-d/>
6. Central Students Head to Med School to Share Research, 2017:  
<https://www.dmschools.org/2017/12/central-students-head-med-school-share-research/>
5. Verizon Grant to Expand DMU-DMPS partnership, 2017: <http://www.dmschools.org/2014/12/verizon-grant-to-expand-dmps-dmu-partnership/>
4. High schoolers help advance brain research, 2016: <https://www.dmu.edu/dose/2015/06/high-schoolers-help-advance-canine-brain-research/>



3. Mentioned in the GW Hatchet: Cutting through the Mind, 4/27/2012 Online  
[HTTP://WWW.GWHATCHET.COM/2009/04/27/CUTTING-THROUGH-THE-MIND/](http://www.gwhatchet.com/2009/04/27/cutting-through-the-mind/)
2. Mentioned in the book: *Growing up on the spectrum: A guide to life, love and learning for teens and young adults with Autism and Asperger's* (p245-246). Section written by a former student from UCSB.  
<https://www.penguinrandomhouse.com/books/304497/growing-up-on-the-spectrum-by-lynn-kern-koegel-phd-and-claire-lazebnik/9780143116660/>
1. To read about the African Genesis Conference, which I helped organize, see Pearson, O. 2006. Tobias and Taung Turn Eighty. *Evolutionary Anthropology* 15:79-82.  
<https://onlinelibrary.wiley.com/doi/pdf/10.1002/evan.20097>

### **PROFESSIONAL SOCIETIES**

American Association of Physical Anthropologists, Society for Neuroscience, J.B. Johnston Club for Evolutionary Neuroscience (Satellite of the Society of Neuroscience), The Iowa Academy of Science, The Asian-Australasian Association of Paleoanthropology.

### **REFERENCES**

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**\*Additional references available upon request.**