(Revised March 31, 2023)

WAKE FOREST SCHOOL OF MEDICINE

Curriculum Vitae Elements

NAME: Benjamin A. Rowland, Ph.D.

CURRENT ACADEMIC TITLE: Professor

EDUCATION:

2000	University of North Carolina at Chapel Hill Chapel Hill, NC B.S. Psychology
2004	University of Louisiana at Lafayette Lafayette, LA Ph.D. Cognitive Science Research Advisor: Anthony Maida, Ph.D. Thesis: A mathematical model of novelty detection and episodic memory in the mammalian hippocampus

POSTDOCTORAL TRAINING:

2004-2007	Postdoctoral Research Fellow, (NIH 5T32-DC00057) Department of Neurobiology and Anatomy Wake Forest University School of Medicine

EMPLOYMENT:

Academic/Research Appointments:

2021-Present	Professor, Department of Neurobiology and Anatomy
2015-2021	Associate Professor, Department of Neurobiology and Anatomy
2007-2015	Assistant Professor, Department of Neurobiology and Anatomy
2007-Present	Member, Neuroscience Program
2012-Present	Graduate School Faculty
2004-2007	Postdoctoral Research Fellow, Wake Forest School of Medicine
2000-2004	Research Assistant, Institute of Cognitive Science, UL-Lafayette

OTHER PROFESSIONAL APPOINTMENTS AND INSTITUTIONAL SERVICE:

Institutional Committee Service

2014-Present	Faculty Development Committee
2016-Present	Institutional Animal Care and Use Committee
2019	Dean's BMSC MS Committee

Departmental Committee Service

2012-Present	Faculty Search Committee, Neurobiology and Anatomy
2014-Present	Student Advisory Council, Neuroscience Program
2019-Present	Neuroscience website manager

Academic

2014-Present	Course Director, Quantitative Methods in Bioscience
2017-Present	Course Director, Cognitive Neuroscience
2020-Present	Course Director, Advanced Multivariate Analysis

EXTRAMURAL APPOINTMENTS AND SERVICE:

Professional:

2016-Present	President, Western NC chapter of Society for Neuroscience
2020-Present	Sci. Com., International Multisensory Research Forum

Journal Reviewer:

Journal of Neuroscience
Neuron
Cerebral Cortex
PNAS
Journal of Neurophysiology
Journal of Vision
Scientific Reports
Experimental Brain Research
Frontiers in Neuroscience
Frontiers in Integrative Neuroscience
Frontiers in Psychology
Neuropsychologia
Journal of Cognitive Neuroscience
eNeuro
iScience
Multisensory Perception

Associate Editor:

Frontiers in Integrative Neuroscience

Funding Agency Reviewer:

NIH: Cognitive Processing (Ad hoc, 06/2011)

NIH: Cognitive Processing (Ad hoc, 06/2013)

NIH: Sensory, Perception, and Cognition (Ad hoc, 06/2018)

NIH: SPC Fellowships F02-B (2017-Present)

NIH: BRAIN Initiatives (2022-Present)

The Netherlands Organisation for Scientific Research (NWO)

NSF

Section Editor:

The New Handbook of Multisensory Processing
Frontiers in Integrative Neuroscience (2012-Present)

PROFESSIONAL MEMBERSHIPS:

2015-Present	Cognitive Neurosciences Society (CNS)
2014-Present	Vision Science Society (VSS)
2010-Present	Association for Research in Vision and Ophthalmology
2004-Present	Society for Neuroscience
2002-Present	Institute of Electrical and Electronics Engineers (IEEE)

HONORS AND AWARDS:

Faculty Awards

2015-2016	Teaching Award, Neuroscience Program, WFUSM
2017-2018	MS Mentor Award, Neuroscience Program, WFUSM
2017-2018	PhD Mentor Award, Neuroscience Program, WFUSM
2020-2021	Teaching Award, Neuroscience Program, WFUSM

Fellowships

2004-2007	Institutional Postdoctoral Training Fellowship, NIH 5T32-DC00057
2003	Travel Fellowship, Boston University, International Conference on Cognitive and Neural Systems

INVITED PRESENTATIONS AND SEMINARS

"Perturbation-Based Learning." ICS Colloquium Series, UL-Lafayette, 2002.

"A Mathematical Model of Novelty Detection." ICS Colloquium Series, UL-Lafayette, 2003.

"A Mathematical Model of Novelty Detection and Episodic Memory Based on the Mammalian Hippocampus." ICS Colloquium Series, UL-Lafayette, 2004.

"Tutorial: Multisensory Integration as Bayesian Inference." Multisensory Research Group, Wake Forest School of Medicine, 2004.

"Tutorial: Applications of the Fourier Transform in Neuroscience." Multisensory Research Group, Wake Forest School of Medicine, 2005.

“Multisensory Integration in The Superior Colliculus: Inside the Black Box.” 9th Meeting of the International Multisensory Research Forum, Hamburg, Germany, 2008.

“Long-term Plasticity in SC Multisensory Integration: the Acquisition of Multisensory Integration Capabilities During Adulthood.” 10th Meeting of the International Multisensory Research Forum. New York, NY, 2009.

"Modeling the temporal profile of multisensory integration." 12th Meeting of the International Multisensory Research Forum. Fukuoka, JP, 2011.

"The midbrain circuit mediating the development and plasticity of multisensory integration." 15th Meeting of the International Multisensory Research Forum. Amsterdam, NL, 2014.

RESEARCH INTERESTS:

Research Focus

- Temporal dynamics of multisensory integration in physiology and behavior
- Anatomical, physiological, and experiential dependencies of its development
- Computational modeling of integration at the cellular and behavioral levels
- Translational applications of multisensory integration

GRANTS:

ONGOING

EY031532 (Rowland/Stein PIs)
Multisensory Development: Cortical-Midbrain Interactions 07/01/20-06/30/24
The major goal of this project is to determine how multisensory integration in the midbrain develops through interactions with the cortex.
Role: co-P.I.

COMPLETED (within the last 3 years)

Pilot Award (Rowland PI) 06/01/21-05/31/22
Clinical and Translational Science Institute
Preserving visual function with neuro-protective agents
The goal of this project is to examine the visual capabilities of the brain after extensive damage to visual cortex, and to evaluate the efficacy of using neuro-protective agents before or after a lesion to preserve visual function.
Role: PI

Pilot Award (Rowland PI) 06/01/21-05/31/22
Neuroscience Clinical Trial and Innovation Center
Multisensory Rehabilitation of Hemianopia
The goal of this project is to evaluate a noninvasive multisensory training paradigm for the restoration of visual function in hemianopic patients.
Role: PI

EY026916 (Rowland/Stein PIs) 08/01/16-07/31/21
NIH/NEI
Reversing Hemianopia with Cross-Modal Training
The major goal of this project is to use a new cross-modal training program to ameliorate the effects of lesion-induced hemianopia, and to understand the neural bases for this effect.
Role: co-P.I.

EY024458 (Stein PI) 03/01/15-02/28/19
NIH/NEI
Development of Multisensory Integration
The major goals of this project are to determine the maturational changes in the cortical-subcortical pathways critical for the genesis of multisensory processes and the multisensory behaviors mediated by SC circuits.
Role: Co-I.

Foundation Grant (Rowland PI) 01/01/15-12/31/18
Wallace Foundation
Developmental Dysfunctions in Multisensory Integration and Rehabilitation Strategies: Issues Relevant to Sensory Processing
The purpose of this grant is to better understand the physiological bases of a signature dysfunction in SPD (the developmental disruption of multisensory integration capabilities) in order to develop effective rehabilitative strategies. This will be accomplished by using single neuron analysis in the developing midbrain and cortex of an animal model, and detailing the relative plasticity of their underlying circuits.
Role: PI

EY016716 – (Stein/Rowland PIs) 02/01/12-01/31/17
NEI
Processing Visual and Multisensory Information
The major goal of this grant is to examine the computational strategies used by the brain to integrate information within and across modalities, and to understand the evolutionary significance of instantiating such different computation operations.
Role: co-PI

1T32 NS 73553 (Stein PI) 07/01/11-06/30/21
NIH
Training Program in Multisensory Processes
Role: Executive Committee

BIBLIOGRAPHY:

Peer Reviewed Journal Articles: * *indicates trainee under my supervision*

1. **Rowland, B.A.**, Maida, A.S., and Berkeley, I.S.N. (2006). Synaptic noise as a means of implementing weight-perturbation learning. Connection Science, 18(1): 69-79.

2. **Rowland, B.A.**, Quessy, S., Stanford, T.R., and Stein, B.E. (2007). Multisensory integration shortens physiological response latencies. Journal of Neuroscience, 27: 5879-5884.

3. **Rowland, B.**, Stanford, T., and Stein, B. (2007). A Bayesian model unifies multisensory spatial localization with the physiological properties of the superior colliculus. Experimental Brain Research, 180: 153–161.

4. Jiang, W., Jiang, H., **Rowland, B.A.**, and Stein, B.E. (2007). Multisensory orientation behavior is disrupted by neonatal cortical ablation. Journal of Neurophysiology, 97(1): 557-562.

5. **Rowland, B.A.**, Stanford, T.R., and Stein, B.E. (2007). A model of the neural mechanisms underlying multisensory integration in the superior colliculus. Journal of Perception [Special Issue on Multisensory Integration] 36: 1431-1443.

6. **Rowland, B.A.** and Stein, B.E. (2007). Multisensory integration produces an initial response enhancement. Frontiers in Integrative Neuroscience 1(4): 1-8.

7. Alvarado, J.C., **Rowland, B.A.**, Stanford, T.R., Stein, B.E. (2008). A neural network model of multisensory integration also accounts for unisensory integration in superior colliculus. Brain Research [Special Issue on Multisensory Integration] 1242: 13-23.

8. **Rowland, B.A.** and Stein, B.E. (2008). Temporal profiles of response enhancement in

multisensory integration. Frontiers in Neuroscience 2(2): 218-224.

9. Gingras, G., **Rowland, B.A.**, and Stein, B.E. (2009). The differing impact of multisensory and unisensory integration on behavior. Journal of Neuroscience 29(15): 4897-4902.

10. Alvarado, J.C., Stanford, T.R., **Rowland, B.A.**, Vaughan, J.W., and Stein, B.E. (2009). Multisensory integration in the superior colliculus requires synergy among corticocollicular inputs. Journal of Neuroscience 29(20): 6580-6592.

11. Stein, B.E., Stanford, T.R., Ramachandran, R., Perrault, Jr., T.J., and **Rowland, B.A.** (2009). Challenges in quantifying multisensory integration: Alternative criteria, models, and inverse effectiveness. Experimental Brain Research, 198: 113-126.

12. Stein, B.E., Stanford, T.R., and **Rowland, B.A.** (2009). The neural basis of multisensory integration in the midbrain: Its organization and maturation. Hearing Research 258(1-2): 4-15.

13. Stein, B.E., Perrault, Jr., T.J., Stanford, T.R., and **Rowland, B.A.** (2009). Postnatal experiences influence how the brain integrates information from different senses. Frontiers in Integrative Neuroscience [Invited Article] 3(21): 1-12.

14. * Yu, L., Stein, B.E., and **Rowland, B.A.** (2009). Adult plasticity in multisensory neurons: Short-term experience-dependent changes in the superior colliculus. Journal of Neuroscience 29(50): 15910-15922.

15. Cuppini, C., Ursino, M., Magosso, E., **Rowland, B.A.**, and Stein, B.E. (2010). An emergent model of multisensory integration in superior colliculus neurons. Frontiers in Integrative Neuroscience 4(6): 1-15.

16. * Yu, L., **Rowland, B.A.**, and Stein, B.E. (2010). Initiating the development of multisensory integration by manipulating sensory experience. Journal of Neuroscience 30(14): 4904-4913.

17. Stein, B.E., Burr, D., Constantinidis, C., Laurienti, P.J., Meredith, M.A., Perrault, Jr., T.J., Ramachandran, R., Röder, B., **Rowland, B.A.**, Sathian, K., Schroeder, C.E., Shams, L., Stanford, T.R., Wallace, M.T., * Yu , L., and Lewkowicz, D.J. (2010). Semantic confusion regarding the development of multisensory integration: A practical solution. European Journal of Neuroscience 31: 1713-1720.

18. Perrault, Jr., T.J., Stein, B.E., and **Rowland, B.A.** (2011). Non-stationarity in multisensory neurons in the superior colliculus. Frontiers in Psychology 2(144): 1-6.

19. Stein, B.E. and **Rowland, B.A.** (2011). Organization and plasticity in multisensory integration: Early and late experience affects its governing principles. Progress in Brain Research 191: 145-163.

20. Cuppini, C., Stein, B.E., **Rowland, B.A.**, Magosso, E., and Ursino, M. (2011). A computational study of multisensory maturation in the superior colliculus (SC). Experimental Brain Research 213(2-3): 341-349.

21. Pluta, S.R., **Rowland, B.A.**, Stanford, T.R., and Stein, B.E. (2011). Alterations to multisensory and unisensory integration by stimulus competition. Journal of Neurophysiology 106(6): 3091-3101.

22. * Xu, J., * Yu, L., **Rowland, B.A.**, Stanford, T.R., and Stein, B.E. (2012). Incorporating cross-modal statistics in the development and maintenance of multisensory integration. Journal of Neuroscience 32(7): 2287-2298.

23. Cuppini, C., Magosso, E., **Rowland, B.**, Stein, B., and Ursino, M. (2012). Hebbian mechanisms help explain development of multisensory integration in the superior colliculus: a neural network model. Biological Cybernetics 106: 691-713.

24. * Yu, L., **Rowland, B.A.**, * Xu, J., and Stein, B.E. (2013). Multisensory plasticity in adulthood: Cross-modal experience enhances neuronal excitability and exposes silent inputs. Journal of Neurophysiology 109: 464-474.

25. * Yu, L., * Xu, J., **Rowland, B.A.**, and Stein, B.E. (2013). Development of cortical influences on superior colliculus multisensory neurons: effects of dark-rearing. European Journal of Neuroscience. 37(10): 1594-1601.

26. **Rowland, B.A.** and Stein, B.E. (2014). A model of the temporal dynamics of multisensory enhancement. Neuroscience & Biobehavioral Reviews 41C: 78-84.

27. * Xu, J., * Yu, L., **Rowland, B.A.**, Stanford, T.R., and Stein, B.E. (2014). Noise-rearing disrupts the maturation of multisensory integration. European Journal of Neuroscience. 39(4): 602-613.

28. **Rowland, B.A.**, Jiang W., and Stein, B.E. (2014). Brief cortical deactivation early in life has long-lasting effects on multisensory behavior. Journal of Neuroscience 34(21): 7198-7202.

29. Stein, B.E., Stanford, T.R., and **Rowland, B.A.** (2014). Development of multisensory integration from the perspective of the individual neuron. Nature Reviews Neuroscience 15: 520-535.

30. * Xu, J., * Yu, L., Stanford, T.R., **Rowland, B.A.**, and Stein, B.E**.** (2015). What does a neuron learn from multisensory experience? Journal of Neurophysiology 113(3): 883-889.

31. Hanganu-Opatz, I.L., **Rowland, B.A.**, Bieler, M., and Sieben, K. (2015). Unravelling cross-modal development in animals: neural substrate, functional coding and behavioral readout. Multisensory Research 28(1-2): 33-69.

32. * Miller, R.L., Pluta, S.R., Stein, B.E., and **Rowland, B.A.** (2015). Relative unisensory strength and timing predict their multisensory product. Journal of Neuroscience 35(13): 5213-5220.

33. * Yu, L., * Xu, J., **Rowland, B.A.**, and Stein, B.E. (2016). Multisensory plasticity in superior colliculus neurons is mediated by association cortex. Cerebral Cortex 26(3): 1130-1137.

34. * Miller, RL, Stein, BE, **Rowland, BA** (2017). Multisensory Integration Uses a Real-Time Unisensory-Multisensory Transform. J Neurosci. 37(20):5183-5194.

35. * Xu J, * Yu L, **Rowland BA**, Stein BE (2017) The normal environment delays the development of multisensory integration. Sci Rep 7:4772.

36. * Bach, EC, Vaughan, JW, Stein, BE, **Rowland, BA** (2018). Pulsed Stimuli Elicit More Robust Multisensory Enhancement than Expected. Front. Integr. Neurosci. 11:40.

37. Cuppini C, Stein BE, **Rowland BA** (2018) Development of the Mechanisms Governing Midbrain Multisensory Integration. J Neurosci 38:3453–3465.

38. * Yu L, Cuppini C, * Xu J, **Rowland BA,** Stein BE (2019) Cross-Modal Competition: The Default Computation for Multisensory Processing. J Neurosci 39:1374–1385.

39. * Dakos AS, * Walker EM, Jiang H, Stein BE, **Rowland BA** (2019) Interhemispheric visual competition after multisensory reversal of hemianopia. Eur J Neurosci 50:3702–3712.

40. * Dakos AS, Jiang H, Stein BE, **Rowland BA** (2020) Using the Principles of Multisensory Integration to Reverse Hemianopia. Cereb Cortex 30:2030–2041.

41. Jiang H, **Rowland BA**, Stein BE (2020) Reversing Hemianopia by Multisensory Training Under Anesthesia. Front Syst Neurosci 14:4.

42. Stein BE, **Rowland BA** (2020) Using superior colliculus principles of multisensory integration to reverse hemianopia. Neuropsychologia 141:107413.

43. Stein BE, Stanford TR, **Rowland BA** (2020) Multisensory Integration and the Society for Neuroscience: Then and Now. J Neurosci 40:3–11.

44. * Wang Z, * Yu L, * Xu J, Stein BE, **Rowland BA** (2020). Experience creates the multisensory transform in the superior colliculus. Frontiers in Integrative Neuroscience 14, 18

45. Stein BE, **Rowland BA** (2020). Neural development of multisensory integration. Multisensory Perception, 57-87

46. * Bean NL, Stein BE, **Rowland BA** (2021) Stimulus value gates multisensory integration. Eur J Neurosci 53:3142–3159.

47. * Smyre SA, * Wang Z, Stein BE, **Rowland BA** (2021) Multisensory Enhancement of Overt Behavior Requires Multisensory Experience. Eur J Neurosci. In press.

48. * Bean NL, *Smyre SA, Stein BE, **Rowland BA** (2022) Nose-rearing precludes the behavioral benefits of multisensory integration. Cerebral Cortex. In press.

49. Triplett JW, **Rowland BA**, Reber M (2022) Editorial: Development and plasticity of multisensory circuits. Front Neural Circuits. In press

50. **Rowland BA**, Bushnell CD, Duncan PW, Stein BE (2023) Ameliorating Hemianopia with Multisensory Training. J Neurosci. In press.

51. Smyre SA, Bean NL, Stein, BE, **Rowland BA** (2023) Predictability alters multisensory responses by modulating unisensory inputs. Frontiers in Neuroscience. In press.

Chapters:

1. Stein, B.E., **Rowland, B.**, Laurienti, P., and Stanford, T.R. (2009). Multisensory convergence and integration. In: "Encyclopedia of Neuroscience," (R. Krauzlis, ed.), Elsevier, vol. 5, pp. 1119-1124.

2. Stein, B.E., Perrault, T. Jr., Stanford, T.R., and **Rowland, B.A.** (2011). The developmental process of acquiring multisensory integration capabilities: In: Cerebral Plasticity: New Perspectives, L.M. Chalupa, N. Berardi, M. Caleo, L. Galli-Resta, T. Pizzorusso (eds.), MIT Press, Cambridge, MA, pp. 179-199.

3. **Rowland, B.A.**, Stein, B.E., and Stanford, T.R. (2011). Computational models of multisensory integration in the cat superior colliculus. In: Sensory Cue Integration, J. Trommershauser, K. Kording, and M.S. Landy (ed.), Oxford University Press, pp. 333-344.

4. Perrault, T.J. Jr., and **Rowland, B.A.** (2012). Fundamental properties underlying multisensory integration in the superior colliculus. In: The New Handbook of Multisensory Processing, B.E. Stein (ed.), MIT Press, Cambridge, MA, pp. 103-114.

5. **Rowland, B.A.** (2012). Computational models of multisensory integration: Bayesian frameworks, development, and timing [Commentary]. In: The New Handbook of Multisensory Processing, B.E. Stein (ed.), MIT Press, Cambridge, MA, pp. 511-514.

6. Perrault, T.J., **Rowland, B.A.**, and Stein, B.E. (2012). The organization and plasticity of

multisensory integration in the midbrain: In: The Neural Bases of Multisensory Processes, M. M. Murray and M.T. Wallace (eds), CRS Press, Boca Raton, FL, pp. 279-300.

7. **Rowland, B.A.**, Stein, B.E., and Stanford, T.R. (2015). Multisensory Integration. In: International Encyclopedia of the Social and Behavioral Sciences, J.L. McClelland and R. Thompson (eds.) Elsevier, pp. 94-102.

8. * Miller, R.L. and **Rowland, B.A.** (2017). Multisensory integration: How the brain combines information across the senses. In: Computational Models of Brain and Behavior. A.A. Moustafa (ed.) Wiley-Blackwell, pp. 215-228.

9. Stein, B.E., Stanford, T.S., and **Rowland, B.A.** (2020). Development of the Superior Colliculus/Optic Tectum. In: Neural Circuit and Cognitive Development. J. Rubenstein, P. Rakic, B. Chen, K. Kwan (eds.) Elsevier.

10. Stein, B.E. and **Rowland, B.A.** (2020). Neural development of multisensory integration. In: Sathian K and Ramachandran VS, (eds). Multisensory Perception: From Laboratory to Clinic. San Diego: Elsevier, pp. 57-87.

Reviews and Commentaries:

1. **Rowland, B.A.** Multisensory development, edited by AJ Bremner, DJ Lewkowicz, C Spence [book review]. Perception. 2013; 42(8):898-899.

2. **Rowland, B.A.** An effect of multisensory training on visual processing (Commentary on Grasso et al. (2016)). Eur J Neurosci. 2016 Nov; 44(10):2746-2747

Abstracts: * *indicates trainee under my supervision*

1. Maida, A.S., Gunay, C., and **Rowland, B.A.** (2001). Simulation of planar I/F networks with delayed connections. Proceedings of the International Joint INNS-IEEE Conference on Neural Networks (Washington, D.C.).

2. Maida, A.S. and **Rowland, B.A.** (2001). Synchronized firing in a time-delayed neural network. Proceedings of the Florida Artificial Intelligence Research Symposium (Miami Beach, FL).

3. Maida, A.S., **Rowland, B.A.**, and Gunay, C. (2001). Simulations of planar integrate-and-fire networks with delays and refractory periods. Proceedings of the 5th International Conference on Cognitive and Neural Systems (Boston, MA).

4. **Rowland, B.A.** and Maida, A.S. (2003). The temporal segmentation capacity of integrate and fire networks with transmission delays. Proceedings of the 7th Annual International Conference on Cognitive and Neural Systems (Boston, MA).

5. **Rowland, B.A.** and Maida, A.S. (2004). Spatiotemporal novelty detection using resonance networks. Proceedings of the Florida Artificial Intelligence Research Symposium (Miami Beach, FL).

6. Stein, B.E., **Rowland, B.A.**, and Stanford, T.R. (2005). Multisensory enhancement to spatially disparate peripheral stimuli: a bayesian explanation. Society for Neuroscience Abstracts (Washington, D.C.) 31: 505.6.

7. Stanford, T., **Rowland, B.**, and Stein, B. (2005). Modeling the biophysical basis of multisensory integration in the superior colliculus. 6th Annual Meeting of the International Multisensory Research Forum (Trento, Italy) p. 17.

8. **Rowland, B.A.**, Jiang, W., and Stein, B.E. (2005). Long-term plasticity in multisensory integration. Society for Neuroscience Abstracts (Washington, D.C.) 31: 505.8.

9. Gingras, G., **Rowland, B.A.**, and Stein, B.E. (2006). Behavioral assessment of unisensory and multisensory integration. (Vision Sciences Society, Sarasota, FL) Journal of Vision 6(6): 184a.

10. Gingras, G., **Rowland, B.A.**, and Stein, B.E. (2006). The difference between within-modal and cross-modal integration: A Bayesian explanation. Association for Research in Vision and Ophthalmology Abstract (Fort Lauderdale, FL) Investigative Ophthalmology and Visual Science 47: 3686.

11. Gingras, G., **Rowland, B.A.**, and Stein, B.E. (2006). Unisensory versus multisensory integration: Computational distinctions in behavior. Society for Neuroscience Abstracts (Atlanta, GA) 32: 639.6.

12. **Rowland, B.A.**, Stanford, T.R., and Stein, B.E. (2006). Computational modeling of multisensory neurons in the superior colliculus. Society for Neuroscience Abstracts (Atlanta, GA) 32: 639.8.

13. **Rowland, B.**, Stanford, T.R., Quessy, S., and Stein, B.E. (2006). Timing: a critical factor in multisensory integration. 7th Annual Meeting of the Multisensory Research Forum (Dublin, Ireland) p. 44.

14. **Rowland, B.A.**, Jiang, W., and Stein, B.E. (2007). Cortical afferents of the superior colliculus guide the development of multisensory integration in visual localization. (Association for Research in Vision and Ophthalmology Abstract, Fort Lauderdale, FL) Investigative Ophthalmology and Visual Science 48: 3763.

15. **Rowland, B.A.**, Stanford, T.R., and Stein, B.E (2007). Superior colliculus neurons may use multiple strategies in integrating cross-modal cues. Society for Neuroscience Abstracts (San Diego, CA) 33: 614.1.

16. Gingras, G., **Rowland, B.A.**, and Stein, B.E (2007). The impact of dark rearing on learning a lateralization task using stimuli of different modalities. Society for Neuroscience Abstracts (San Diego, CA) 33: 614.4.

17. Stein, B.E. and **Rowland, B.A.** (2007). The critical role of cortico-collicular interactions in the development of multisensory integration. Society for Neuroscience Abstracts (San Diego, CA) 33: 614.7.

18. Cuppini, C., Ursino, M., Magosso, E., **Rowland, B.A.**, and Stein, B.E. (2008). A neural network model of multisensory maturation in superior colliculus neurons. Society for Neuroscience Abstracts (Washington, DC) 34: 457.5.

19. **Rowland, B.A.**, Perrault, Jr., T.J., Vaughan, J.W., and Stein, B.E. (2008). Multisensory integration in complex scenes: theoretical foundations. Society for Neuroscience Abstracts (Washington, DC) 34: 457.7.

20. Perrault, T.J., Stein, B.E., Vaughan, J.W., and **Rowland, B.A.** (2008). Multisensory integration in complex scenes: empirical observations. Society for Neuroscience Abstracts (Washington, DC) 34: 457.12.

21. Stein, B.E., Perrault, Jr., T.J., Vaughan, J.W., and **Rowland, B.A.** (2008). Long term plasticity of multisensory neurons in the superior colliculus. Society for Neuroscience Abstracts (Washington, DC) 34: 457.14.

22. **Rowland, B.A.** (2008). Multisensory integration in the superior colliculus: Inside the black box. 9th Meeting of the International Multisensory Research Forum (Hamburg, Germany).

23. Bertini, C., Passamonti, C., **Rowland, B.**, and Stein, B. (2009). Multisensory disambiguation of a temporal pattern. 10th Meeting of the International Multisensory Research Forum, New York, NY.

24. Cuppini, C., Ursino, M., Magosso, E., **Rowland, B.**, and Stein, B. (2009). Multisensory integration in superior colliculus (SC) neurons: a computational study. 10th Meeting of the International Multisensory Research Forum (New York, NY).

25. **Rowland, B.A.** (2009). Long-term plasticity in sc multisensory integration: the acquisition of multisensory integration capabilities during adulthood. 10th Meeting of the International Multisensory Research Forum (New York, NY).

26. **Rowland, B.A.**, Perrault, T.J. Jr., and Stein, B.E. (2009). Temporal profiles of multisensory integration in the adult superior colliculus: Asynchronous stimuli. Society for Neuroscience Abstracts (Chicago, IL) 35: 847.1.

27. Perrault, T.J. Jr., **Rowland, B.A.**, and Stein, B.E. (2009). Plasticity of multisensory neurons in adult superior colliculus: Changes resulting from randomly interleaved unisensory and multisensory stimuli. Society for Neuroscience Abstracts (Chicago, IL) 35: 847.2.

28. * Yu, L., **Rowland, B.A.**, and Stein, B.E. (2009). Plasticity of multisensory neurons in adult superior colliculus: Effects of repeated sequential visual and auditory stimuli. Society for Neuroscience Abstracts (Chicago, IL) 35: 847.3.

29. Stein, B.E., * Yu, L., and **Rowland, B.A.** (2009). Plasticity of superior colliculus neurons: Late acquisition of multisensory integration. Society for Neuroscience Abstracts (Chicago, IL) 35: 847.4.

30. Stein, B.E., Perrault, T.J. Jr., Vaughan, J.W., and **Rowland, B.A.** (2009). Visual-auditory (multisensory) plasticity in adult superior colliculus neurons. Association for Research in Vision and Ophthalmology Abstract (Fort Lauderdale, FL) #1432.

31. Cuppini, C., Stein, B.E., **Rowland, B.A.**, Magosso, E., and Ursino, M. (2010). A computational study of multisensory maturation in the superior colliculus (SC). 11th Meeting of the International Multisensory Research Forum (Liverpool, UK) p. 72-73, #118.

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