

RACHEL A. DIANA

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890 Drillfield Dr.
Virginia Polytechnic and State University
Blacksburg, VA 24060

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PROFESSIONAL EXPERIENCE:

- 2018-present Associate Professor, Dept. of Psychology, Virginia Polytechnic Institute and State University
- 2011-2018 Assistant Professor, Dept. of Psychology, Virginia Polytechnic Institute and State University
- 2006-2011 Post-doctoral Researcher, Center for Neuroscience and Dept. of Psychology, University of California, Davis
Advisors: Charan Ranganath & Andrew P. Yonelinas

EDUCATION:

- 2001-2006 Ph.D. in Psychology, Carnegie Mellon University
Advisor: Lynne M. Reder
Dissertation: The low frequency encoding disadvantage: Reconciling word frequency effects in memory by considering processing demands at encoding
- 2002 M.S. in Psychology, Carnegie Mellon University
- 1997-2001 B.S. in Psychology with Honors, *summa cum laude*, Presbyterian College
Advisor: Leslie L. Baylis

CURRENT RESEARCH SUPPORT:

- 2019-2024 NSF
Context resolution and variability: Identifying learning strategies to optimize hippocampal representations
PI: Rachel A. Diana
Total direct costs: \$375,207
- 2019-2021 National Institute of Child Health and Human Development, R21
Brain electrical activity during infant inhibitory control
MPIs: Martha Ann Bell & Rachel A. Diana
Total direct costs: \$275,000

PAST RESEARCH SUPPORT:

- 2009-2015 K99/R00 Pathway to Independence Award (NIMH)
The dynamics of item and context memory in the medial temporal lobe
PI: Rachel A. Diana
Total direct costs: \$740,009
- 2007-2009 National Research Service Award (NIMH)
- 2002-2005 National Science Foundation Graduate Research Fellowship

PEER-REVIEWED PUBLICATIONS:

- Lim, Y., Lang, D.J., & Diana, R.A. (2023). Cognitive tasks affect the relationship between representational pattern similarity and subsequent item memory in the hippocampus. *NeuroImage*, 277, doi: 10.1016/j.neuroimage.2023.120241
- Salan, J., Smith, D.E. & Diana, R.A. (under revision). Variation in encoding context benefits item memory.
- Tu, H.W. & Diana, R.A. (2021). The interaction of relational encoding and unitization: Effects on medial temporal lobe processing during retrieval. *Behavioural Brain Research*, 396, doi: 10.1016/j.bbr.2020.112878.
- Hill, P.F., Yi, R., Spreng, R.N., & Diana, R.A. (2017). Neural congruence between intertemporal and interpersonal self-control: Evidence from delay and social discounting, *NeuroImage*, 162, 186-198.
- Wang, F. & Diana, R.A. (2017). Temporal context in human fMRI. *Current Opinion in Behavioral Sciences*, 17, 57-64. doi: 10.1016/j.cobeha.2017.06.004
- Tu, H-W., Alty, E.E., & Diana, R.A. (2017). Event-related Potentials during Encoding: Comparing Unitization to Relational Processing, *Brain Research*, 1667, 46-54. doi: 10.1016/j.brainres.2017.05.003.
- O'Neill, M. & Diana, R.A. (2017). The neurocognitive basis of borrowed context information. *Cortex*, 91, 89-100. doi: 10.1016/j.cortex.2017.01.014.
- Beauchene, C., Abaid, N., Moran, R., Diana, Rachel A., & Leonessa, A. (2017). The effect of binaural beats on verbal working memory and cortical connectivity. *Journal of Neural Engineering*, 14. doi: 10.1088/1741-2552/aa5d67.
- Wang, F. & Diana, R.A. (2017). Neural correlates of temporal context retrieval for abstract scrambled phrases: Reducing narrative and familiarity-based strategies. *Brain Research*, 1655, 128-137. doi: 10.1016/j.brainres.2016.11.017. PubMed PMID: 27867032; PubMed Central PMCID: PMC5221767.
- Diana, R.A. (2017). Parahippocampal cortex processes the nonspatial context of an event. *Cerebral Cortex*, 27, 1808-1816. doi: 10.1093/cercor/bhw014. PubMed PMID: 26874181.

- Beauchene, C., Abaid, N., Moran, R., Diana, R.A., & Leonessa, A. (2016). The effect of binaural beats on visuospatial working memory and cortical connectivity, *PLOS One*, *11*, e0166630. doi:10.1371/journal.pone.0166630. PubMed PMID: 27893766.
- Blankenship, T., O'Neill, M., Deater-Deckard, K., Diana, R.A., & Bell, M.A. (2016). Frontotemporal functional connectivity and executive functions contribute to episodic memory performance. *International Journal of Psychophysiology*, *107*, 72-82. doi: 10.1016/j.ijpsycho.2016.06.014. PubMed PMID: 27388478; PubMed Central PMCID: PMC4986699.
- Wang, F. & Diana, R.A. (2016). Temporal context processing within hippocampal subfields. *NeuroImage*, *134*, 261–269. doi: 10.1016/j.neuroimage.2016.03.048. PubMed PMID: 27039142; PubMed Central PMCID: PMC4912848.
- Tu, H-W. & Diana, R.A. (2016). Two Are Not Better Than One: Combining Unitization and Relational Encoding Strategies. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *42*, 114-126. doi: 10.1037/xlm0000170. PubMed PMID: 26237616; PubMed Central PMCID: PMC4710559.
- Bastin, C., Bahri, M.A., Collette, F., Genon, S., Simon, J., Guillaume, B., Diana, R.A., Yonelinas, A.P., & Salmon, E. (2014). Associative memory and its cerebral correlates in Alzheimer's disease: Evidence for distinct deficits of relational and conjunctive memory. *Neuropsychologia*, *63*, 99-106. doi: 10.1016/j.neuropsychologia.2014.08.023. PubMed PMID: 25172390; PubMed Central PMCID: PMC4194129.
- Diana, R.A., Yonelinas, A.P., Ranganath, C. (2013). Parahippocampal cortex activation during context reinstatement predicts item recollection. *Journal of Experimental Psychology: General*, *142*, 1287-97. doi: 10.1037/a0034029. PubMed PMID: 23937182. PubMed Central PMCID: PMC3939693.
- Bastin, C., Diana, R.A., Simon, J., Collette, F., Yonelinas, A.P., & Salmon, E. (2013) Associative memory in aging: The effect of unitization on source memory. *Psychology and Aging*, *28*, 275-283. doi: 10.1037/a0031566. PubMed PMID: 23527745; PubMed Central PMCID: PMC3760335.
- Diana, R.A., Yonelinas, A.P., & Ranganath, C. (2012). Adaptation to cognitive context and item information in the medial temporal lobes. *Neuropsychologia*, *50*, 3062-9. doi: 10.1016/j.neuropsychologia.2012.07.035. PubMed PMID: 22846335; PubMed Central PMCID: PMC3483447.
- Diana, R.A., Van den Boom, W., Yonelinas, A.P., & Ranganath, C. (2011). ERP correlates of source memory: Unitized source information increases familiarity-based retrieval. *Brain Research*, *1367*, 278-86. doi: 10.1016/j.brainres.2010.10.030. PubMed PMID: 20965154; PubMed Central PMCID: PMC3095515.
- Diana, R.A., Yonelinas, A.P., & Ranganath, C. (2010). Medial temporal lobe activity during source retrieval reflects information type, not memory strength. *Journal of Cognitive Neuroscience*, *22*, 1808-18. doi: 10.1162/jocn.2009.21335. PubMed PMID: 19702458; PubMed Central PMCID: PMC2862119.

- Diana, R.A., Yonelinas, A.P., & Ranganath, C. (2008). The effects of unitization on familiarity-based source memory: Testing a behavioral prediction derived from neuroimaging data. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, *34*, 730-740. doi: 10.1037/0278-7393.34.4.730. PubMed PMID: 18605864; PubMed Central PMCID: PMC2605011.
- Diana, R.A., Yonelinas, A.P., & Ranganath, C. (2008). High-resolution multi-voxel pattern analysis of category selectivity in the medial temporal lobes. *Hippocampus*, *18*, 536-541. doi: 10.1002/hipo.20433. PubMed PMID: 18446830; PubMed Central PMCID: PMC2398650.
- Diana, R.A., Yonelinas, A.P., & Ranganath, C. (2007). Imaging recollection and familiarity in the medial temporal lobe: A three-component model. *Trends in Cognitive Sciences*, *11*, 379-386. doi: 10.1016/j.tics.2007.08.001. PubMed PMID: 17707683.
- Diana, R.A. & Reder, L.M. (2006). The low frequency encoding disadvantage: Word frequency affects processing demands. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, *32*, 805-815. PubMed PMID: 16822148; PubMed Central PMCID: PMC2387211.
- Diana, R.A., Reder, L.M., Arndt, J., & Park, H. (2006). Models of recognition: A review of arguments in favor of a dual-process account. *Psychonomic Bulletin & Review*, *13*, 1-21. PubMed PMID: 16724763; PubMed Central PMCID: PMC2387212.
- Diana, R.A. & Reder, L.M. (2005). The List Strength Effect: A contextual competition account. *Memory & Cognition*, *33*, 1289-1302. PubMed PMID: 16532860; PubMed Central PMCID: PMC2387209.
- Diana, R.A., Vilberg, K.L., & Reder, L.M. (2005). Identifying the ERP correlate of a recognition memory search attempt. *Cognitive Brain Research*, *24*, 674-684. PubMed PMID: 15885990; PubMed Central PMCID: PMC2387216.
- Diana, R.A., Peterson, M.J., & Reder, L.M. (2004). The role of spurious feature familiarity in recognition memory. *Psychonomic Bulletin & Review*, *11*, 150-156. PubMed PMID: 15117001; PubMed Central PMCID: PMC1361528.

OTHER PUBLICATIONS:

- Diana, R. A., & Wang, F. (2018). Episodic Memory. In Wixted, J.T. (Series Ed.), Phelps, E. A. & Davachi, L. (Vol. Eds.), *Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience* (Vol. 1, pp. 67–100). doi: 10.1002/9781119170174.epcn103
- Mann, J., Polys, N., Diana, R.A., Ananth, M., Herald, B., & Platel, S. (2017) *Virginia tech's study hall: A virtual method of loci mnemotechnic study using a neurologically-based, mechanism-driven, approach to immersive learning research*, Paper presented at the IEEE Conference on Virtual Reality (VR). doi:10.1109/VR.2017.7892337
- Diana, R.A. & Ranganath, C. (2012). Neural basis of recollection: Evidence from neuroimaging and electrophysiological research. In S. Ghetti & P.J. Bauer (Eds), *Origins and development of recollection: Perspectives from psychology and neuroscience* (pp. 168-187). New York: Oxford University Press.

Diana, R.A. & Ranganath, C. (2011). Recollection, familiarity, and memory strength: Confusion about confounds. *Trends in Cognitive Sciences*, 15, 338-339.

Reder, L.M., Paynter, C., Diana, R.A., Ngiam, J., & Dickison, D. (2008). Experience is a double-edged sword: A computational model of the encoding/retrieval tradeoff with familiarity. In A.S. Benjamin & B. Ross (Eds.), *The Psychology of Learning and Motivation: Vol. 48. Skill and Strategy in Memory Use* (pp. 217-306). London: Elsevier.

Diana, R.A. & Reder, L.M. (2004). Visual and verbal metacognition: Are they really different? In D.T. Levin (Ed.), *Thinking and Seeing: Visual Metacognition in Adults and Children* (pp. 187-201). Cambridge, MA: MIT Press.

CONFERENCE AND INVITED TALKS:

University of Wisconsin, Milwaukee, Psychology Dept., January 2020, Milwaukee, WI
How does episodic context contribute to learning?

Lawrence University, Neuroscience Program, November 2019, Appleton, WI
Leveraging episodic memory principles to support learning

Memory Disorders Research Society Meeting, October 2019, New York, NY
Variation in encoding contexts increases item memory
Co-author: Jefferson Salan

Adaptive Brain & Behavior Destination Area workshop keynote, Virginia Tech, April 2018, *Unitizing Episodic Memory: From cognition to brain and back*

Memory Disorders Research Society Meeting, September 2017, Chicago, IL
ERP correlates differentiating unitization and relational processing during encoding
Co-author: Hsiao-Wei Tu

Memory Disorders Research Society Meeting, September 2016, Princeton, NJ
Relating theories of contextual memory to PTSD
Symposium organizer: PTSD as it informs memory research and vice-versa

Context and Episodic Memory Symposium, May 2016, Philadelphia, PA
Temporal context processing within hippocampal subfields
Co-author: Fang Wang

Society for Neuroscience, 45th Annual Meeting, October 2015, Chicago, IL
Temporal context processing within hippocampal subfields
Co-authors: Fang Wang, Kyle Woisard

Southeastern Psychological Association, 61st Annual Meeting, March 2015, Hilton Head, SC
Junior Keynote, Southeastern Workers in Memory symposium
The encoding and retrieval of context in episodic memory

Psychonomic Society, 53rd Annual Meeting, November 2012, Minneapolis, MN

Medial temporal lobe activation during cognitive context reinstatement
Co-authors: Andrew P. Yonelinas, Charan Ranganath

Memory Disorders Research Society Meeting, September 2012, Davis, CA
PHc activation during context reinstatement predicts recollection
Co-authors: Andrew P. Yonelinas, Charan Ranganath

Context and Episodic Memory Symposium, May 2012, Philadelphia, PA
Discussant commentary on Dr. David Donaldson's talk

University of Maryland, Department of Psychology, February 2011, College Park, MD
The medial temporal lobe's role in episodic memory: A theory based on information type

University of Kentucky, Department of Psychology, January 2011, Lexington, KY
The medial temporal lobe's role in episodic memory: A theory based on information type

Virginia Polytechnic Institute and State University, Department of Psychology, January 2011, Blacksburg, VA
The medial temporal lobe's role in episodic memory: A theory based on information type

University of Kansas, Department of Psychology, January 2011, Lawrence, KS
The medial temporal lobe's role in episodic memory: A theory based on information type

National Institutes of Health, Earl Stadtman Investigator Search, December 2010, Bethesda, MD
The medial temporal lobe's role in episodic memory: A theory based on information type

Oberlin College, Department of Neuroscience, December 2010, Oberlin, OH
The medial temporal lobe's role in episodic memory: A theory based on information type

Wayne State University, Department of Psychology, December 2010, Detroit, MI
The medial temporal lobe's role in episodic memory: A theory based on information type

State University of New York, Binghamton, Department of Psychology, December 2010, Binghamton, NY
The medial temporal lobe's role in episodic memory: A theory based on information type

Florida Atlantic University, Department of Psychology, November 2010, Boca Raton, FL
The medial temporal lobe's role in episodic memory: A theory based on information type

Society for Neuroscience, 40th Annual Meeting, Nov. 2010, San Diego, CA
Encoding item, context, and relational information: fMRI adaptation in the medial temporal lobes

Bay Area Memory Meeting, August 2010, Stanford, CA
Encoding item, context, and relational binding: fMRI adaptation in the medial temporal lobes

Brown University, Dept. of Psychology & Dept. of Cognitive/Linguistic Sciences, February 2009, Providence, RI
Testing an information-based theory of medial temporal lobe function

Johns Hopkins University, Dept. of Psychology, Dec., 2008, Baltimore, MD
Testing an information-based theory of medial temporal lobe function

Memory Disorders Research Society, Sept. 2008, Laird Cermak award talk, St. Louis, MO
Testing an information-based theory of medial temporal lobe function

Bay Area Memory Meeting, August 2008, Davis, CA
Source Memory: Unitized vs. Nonunitized encoding

Society for Neuroscience, 37th Annual Meeting, Nov. 2007, San Diego, CA
High resolution imaging in the medial temporal lobe: Using multi-voxel pattern analysis to examine the selectivity of subregions

UCD Imaging Research Center fMRI workshop, July 2007, Davis, CA
Multi-voxel pattern analysis

Bay Area Memory Meeting, August, 2006, Stanford, CA
The low frequency encoding disadvantage: Word frequency affects processing demands

CONFERENCE POSTER PRESENTATIONS:

Dennis Dean Undergraduate Research and Creative Scholarship Conference, April 2023, Virginia Tech
Is a Basis in Semantic Knowledge Required for Unitization of Item and Context Features in Episodic Memory?
Marali E. Harikar, Melissa S. Kramer, Shloka Adapa, Rebecca M. Fregoso, Elsa Fry, Sarah Green, & Rachel A. Diana

Cognitive Neuroscience Society Annual Meeting, 2021, Virtual
Does Unitization of an Item and Context Feature Require a Meaningful Association?
Ye-Lim Lim & Rachel A. Diana

Context and Episodic Memory Symposium, April 2018, University of Pennsylvania
Context variability as an encoding strategy
Jefferson Salan & Rachel A. Diana

Psychonomic Society, 58th Annual Meeting, November 2017, Vancouver, Canada
Predicting context: Priming for decision contingencies facilitates self-control
Paul F. Hill & Rachel A. Diana

Cognitive Neuroscience Society, 24th Annual Meeting, March 2017, San Francisco, CA
Functional dissociation and specialization of dentate gyrus and CA3 hippocampal subfields during episodic future thinking
Paul F. Hill, Tobias Sweeney, Gabriel A. Devenyi, Mallar Chakravarty, & Rachel A. Diana

Psychonomic Society, 57th Annual Meeting, November 2016, Boston, MA
Common and unique neural mechanisms supporting temporal and social discounting
Paul F. Hill, Amber Koch, & Rachel A. Diana

Virginia Tech Undergraduate Research Symposium & Creative Scholarship Conference, February 2016, Blacksburg, VA

Common and distinct neural pathways support self-controlled and altruistic decision making

Amber M. Koch, Paul F. Hill, & Rachel A. Diana

Cognitive Neuroscience Society, 22nd Annual Meeting, March 2015, San Francisco, CA

Source Memory Failures: Comparing Source Misattribution to Context of False Memories

Meagan O'Neill, Heather Lustig & Rachel A. Diana

Cognitive Neuroscience Society, 22nd Annual Meeting, March 2015, San Francisco, CA

A Dual-Task Investigation of the Component Processes Supporting Episodic Future Thinking

Paul F. Hill, Samantha T. Boothe, & Rachel A. Diana

Society for Neuroscience, 44th Annual Meeting, November 2014, Washington, D.C.

Dissociable neural correlates of unitization and relational association at encoding

Hsiao-Wei Tu, Vanessa Brayman, & Rachel A. Diana

Cognitive Neuroscience Society, 21st Annual Meeting, April 2014, Boston, MA

The interaction of unitization and relational encoding strategies on medial temporal lobe activation during retrieval

Hsiao-Wei Tu & Rachel A. Diana

Cognitive Neuroscience Society, 21st Annual Meeting, April 2014, Boston, MA

Future altruism: The effect of episodic future thought on interpersonal discounting

Paul F. Hill, Lauren Costello, & Rachel A. Diana

Cognitive Neuroscience Society, 21st Annual Meeting, April 2014, Boston, MA

Neural correlates of temporal context retrieval

Fang Wang & Rachel A. Diana

Society for Neuroscience, 43rd Annual Meeting, November 2013, San Diego, CA

Memory for nonspatial context in parahippocampal cortex

Rachel A. Diana, Roger Strong, & Ashley Fehr

Cognitive Neuroscience Society, 20th Annual Meeting, April 2013, San Francisco, CA

Distinct profiles of impaired associative memory and underlying cerebral networks in Alzheimer's disease

Bastin, C., Bahri, M. A., Collette, F., Genon, S., Simon, J., Guillaume, B., Diana, R.A., Yonelinas, A. P., & Salmon, E.

Cognitive Neuroscience Society, 20th Annual Meeting, April 2013, San Francisco, CA

Unitization of multiple context details in episodic memory

Hsiao-Wei Tu & Rachel A. Diana

Cognitive Neuroscience Society, 16th Annual Meeting, March 2009, San Francisco, CA

ERP correlates of source memory: Unitized source information increases familiarity-based retrieval

Rachel A. Diana, Wijnand Van den Boom, Andrew P. Yonelinas, & Charan Ranganath

Psychonomic Society, 49th Annual Meeting, November 2008, Chicago, IL

Different roles for context in recall and recollection

Rachel A. Diana, Andrew P. Yonelinas, & Charan Ranganath

Cognitive Neuroscience Society, 15th Annual Meeting, April 2008, San Francisco, CA

Medial temporal lobe activation during source memory retrieval: Effects of unitized vs. nonunitized encoding

Rachel A. Diana, Andrew P. Yonelinas, & Charan Ranganath

Cognitive Neuroscience Society, 14th Annual Meeting, May 2007, New York, NY

Contributions of recollection and familiarity to source memory for intra-item and extra-item source information: Testing a hypothesis generated from imaging data.

Rachel A. Diana, Andrew P. Yonelinas, & Charan Ranganath

Neuroimaging and Psychological Theories of Memory, August 2006, Marburg, Germany

Identifying the ERP correlate of a recognition memory search attempt

Rachel A. Diana, Kaia Vilberg, & Lynne M. Reder

Psychonomic Society, 46th Annual Meeting, November 2005, Toronto, Canada

Manipulating word frequency effects by varying processing demands: Low frequency words are more difficult to encode

Rachel A. Diana & Lynne M. Reder

Cognitive Neuroscience Society, 12th Annual Meeting, April 2005, New York, NY

Identifying the ERP correlate of a recognition memory search attempt

Rachel A. Diana, Kaia Vilberg, & Lynne M. Reder

Psychonomic Society, 45th Annual Meeting, November 2004, Minneapolis, MN

The Other Race Effect: How do processing time and distracting contexts influence recognition of faces?

Rachel A. Diana & Lynne M. Reder

Psychonomic Society, 43rd Annual Meeting, November 2002, Kansas City, KS

The effects of irrelevant perceptual information on memory for faces

Rachel A. Diana & Lynne M. Reder

Kent Forum on Visual Metacognition, June 2002, Kent, OH

The effects of irrelevant perceptual information on memory for faces

Rachel A. Diana & Lynne M. Reder

Southeastern Psychological Association, 46th Annual Meeting, March 2000, New Orleans, LA

The effect of selection condition on group performance and leader evaluation

Rachel A. Diana & Leslie L. Baylis

HONORS AND AWARDS:

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| 2017 | Teacher of the Week, Center for Instructional Development and Educational Research, Virginia Tech |
| 2015 | President, Southeastern Workers in Memory, symposium at Southeastern Psychological Association meeting |
| 2015 | Certificate of Teaching Excellence, College of Science, Virginia Tech |
| 2009 | Pathway to Independence Award, NIMH |
| 2008 | Laird Cermak postdoctoral award, Memory Disorders Research Society |

2007	Individual Kirschstein National Research Service Award, NIMH
2002	National Science Foundation Graduate Research Fellowship
2001	Department of Psychology Outstanding Senior, Presbyterian College

TEACHING EXPERIENCE:

Cognitive Psychology (graduate course)	Spring 2012, 2013, 2014, 2015, 2016, 2017; Fall 2018
Cognitive Psychology (undergraduate course with lab)	Fall 2017; Spring 2018, 2019
Nervous Systems and Behavior	Fall 2011, 2013, 2015, 2016, 2017, 2018 Spring 2016
Nervous Systems and Behavior (asynchronous online)	Summer 2017, 2018, 2019

AD HOC JOURNAL & GRANT REVIEWS:

Acta Psychologica
Aging, Neuropsychology, & Cognition
Brain
Brain & Cognition
Brain Structure & Function
Canadian Journal of Experimental Psychology
Cognitive, Affective, & Behavioral Neuroscience
Consciousness & Cognition
Cerebral Cortex
Cortex
Developmental Science
European Journal of Neuroscience
Hippocampus
Human Brain Mapping
Journal of Experimental Psychology: General
Journal of Experimental Psychology: Learning, Memory, & Cognition
Journal of Memory and Language
Journal of Cognitive Neuroscience
Journal of Neuroscience
Learning & Memory
Memory
Memory & Cognition
 National Science Foundation
Neuron
Neuropsychologia
Public Library of Science (PLoS) One
Psychonomic Bulletin & Review
Proceedings of the National Academy of Sciences
Psychological Science
Psychophysiology
Trends in Cognitive Sciences

PROFESSIONAL SOCIETY MEMBERSHIPS:

Memory Disorders Research Society
Psychonomic Society
Society for Neuroscience