CURRICULUM VITAE

Date of Revision: May 26, 2022

Name: Robert A McDougal, PhD

School: Yale School of Medicine and the Graduate School

Education:
2000-2004   BS, Mathematics with Computer Science minor,
              University of Maryland Baltimore County, Catonsville, MD
2004-2006   MS, Mathematics, The Ohio State University, Columbus, OH
2006-2011   PhD, Mathematics, The Ohio State University, Columbus, OH
2013-2015   MS, Computational Biology and Bioinformatics, Yale University, New Haven, CT

Career/Academic Appointments:
2011-2012   Postdoctoral Associate in Computer Science, Yale University, New Haven, CT
2012-2013   Postdoctoral Associate in Neuroscience, Yale University School of Medicine, New Haven, CT
2013-2016   Postdoctoral Fellow in Medical Informatics, Yale University School of Medicine, New Haven, CT
2016-2019   Associate Research Scientist, Dept. of Neuroscience, Yale University School of Medicine, New Haven, CT
2019-present Assistant Professor, Dept. of Biostatistics, Yale School of Public Health, New Haven, CT

Professional Honors & Recognition:

University
2014   Annual research day poster half travel award. SUNY Downstate. New York, NY

Grant/Clinical Trials History:

Current Grants
  Agency: <u>NIH/NIMH</u>
  I.D.#   R01 MH086638
  Title: "Extension of NEURON simulator for simulation of reaction-diffusion in neurons"
  P.I.:   William W. Lytton and **Robert A. McDougal**
  Percent effort: 40%
  Direct costs per year: $332,201
  Total costs for project period: $2,070,667 (of which $409,563 is indirects)
  Project period: 07/01/2016 – 04/30/2026

  Agency: <u>NIH/NINDS</u>
  I.D.#   R01 NS011613
  Title: "Computer Methods for Physiological Problems"
  P.I.:   Michael L. Hines, PhD

Role on Project: Co-investigator
Percent effort: 15%
Direct costs per year: $218,750
Total costs for project period: $1,465,624
Project period: 2018 – 2022

Agency: <u>NIH/NIAID</u>
I.D.#   U19 AI089992-09S4
Title: "Systems Immune Profiling of Divergent Responses to Infection; Core B: Data Management
          and Analysis"
P.I.:   Steven Kleinstein, PhD
Role on Project: Co-Investigator
Percent effort: 10%
Direct costs per year: $274,881
Total costs for project period: $454,168
Project period: 2020 - 2021

Past Grants

Agency: <u>NIH/NIDCD</u>
I.D.#   R01 DC009977
Title: "SenseLab: Integration of Multidisciplinary Sensory Data"
P.I.:   **Robert A. McDougal, PhD**
          (sole PI for last year; previously multi-PI with Gordon M. Shepherd and Michael L. Hines)
Percent effort: 2%
Direct costs per year: $386,520
Total costs for project period: $3,598,734
Project period: 07/01/2016 – 07/31/2021

Agency: <u>NIH/NIA</u>
I.D.#   P30 AG066508
Title: "Yale Alzheimer Disease Research Group"
P.I.:   Stephen Strittmatter
Role on Project: Collaborator
Percent effort: 7%
Direct costs per year: $275,000
Project period: 2020 – 10/31/2021

Invited Speaking Engagements, Presentations, Symposia & Workshops Not Affiliated With Yale:

International/National
2014   "ModelView: extracting model structure and presenting it on the web with NEURON". Open
       Source Brain Conference. Alghero, Italy.
2016: "The ModelDB repository as a tool for model development". Collaborative Development of
       Data-Driven Models of Neural Systems conference. Janelia Research Campus. Ashburn VA.

2016: "Neuronal calcium dynamics." University of São Paulo Ribeirão Preto NeuroMat workshop: Ribeirão Preto, Brazil.

2018: "Knowledge dissemination: model sharing and outreach." Panel speaker at Society for Simulation in Healthcare forum on modeling and simulation. Los Angeles CA.

2018: "Enabling reproducible computer modeling for integrating experimental data: insights from computational neuroscience." George Washington University Department of Epidemiology and Biostatistics seminar series: Washington, DC.

2018: "Synergistic computational approaches for catalyzing neuroscience research." University of Oklahoma Computational Biology seminar series: Norman, OK.

Regional

2016: "NEURON strategies for the simulation and visualization of spatial mathematical neuroscience models." NJIT Mathematical Biology Seminar. Newark, NJ.

2020: "Catalyzing multiscale neuroscience research." University of Connecticut, Center for Cell Analysis and Modeling CCAM Seminar Series: Farmington, CT.

2021: "Neuroinformatics." University of Connecticut, Nu Rho Psi National Honor Society in Neuroscience. Online.

Peer-Reviewed Presentations & Symposia Given at Meetings Not Affiliated With Yale:

International/National

1. **McDougal RA,** Best J. A mathematical model for intracellular PER protein dynamics. Society for Research on Biological Rhythms. Sandestin FL, May 2008. (Poster presentation).

2. **McDougal RA**, Zeki M, Lyman K, Terman DT. A working memory model based on excitatory-inhibitory interactions and calcium dynamics. Organization for Computational Neurosciences. San Antonio TX, July 2010. (Poster presentation).

3. **McDougal RA**, Terman DT. Novel patterns and dopamine modulation in a model of working memory. Workshop for Young Researchers in Mathematical Biology. Mathematical Biosciences Institute. The Ohio State University. Columbus OH, August 2011. (Oral presentation).

4. **McDougal RA**, Lytton WW, Hines ML. Object-oriented reaction-diffusion modeling in the NEURON simulator. Society for Neuroscience. Washington DC, 2011. (Poster presentation).

5. **McDougal RA**, Skolnick Y, Schaff JC, Lytton WW, Hines ML. Reaction-diffusion modeling in the NEURON simulator. Organization for Computational Neurosciences. Decatur GA, July 2012. (Poster presentation).

6. **McDougal RA**, Lytton WW, Hines ML. Modeling calcium waves and electrical dynamics in neurons. Mathematical Biosciences Institute, Workshop for Young Researchers in Mathematical Biology. Columbus OH, 2012. (Poster presentation).

7. **McDougal RA**, Lytton WW, Hines ML. Calcium-electrical interactions: an example of reaction-diffusion in the NEURON simulator. Society for Neuroscience. New Orleans LA, October 2012. (Poster presentation).

8. Neymotin S, Skolnick Y, **McDougal RA**, Hilscher M, Moulin T, Lytton W. Simulated relations of molecular, cellular, and neuronal network dynamics in a hippocampal network. Multiscale Modeling. National Institutes of Health. Bethesda MD, 2012. (Poster presentation).

9. **McDougal RA**, Hines ML, Lytton WW. Reaction-diffusion modeling in the NEURON simulator. Multiscale Modeling. National Institutes of Health. Bethesda MD, 2012. (Poster presentation).

10. Tropper C, Patoary MNI, **McDougal RA**, Hines ML, Lytton WW. Parallel stochastic simulation of neuronal reaction-diffusion equations. Society for Neuroscience. San Diego CA, November 2013. (Poster presentation).
11. Sherif MA, **McDougal R**, Neymotin S, Hines M, Lytton WW. Calcium wave propagation varies with changes in endoplasmic reticulum parameters: a computer model. Society for Neuroscience. San Diego CA, November 2013. (Poster presentation).
12. Hines ML, **McDougal RA**, Neymotin SA, Tropper C, Lytton WW. Interfaces in multiscale reaction-diffusion models in the NEURON simulator. Society for Neuroscience. San Diego CA, November 2013. (Poster presentation).
13. Morse TM, **McDougal RA**, Wang R, Hines ML, Marenco L, Carnevale NT, Shepherd GM. Using full text, context, and attributes to mine neuroscience models. Society for Neuroscience. San Diego CA, November 2013. (Poster presentation).
14. **McDougal RA**, Morse TM, Marenco L, Wang R, Hines ML, Carnevale NT, Shepherd GM. ModelView for ModelDB: Exploring model properties in a web browser. Society for Neuroscience. San Diego CA, November 2013. (Poster presentation).
15. **McDougal RA**, Shepherd GM. ModelView: An HTML5 Graphical Tool for Exploring Model Structures. NLM Informatics Training Conference. Pittsburgh PA. (Oral presentation).
16. Bulanova A, **McDougal RA**, Neymotin S, Mutai V, Lytton WW, Hines M. Integrating Systems Biology Markup Language (SBML) with NEURON. Organization for Computational Neurosciences. Quebec QC, July 2014. (Poster presentation).
17. Neymotin SA, **McDougal RA**, Hines M, Lytton WW. Calcium regulation of HCN supports persistent activity associated with working memory: a multiscale model of prefrontal cortex. Organization for Computational Neurosciences. Quebec QC, July 2014. (Poster presentation).
18. **McDougal RA**, Hines M, Lytton WW. A method for multi-simulator reaction-diffusion with NEURON. Organization for Computational Neurosciences. Quebec QC, July 2014. (Poster presentation).
19. Neymotin SA, **McDougal RA**, Hines ML, Lytton WW. Calcium regulation of HCN supports persistent activity associated with working memory: A multiscale model of prefrontal cortex. Multiscale Modeling. National Institutes of Health. Bethesda MD, 2014. (Poster presentation).
20. **McDougal RA**, Bulanova A, Patoary MNI, Tropper C, Hines ML, Lytton WW. NEURON for multiscale simulations: reaction-diffusion meets electrophysiology. National Institutes of Health. Bethesda MD, 2014. (Poster presentation).
21. Tropper C, Pataory M, **McDougal RA**, Hines ML, Lytton WW. Stochastic diffusion simulation in NEURON. Society for Neuroscience. Washington DC, November 2014. (Poster presentation).
22. Bulanova AS, **McDougal RA**, Neymotin SA, Mutai VK, Lytton WW, Hines ML. Integrating Systems Biology Markup Language (SBML) with NEURON. Society for Neuroscience. Washington DC, November 2014. (Poster presentation).
23. Neymotin SA, **McDougal RA**, Hines ML, Lytton WW. Calcium regulation of HCN supports persistent activity associated with working memory: A multiscale model of prefrontal cortex. . Society for Neuroscience. Washington DC, November 2014. (Poster presentation).
24. Shepherd GM, **McDougal RA**, Wang R, Morse TM, Carnevale NT, Marenco LN, Migliore M, Miller PL. 3D printouts of neurons and microcircuits. Society for Neuroscience. Washington DC, November 2014. (Poster presentation).
25. Morse TM, **McDougal RA**, Wang R, Marenco L, Hines M, Carnevale NT, Miller P, Shepherd GM. Advances in Senselab: ModelView, synaptic connectivity, and structured data submission. Society for Neuroscience. Washington DC, November 2014. (Poster presentation).

26. **McDougal RA**, Hines ML, Lytton WW. Calcium 'impedance mismatch' – the role of geometry on diffusion dynamics. Society for Neuroscience. Washington DC, November 2014. (Poster presentation).
27. Seidenstein AH, **McDougal RA**, Hines ML, Lytton WW. Parallelizing large networks using NEURON-Python. Organization for Computational Neurosciences. Prague, Czech Republic, 2015. (Poster presentation).
28. Seidenstein A, Neymotin SA, Fesharaki A, Hines ML, **McDougal RA**, Bulanova AS, Lytton WW. Neuronal network bump attractors augmented by calcium up-regulation of Ih in a multiscale computer model of prefrontal cortex. Society for Neuroscience. Chicago IL, October 2015. (Poster presentation).
29. Tropper C, Lin Z, **McDougal RA**, Hines M, Lytton W. Parallel reaction-diffusion simulation in NEURON. Society for Neuroscience. Chicago IL, October 2015. (Poster presentation).
30. Marenco L, Wang R, **McDougal RA**, Morse TM, Carnevale NT, Miller P, Shepherd GM. Exploring data-driven techniques for visual representation of neuronal micro-connectomes. Society for Neuroscience. Chicago IL, October 2015. (Poster presentation).
31. Morse TM, **McDougal RA**. Unified real-time searching of keywords and attributes in ModelDB. Society for Neuroscience. Chicago IL, October 2015. (Poster presentation).
32. **McDougal RA**, Bulanova AS, Hines ML, Lytton WW. Hybrid 1d/3d reaction-diffusion in the NEURON simulator. Society for Neuroscience. Chicago IL, October 2015. (Poster presentation).
33. **McDougal RA**, Hines ML, Lytton WW. Coupling 1D and 3D domains in neuroscience simulations. Multiscale Modeling. National Institutes of Health. Bethesda MD, 2015. (Poster presentation).
34. **McDougal RA**, Neymotin SA, Morse TM, Hines ML, Lytton WW, Shepherd GM. Developing models with NEURON and ModelDB. Mathematical Biosciences Institute, Modeling and Computation of Transmembrane Transport Workshop. Columbus OH, 2015. (Poster presentation).
35. Morse TM, Marenco L, **McDougal RA**, Wang R, Hines ML, Carnevale NT, Cavarretta F, Migliore M, Crasto C, Miller P, Shepherd GM. Advances in SenseLab's interoperable neuroinformatics databases: FunctionalMicroconnectomeDB and ModelDB.AChemS XXXVIII, Bonita Springs FL, 2016. (Poster presentation).
36. Ikeno H, Yamazaki T, Kannon T, Okumura Y, Kamiyama Y, Ishihara A, Inagaki K, Hirata Y, Satoh S, Wagatsuma H, Asai Y, Yamaguchi Y, **McDougal R**, Wang R, Marenco L, Morse T, Shepherd G, Usui S. Development of an on-line simulation environment for computational neuroscience. Advances in Neuroinformatics. Wakō, Saitama, Japan, 2016. (Poster presentation).
37. Marenco L, Wang R, **McDougal RA**, Morse TM, Carnevale NT, Miller PL, Shepherd GM. Development of FunctionalConnectomeDB within SenseLab to incorporate and mine functional connectomics data. Society for Neuroscience. San Diego CA, November 2016. (Poster presentation).
38. Seidenstein A, **McDougal RA**, Hines ML, Lytton WW. Mosaic multiscale computer modeling of ischemic stroke. Society for Neuroscience. San Diego CA, November 2016. (Poster presentation).
39. Morse TM, **McDougal RA**, Carnevale NT, Marenco L, Wang R, Migliore M, Miller PL, Shepherd GM, Hines ML. Recent advances in ModelDB. Society for Neuroscience. San Diego CA, November 2016. (Poster presentation).
40. Shepherd GM, Morse TM, **McDougal RA**. Automated metadata identification for better model discovery. Society for Neuroscience. San Diego CA, November 2016. (Poster presentation).
41. **McDougal RA**, Tropper C, Hines ML, Lytton WW. Expanding NEURON support for reaction-diffusion models. Society for Neuroscience. San Diego CA, November 2016. (Poster presentation).

42. Newton AJH, **McDougal RA**, Tropper C, Seidenstein AH, Lytton WW. Expanding NEURON to bridge electrophysiology, chemical, and network scales: simulations of ischemic stroke. Multiscale Modeling. National Institutes of Health. Bethesda MD, 2017. (Poster presentation).
43. Newton A, Seidenestein A, **McDougal R**, Lytton W. Multiscale modeling of ischemic stroke with the NEURON reaction-diffusion model. Organization for Computational Neurosciences. Antwerp, Belgium, 2017. (Poster presentation).
44. **McDougal R**, Lytton W. Accelerating NEURON reaction-diffusion simulations. Organization for Computational Neurosciences. Antwerp, Belgium, 2017. (Poster presentation).
45. **McDougal RA**, Hines ML, Lytton WW. Using NEURON to incorporate reaction-diffusion into cellular and network models. Reaction-diffusion modeling for neurobiology workshop. Organization for Computational Neurosciences workshop. Antwerp, Belgium, July 2017. (Oral presentation).
46. **McDougal RA**, Hines ML, Lytton WW. Multiscale modeling with the NEURON Reaction-Diffusion Module. Multiscale modeling and simulation workshop. Bernstein Conference. Göttingen, Germany, September 2017. (Oral presentation).
47. Neymotin SA, Peled N, **McDougal RA**, Carnevale NT, Hines ML, Hamalainen M, Jones SR. Human neocortical neurosolver (HNN): A new computational tool for localizing and interpreting human neocortical dynamics. Society for Neuroscience. Washington DC, November 2017. (Poster presentation).
48. Surles-Zeigler M, Morse TM, **McDougal RA**, Shepherd GM. Integrating molecular markers and gene expression in SenseLab for neuroinformatics-driven discovery. Society for Neuroscience. Washington DC, November 2017. (Poster presentation).
49. Seidenstein A, Newton A, **MacDougal** (*sic)* **RA**, Lytton WW. Multiscale computer modeling of penumbral zones in brain ischemia. Society for Neuroscience. Washington DC, November 2017. (Poster presentation).
50. Newton A, **McDougal RA**, Hines ML, Miyazaki K, Ross WN, Lytton WW. Modeling electrodiffusion with the NEURON reaction-diffusion module. Society for Neuroscience. Washington DC, November 2017. (Poster presentation).
51. Morse TM, Wang R, Carnevale NT, Shepherd GM, **McDougal RA**. Pipeline to promote discovery and sharing of computational neuroscience research. Society for Neuroscience. Washington DC, November 2017. (Poster presentation).
52. **McDougal RA**, Newton AJH, Patoary MNI, Tropper C, Hines ML, Lytton WW. Parallel stochastic spines in NEURON reaction-diffusion simulations. Society for Neuroscience. Washington DC, November 2017. (Poster presentation).
53. Newton AJH, Seidenstein AH, **McDougal RA**, Hines ML, Lytton WW. Expanding NEURON extracellular reaction-diffusion support: simulation of ischemic stroke. Multiscale Modeling. National Institutes of Health. Bethesda MD, 2018. (Poster presentation).
54. Newton AJH, Seidenstein AH, **McDougal RA**, Hines ML, Lytton WW. Extracellular reaction-diffusion in the NEURON simulator: modeling ischemic stroke. Organization for Computational Neurosciences. Seattle WA, July 2018. (Poster presentation).
55. **McDougal RA**, Newton AJH, Lytton WW. Building and visualizing reaction-diffusion simulations in NEURON cellular mechanisms. Organization for Computational Neurosciences. Seattle WA, July 2018. (Poster presentation).
56. **McDougal RA**, Hines ML. Strategies for Parallel NEURON Simulations. Organization for Computational Neurosciences workshop. Seattle WA, July 2018. (Oral presentation).
57. Neymotin SA, Daniels DS, Peled N, **McDougal RA**, Carnevale NT, Moore CI, Hines ML, Hamalainen M, Jones SR. Human neocortical neurosolver (HNN): a new software tool for interpreting the circuit level origin of human MEG/EEG data. Society for Neuroscience. San Diego CA, November 2018. (Poster presentation).

58. Newton A, Seidenstein AH, Hines ML, **McDougal RA**, Lytton WW. Multiscale simulation of spreading depolarization in ischemic stroke. Society for Neuroscience. San Diego CA, November 2018. (Poster presentation).
59. Surles-Zeigler M, Morse TM, **McDougal RA**, Shepherd GM. Integrating gene and protein data into SenseLab databases for neuroinformatics-driven discovery. Society for Neuroscience. San Diego CA, November 2018. (Poster presentation).
60. Morse TM, **McDougal RA**. Enhancing computational model discovery via network visualization and analysis. Society for Neuroscience. San Diego CA, November 2018. (Poster presentation).
61. **McDougal RA**, Newton A, Hines ML, Lytton WW. Building, simulating, and visualizing reaction-diffusion models with NEURON's enhanced rxd module. Society for Neuroscience. San Diego CA, November 2018. (Poster presentation).
62. Conte C, Newton AJH, Eggleston L, Hines ML, Lytton WW, **McDougal RA**. Accelerating 3D intracellular NEURON simulations. Organization for Computational Neurosciences. Barcelona Spain, July 2019. (Poster presentation).
63. Caldwell B, Neymotin SA, Daniels D, Jas M, Peled N, **McDougal RA**, Dura-Bernal S, Cantarelli M, O'Connell MN, Barczak A, McGinnis TM, Lakatos P, Moore CI, Carnevale NT, Hines ML, Hamalainen M, Jones SR. Human neocortical neurosolver: a user-friendly software tool for cellular- and circuit-level interpretation of EEG/MEG. Society for Neuroscience. Chicago IL, October 2019. (Poster presentation).
64. Newton AJH, Hines ML, Lytton WW, **McDougal RA**. Homeostasis and spreading depolarization in multiscale simulation of ischemic stroke. Society for Neuroscience. Chicago IL, October 2019. (Poster presentation).
65. Newton AJH, Conte C, Eggleston L, Blasy E, Hines ML, Lytton WW, **McDougal RA**. Efficient *in silico* 3D intracellular neuron simulation. Society for Neuroscience. Chicago IL, October 2019. (Poster presentation).
66. Cudone E, Taylor RA, **McDougal RA**. Unsupervised literature tagging of computational neuroscience literature, towards question answering. NLM Informatics Training Conference. Online, 2019. (Poster presentation).
67. Cudone E, **McDougal R**. Unsupervised metadata tagging of computational neuroscience literature, towards question answering. Organization for Computational Neurosciences. Online, July 2020. (Poster presentation).
68. Newton AJH, Kelley C, Hines ML, Lytton WW, **McDougal RA**. Multiscale simulations of ischemia and spreading depolarization with NEURON. Organization for Computational Neurosciences. Online, July 2020. (Poster presentation).
69. **McDougal RA**, Eggleston, L. The NEURON simulator. Organization for Computational Neurosciences workshop on tools and resources for developing and sharing models in computational neuroscience. Online, July 2020. (Oral presentation).
70. Cudone E, **McDougal R**. Next-spike-time variation in biophysical computational neuroscience models. NLM Informatics Training Conference. Online, June 2021. (Oral presentation).
71. Mullin S, **McDougal R**, Cheung K, Kilicoglu H, Beck A, Zeiss C. Chemical Entity Normalization for Successful Translational Development of Alzheimer's Disease and Dementia Therapeutics. International Society for Computational Biology Conference. Online, July 2021. (Oral presentation).
72. Cudone E, **McDougal RA**. Empirically-based event-drive neuron model. Frontiers in Applied and Computational Mathematics. Newark, NJ. May 2022. (Poster presentation).

Regional

1. Neymotin SA, Skolnick Y, Hilscher MM, Moulin T, **McDougal RA**, Hines ML, Lytton WW. Ih tunes theta/gamma oscillations and cross-frequency coupling in an in silico CA3 model. Rhythmic Dynamics and Cognition Conference, MIT, Boston MA, 2013. (Poster presentation).

Professional Service

Peer Review Groups/Grant Study Sections:

2015	Ad hoc member, study section on Neurotransporters, Receptors, Channels and Calcium Signaling (NTRC), NIH.
2017	Member, Special Review Group ZMH1 ERB-C (04) Data Archives and Standards for the BRAIN Initiative. NIH/NIMH
2018	Ad hoc member, study section on MSM (PAR-15-085), NIH.
2019	Ad hoc member, study section on Neurotransporters, Receptors, Channels and Calcium Signaling (NTRC), NIH.
2020	Member, Special Emphasis Panel ZGM1 BBCB-4 (NR), NIH/NIGMS (March, November).
2021	Mail reviewer, study section on Synapses, Cytoskeleton and Trafficking 2021/05 SYN.

Advisory Boards:

2016 – 2019	NeuroML Editorial Board
2020 – present	NeuroML Scientific Committee

Journals:

Editor/Associate Editor

2017-2021	Guest Associate Editor, *Frontiers in Neuroinformatics.* Research topic on: "Reproducibility and Rigour in Computational Neuroscience."
2022	Associate Editor, *Frontiers in Systems Biology* section on Integrative Systems Neuroscience.

Reviewer

Neural Networks, *Journal of Computational Neuroscience*, *Neuroinformatics*, *Frontiers in Neuroinformatics*, *Frontiers in Cellular Neuroscience*, *Journal of Neuroscience Methods, PLOS Computational Biology*

Professional Organizations:

2007 – present	Member	American Mathematical Society
2007 – present	Member	Society for Industrial and Applied Mathematics
2011 – present	Member	Society for Neuroscience
2012 – present	Member	Organization for Computational Neurosciences
2019 – present	Member	American Medical Informatics Association

Public Service:

2013   Judge, New Haven Public School Science Fair.
2013-2019,   Judge, Connecticut STEM Fair (formerly Southern Connecticut Invitational Science &
2021   Engineering Fair).
2014-2016   Tutor for summer web development course. New Haven Reads.
2018-2022   Judge, SIAM/Mathworks Math Modeling Competition.

Bibliography:

Peer-Reviewed Original Research
1.   Gu Y, Barry J, **McDougel R** (*sic*), Terman D, Gu C. Alternative splicing regulates Kv3.1 polarized targeting to adjust the maximal spiking frequency. *J Biol Chem.* 2012, 287(3):1755-1769. PubMed PMID: 22105078; PubMedCentral PMCID: PMC3265858. DOI:10.1074/jbc.M111.299305

2.   **McDougal RA**, Hines ML, Lytton WW. Water-tight membranes from neuronal morphology files. *J Neuro Meth*. 2013, 220(2): 167-178. PubMed PMID: 24091136; PubMedCentral PMCID: PMC4197804. DOI:10.1016/j.jneumeth.2013.09.011

3.   **McDougal RA**, Hines ML, Lytton WW. Reaction-diffusion in the NEURON simulator. *Frontiers in Neuroinformatics.* 2013, 7:28. PubMed PMID: 24298253. PubMedCentral PMCID: PMC3828620. DOI:10.3389/fninf.2013.00028

4.   Neymotin SA*, **McDougal RA***, Sherif MA, Fall CP, Hines ML, Lytton WW. Neuronal calcium wave propagation varies with changes in endoplasmic reticulum parameters: a computer model. *Neural Computation.* 2015, 27(4): 898-924. PubMed PMID:25734493. PubMedCentral PMCID: PMC4386758. DOI:10.1162/NECO_a_00712

5.   **McDougal RA**, Morse TM, Hines ML, Shepherd GM. ModelView for ModelDB: Online Presentation of Model Structure. *Neuroinformatics*. 2015, 13(4), 459-470. PubMed PMID: 25896640. PubMedCentral PMCID: PMC4618280. DOI:10.1007/s12021-015-9269-2

6.   **McDougal RA**, Shepherd GM. 3D-printer visualization of neuron models. *Frontiers in Neuroinformatics*. 2015, 9. PubMed PMID:26175684. PubMedCentral PMCID: PMC4485057. DOI:10.3389/fninf.2015.00018

7.   Neymotin SA, **McDougal RA**, Bulanova AS, Zeki M, Lakatos P, Terman D, Hines ML, Lytton WW. Calcium regulation of HCN channels supports persistent activity in a multiscale model of neocortex. *Neuroscience*. 2016, 316, 344-366. PubMed PMID:26746357. PubMedCentral PMCID:PMC4724569. DOI:10.1186/1471-2202-15-S1-P108

8.   Lytton WW, Seidenstein AH, Dura-Bernal S, **McDougal RA**, Schürmann F, Hines ML. Simulation neurotechnologies for advancing brain research: Parallelizing large networks in NEURON. PubMed PMID:27557104. PubMedCentral PMCID:PMC5295685. *Neural Computation*. 2016, 28(10), 2063-2090. DOI:10.1162/NECO_a_00876

9.   Lin Z, Tropper C, McDougal RA, Ishlam Patoary MN, Lytton WW, Yao Y, & Hines ML. Multithreaded stochastic pdes for reactions and diffusions in neurons. *ACM Transactions on Modeling and Computer Simulation (TOMACS)*. 2016, 27(2), 1-27. PubMed PMID:28943743. PubMedCentral PMCID:PMC5604336. DOI:10.1145/2987373

10. Newton AJH, **McDougal RA**, Hines ML, Lytton WW: Using NEURON for reaction-diffusion modeling of extracellular dynamics. *Frontiers in Neuroinformatics*. 2018, 12:41. PubMed PMID:30042670. PubMedCentral PMCID:PMC6049079. DOI:10.3389/fninf.2018.00041

11. Patoary MNI, Tropper C, **McDougal RA**, Lin Z, Lytton WW. Parallel stochastic discrete event simulation of calcium dynamics in NEURON. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*. 2019, 16(3):1007-1019. PubMed PMID:28961124. PubMedCentral PMCID: PMC5869087. DOI:10.1109/TCBB.2017.2756930

12. Dura-Bernal S, Suter B, Gleeson P, Cantarelli M, Quintana A, Rodriguez F, Kedziora DJ, Chadderdon GL, Kerr CC, Neymotin SA, **McDougal RA**, Hines M, Shepherd GMG, Lytton WW. NetPyNE, a tool for data-driven multiscale modeling of brain circuits. *eLife*. 2019. PubMed PMID:31025934. PubMedCentral PMCID:PMC6534378. DOI: 10.7554/eLife.44494

13. Gleeson P, Cantarelli M, Marin B, Quintana A, Earnshaw M, Piasini E, Birgiolas J, Cannon RC, Cayco-Gajic NA, Crook S, Davison AP, Dura-Bernal S, Ecker A, Hines ML, Idili G, Larson S, Lytton WW, Majumdar A, **McDougal RA**, Sivagnanam S, Solinas S, Stanislovas E, Van Albada SJ, Van Geit W, Silver RA. Open Source Brain: a collaborative resource for visualizing, analyzing, simulating and developing standardized models of neurons and circuits. *Neuron*. 2019. PubMed PMID:31201122. PubMedCentral PMCID:PMC6693896. DOI:10.1016/j.neuron.2019.05.019

14. **McDougal R. A.**, Dalal I, Morse TM, Shepherd GM. Automated metadata suggestion during repository submission. *Neuroinformatics*. 2019, 17:361. PubMed 30382537. PMCID: PMC6494730. DOI: 10.1007/s12021-018-9403-z.

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