GREGORY WILLIAM CARTER, PHD

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POSITIONS – Primary Appointments

Professor, Bernard and Lusia Milch Endowed Chair, The Jackson Laboratory, 2021-Present

Associate Professor, The Jackson Laboratory, 2016-2021

Assistant Professor, The Jackson Laboratory, 2010-2016

Senior Research Scientist, Institute for Systems Biology, 2007-2010

Postdoctoral Research Fellow, Galitski Lab, Institute for Systems Biology, 2003-2007

Postdoctoral Research Fellow, Physics, University of Washington (Seattle), 2001-2003

Postdoctoral Research Associate, Physics, Stony Brook University (New York), 1999-2001

Postdoctoral Research Fellow and Leon Rosenfeld Fellow, Physics, The Niels Bohr Institute (Copenhagen, Denmark), 1997-1999

POSITIONS – Secondary Appointments

Joint Investigator at Sage Bionetworks, 2021-Present

Affiliate Professor, Computer Science and Engineering Dept, University of Connecticut, 2020-Present

Affiliate Professor, Tufts University School of Medicine, Tufts University, 2011-Present

Graduate Faculty, Graduate School of Biological Sciences, University of Maine, 2010-Present

EDUCATION

Ph. D. in Physics, University of Minnesota (Minneapolis, MN), 1997.
Thesis: *A Chiral Effective Lagrangian Approach to Nuclear Physics.* Advisor: Paul J. Ellis.

B. S. in Physics, Case Western Reserve University (Cleveland, OH), 1993.

FUNDING – Active

NIH/NIA **U54** AG054345   Lamb, Carter, et al. (multi-PI)   9/2022-8/2027
The IU/Jax/Pitt MODEL-AD Center
Role: Head of Bioinformatics and Data Management

NIH/NIA **U19** AG074866   Carter, Silva, Rizzo (multi-PD/PI)   9/2022-8/2027
Generation, Characterization, and Validation of Marmoset Models of Alzheimer's Disease (MARMO-AD)
Role: Head of Bioinformatics and Data Integration, Project Lead, PD.

NIH/NIA **RF1** AG075701   Carter, Sasner (multi-PI)   9/2022-8/2027
Modeling the Genetic Interaction Between Klotho and APOE Alleles in Alzheimer's Disease

NIH/NIA **U54** AG065187   Levey, Carter, Edwards, Greewood, et al. (multi-PD/PI) 9/2019-8/2024
The Open Drug Discovery Center for Alzheimer's Disease, aka TREAT-AD
Role: Head of Bioinformatics

NIH/NIA **R21** AG083299   Li, Carter (multi-PI)   8/2023-8/2025
An Explainable Unified AI Strategy for Efficient and Robust Integrative Analysis of Multi-omics Data
TJL DIF FY22 (Jackson Lab)   Carter, Pera, Greene (multi-PI)   7/2022-6/2024

Differentiation and characterization of iPS cell lines from marmoset models of Alzheimer's disease

NIH/NIA **R01** AG060477   Grinberg, Neylan (mPI), Carter (Co-I)   9/2023-8/2028
Clinical Features and Neuropathological Basis of Sleep Wake Behavior in Alzheimer's and PSP

NIH/NIA **RF1** AG079125   Koob (PI), Carter (Co-I)   9/2022-8/2027
Full Human Gene Replacement Mouse Models of Alzheimer's Disease

NIH/NIDA **U01** DA051235   Kumar (PI), Carter (Co-I)   9/2021-8/2026
Identification of Genetic and Genomic Variants by Next-Gen Sequencing in Nonhuman Animal Models

NIH/NIA **RF1** AG059778   O'Connell (PI), Carter (Co-I)   8/2018-8/2023
Gene x Environment Interactions in Hypothalamic Dysfunction in Alzheimer's Disease NIH/NCI

DoD HT9425-23-1-0308   Chang (PI), Carter (Co-I)   7/2023-6/2027
Determining the Earliest Determinants of Lupus Disease Risk that Predict Outcomes

P30 CA034196   Palucka (PI)   4/2020-3/2025
Cancer Center Support (CORE)
Role: Co-Project Lead, Computational Sciences Shared Resource

NIH/NEI **R01** EY034988   Naggert (PI), Carter (Co-I)   4/2023-3/2028
Identifying mechanistic pathways underlying RPE pathogenesis in models of pattern dystrophy

NIH/NEI **R01** EY011996   Nishina (PI), Carter (Co-I)   5/2023-4/2027
Retinal Disease: Molecular Basis and Pathophysiology

FUNDING – Completed

NIH/NIA **RF1** AG055104   Carter, Howell, Sasner (multi-PI)   3/2018-2/2023
Determining Genetic Interactors of Apolipoprotein E in Alzheimer's disease

NIH/NIA **U54** AG054345   Carter, Howell, Lamb, Territo (multi-PI)   9/2016-8/2022
Alzheimer's Disease Translational Center for Disease Model Resources, aka MODEL-AD
Role: Head of Bioinformatics and Data Management

NIH/NEI **R01** EY027860   Carter, Nishina (multi-PI)   5/2017-4/2022
Identifying Shared Pathogenic Networks and Molecular Targets Underlying Retinal Pigmented Epithelial Associated Disease

NIH/NIGMS **R01** GM115518   Carter (PI)   9/2016-8/2021
Methods and Tools to Analyze Genetic Complexity

NIH/NIGMS **P01** GM099640   Paigen (PI)   9/2013-7/2018
Molecular Regulation of Mammalian Meiosis
Role: Project Leader and Head of Computational Core

NIA/NIGMS **P50** GM076468   Churchill (PI)   7/2011-6/2016
Center for Genome Dynamics   Project G: Using Multiple Phenotypes to Model Genetic Epistasis
Role: Project Leader

NIH/NIGMS **K25** GM079404   Carter (PI)   9/2007-8/2013
Inference and Testing of Quantitative Models of Genetic Interaction

PUBLICATIONS – Biology, Peer Reviewed (*equal contribution, †corresponding author)

1. Lomoio S, Pandey RS, Roleau N, Menicacci B, Kim WH, Cantley WL, Haydon PG, Bennett DA, Young-Pearse TL, **Carter GW**, Kaplan DL, and Tesco G†. 2022. *A 3D bioengineered neural tissue model generated from patient-derived iPSCs develops Alzheimer's disease-related phenotypes.* Molecular Psychiatry, in press. BioRxiv doi.org/10.1101/2022.07.21.501004.

2. Tyler AL, Spruce C, Kursawe R, Haber A, Ball RL, Pitman WA, Fine AD, Raghupathy N, Walker, M, Philip VM, Baker CL, Mahoney JM, Churchill GA, Trowbridge JJ, Stitzel ML, Paigen K, Petkov PM, **Carter GW†.** 2023. *Variation in histone configurations correlates with gene expression across nine inbred strains of mice*. Genome Research (in press) and doi:10.1101/gr.277467.122.

3. Axtman, AD, Brennan P, Brinton, TF, Betarbet R, **Carter GW**, Edwards AM, Fu H, Gileadi O, Greenwood AK, Leal, K, Longo F, Levey A. 2023. *Open Drug Discovery in Alzheimer's Disease*, Alzheimer's & Dementia: Translational Research & Clinical Interventions (in press).

4. Pandey RS, Kotredes KP, Sasner M, Howell GR, **Carter GW†**. 2023. *Differential splicing of neuronal genes in a Trem2*R47H mouse model mimic alterations associated with Alzheimer's disease*. BMC Genomics, **24**:172, doi.org/10.1186/s12864-023-09280-x.

5. Osse AML, Pandey RS, Wirt RA, Ortiz AA, Salazar A, Kimmich M, Strom EN, Oblak A, Lamb BT, Hyman JM, **Carter GW**, Kinney JW†. 2023. *Reduction in GABAB on glia induce Alzheimer's disease related changes*. Brain Behavior Immunity, 110:260-275, doi.org/10.1016/j.bbi.2023.03.002.

6. Barendrecht S, Schreurs A, Geissler S, Sabanov V, Ilse V, Rieckmann V, Eichentopf R, Künemund A, Hietel B, Wussow S, Hoffmann K, Körber-Ferl K, Pandey R, **Carter GW**, Demuth H-U, Holzer M, Roßner S, Schilling S, Preuss C, Balschun D, Cynis H†. 2022. *A novel human tau knock-in mouse model reveals interaction of Abeta and human tau under progressing cerebral amyloidosis in 5xFAD mice*. Alzheimer's Research & Therapy, **15**(1):16, doi.org/10.1186/s13195-022-01144-y.

7. Pandey RS, Krebs MP, Bolisetty MT, Charette JR, Naggert JK, Robson P, Nishina P†, **Carter GW†**. 2022. *Single-cell RNA sequencing reveals molecular features of heterogeneity in the murine retinal pigment epithelium*. Int J Mol Sci **23**:10419, doi.org/10.3390/ijms231810419.

8. Onos KD†, Quinney SK, Jones DR, Masters AR, Pandey R, Keezer KJ, Biesdorf C, Metzger IF, Meyers JA, Peters J, Persohn SC, McCarthy BP, Bedwell AA, Figueiredo LL, Cope ZA, Sasner M, Howell GR, Williams HM, Oblak AL, Lamb BT, **Carter GW**, Sukoff Rizzo SJ, Territo P. 2022. *Pharmacokinetic, pharmacodynamic, and transcriptomic analysis of chronic levetiracetam treatment in 5XFAD mice: A MODEL-AD preclinical testing core study.* Alzheimer's & Dementia: Translational Research & Clinical Interventions, **8**(1):e12329, doi.org/10.1002/trc2.12329

9. Oblak AL†, Cope ZA, Quinney SK, Pandey R, Biesdorf C, Masters AR, Onos KD, Haynes L, Keezer KJ, Meyer JA, Peters J, Persohn SC, Bedwell AA, Elridge K, Speedy R, Little G, Williams SP, Noarbe B, Obenaus A, Sasner M, Howell G, **Carter GW**, Williams H, Lamb BT, Territo PR, Sukoff Rizzo SJ. 2022. *Prophylactic Evaluation of Verubecestat on disease and symptom modifying effects in 5XFAD Mice*, Alzheimer's & Dementia: Translational Research & Clinical Interventions, **8**(1):e12317, doi.org/10.1002/trc2.12317.

10. Oblak AL†, Kotredes KP, Pandey R, Reagan AM, Ingraham C, Perkins B, Lloyd C, Baker D, Lin PB, Soni DM, Tsai A, Persohn SC, Bedwell AA, Elridge K, Speedy R, Meyers JA, Peters J, Figureiredo LL, Sasner M, Territo PR, Sukoff Rizzo SJ, **Carter GW**, Lamb BT, Howell GR†. 2022. *Plcg2M28L interacts with high fat-high sugar diet to accelerate Alzheimer's disease-relevant phenotypes in mice*, Frontiers in Aging Neuroscience, **14**:886575, doi.org/10.3389/fnagi.2022.886575.

11. Weatherly SM, Collin GB, Charette JR, Stone L, Damkham N, Peterson JG, Hick W, **Carter GW**, Naggert JK, Krebs MP, Nishina PM†. 2022. *Identification of Arhgef12 and Prkci as Genetic Modifiers of Retinal Dysplasia in the Crb1rd8 Mouse Model*, PLoS Genetics **18**(6): e1009798, doi.org/10.1371/journal.pgen.1009798.

12. Wells AE, Barrington WT, Dearth S, Milind N, **Carter GW**, Threadgill DW, Voy BH†. 2022. *Independent and Interactive Effects of Genetic Background and Sex on Tissue Metabolomes of Adipose, Skeletal Muscle, and Liver in Mice*, Metabolites, **12**(4):337, doi.org/10.3390/metabo12040337.

13. Foley K, Hewes AA, Garceau D, Kotredes K, **Carter GW**, Sasner M, Howell GR†. 2022. *The APOEε3/ε4 genotypes drives distinct gene signatures in the cortex of young mice*, Frontiers in Aging Neuroscience, **14**:838436.

14. Gogna N, Weatherly , Zhao F, Collin GB, Pinkney J, Stone L, Naggert JK, **Carter GW**, Nishina PM†. 2021. *Genetic Interaction between Mfrp and Adipor1 Mutations Affect Retinal Disease Phenotypes*, Int J Mol Sci, **23**(3):1615.

15. Kotredes KP, Oblak AL, Pandey RS, Lin PB, Garceau D, Williams H, Uyar A, O'Rourke R, O'Rourke S, Ingraham C, Bednarczyk D, Belanger M, Cope Z, Foley KE, Logsdon BA, Mangravite LM, Sukoff Rizzo SJ, Territo PR, **Carter GW**, Sasner M, Lamb BT, Howell GR. 2021. *Uncovering disease mechanisms in a novel mouse model expressing humanized APOEε4 and Trem2*R47H*. Front Aging Neurosci. **13**:735524.

16. Oblak AL, Lin P, Kotredes KP, Pandey R, Garceau D, Williams HM, Uyar A, O'Rourke R, O'Rourke S, Ingraham C, Bednarycek D, Belanger M, Cope Z, Little GJ, Williams S-P, Ash C, Bleckert A, Ragan TM, Logsdon BA, Mangravite LM, Sukoff Rizzo S, Territo PR, **Carter GW**, Howell GR, Sasner M, Lamb BT. 2021. *Comprehensive Evaluation of the 5XFAD Mouse Model for preclinical testing applications: A MODEL-AD Study.* Front Aging Neurosci, **13**: 713726.

17. Li Y, Haber A, Preuss C, John C, Uyar A, Yang H, Logsdon BA, Philip V, Karuturi K, ADNI Consortium, **Carter GW†**. 2021. *Transfer learning-trained convolutional neural networks identify novel MRI biomarkers of Alzheimer's disease progression,* Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring, **13**(1):e12140.

18. Tyler AL, El Kassaby B, Kolishovski G, Emerson J, Wells A, Mahoney JM, **Carter GW†**. 2021. *Effects of kinship correction on inflation of genetic interaction statistics in commonly used mouse populations*, G3, jkab131.

19. Yang HS, Onos KD, Choi KB, Keezer KJ, Skelly DA, **Carter GW**, Howell GR†. 2020. *Natural genetic variation determines microglia heterogeneity in wild-derived mouse models of Alzheimer's disease*, Cell Reports, **34**(6):108739.

20. Oblak AL, Forner S, Territo PR, Sasner M, **Carter GW**, Howell GR, Sukoff-Rizzo SJ, Logsdon BA, Mangravite LM, Mortazavi A, Baglietto-Vargas D, Green KN, Macgregor GR, Wood MA, Tenner AJ, LaFerla FM, Lamb BT†. 2020. *Model Organism Development and Evaluation for Late-Onset Alzheimer's Disease: MODEL-AD*, Alzheimer's & Dementia: Translational Research & Clinical **6**:e12110.

21. Preuss C, Pandey RS, Piazza E, Fine A, Uyar A, Perumal T, Garceau D, Kotredes KP, Williams H, Mangravite LM, Lamb BT, Oblak AL, Howell GR, Sasner M, Logsdon BA, **Carter GW†**. 2020*. A novel systems biology approach to evaluate mouse models of late-onset Alzheimer's disease*, Molecular Neurodegeneration **15**:67.

22. Mukherjee S, Heath L, Preuss C, Jayadev S, Garden G, Greenwood AK, Sieberts SK, De Jager PL, Eretkin-Taner N, **Carter GW**, Mangravite LM†, Logsdon BA†. 2020. *Molecular estimation of neurodegeneration pseudotime in older brains*, Nature Communications **11**:5781.

23. Wan Y-W, Al-Ouran R, Mangleburg CG, Perumal TM, Lee TV, Allison K, Swarup V, Funk CC, Gaiteri C, Allen M, Wang M, Neuner SM, Kaczorowski CC, Philip VM, Howell GR, Martini-Stoica H, Zheng H, Mei H, Zhong X, Kim JW, Dawson VL, Dawson TM, Pao P-C, Tsai L-H, Haure-Minrande J-V, Ehrlich ME, Chakrabart P, Levites Y, Wang X, Dammer EB, Srivastava G, Mukherjee S, Sieberts SK, Omberg L, Dang KD, Eddy JA, Snyder P, Chae Y, Amberkar S, Wei W, Hide W, Preuss C, Ergun A, Ebert PJ, Airey

DC, Mostafavi S, Yu L, Klein H-U, AMP-AD Consortium, **Carter GW**, Collier DA, Golde TE, Levey AI, Bennett DA, Estrada K, Townsend TM, Zhang B, Schadt E, De Jager PL, Price ND, Ertekin-Taner N, Liu Z, Shulman JM†, Mangravite LM†, Logsdon BA†. 2020. *Meta-analysis of the Alzheimer's disease brain transcriptome and functional dissection in mouse models*, Cell Reports **32**(2):107908.

24. Milind N, Preuss C, Haber A, Ananda G, Mukherjee S, John C, Shapley S, Tyler AL, Logsdon BA, Crane PA, **Carter GW†**. 2020. *Transcriptomic Stratification of Late-Onset Alzheimer's Cases Reveals Novel Genetic Modifiers of Disease Pathology*, PLoS Genetics **16**(6): e1008775.

25. Spruce C, Dlamini S, Ananda G, Bronkema N, Tian H, Paigen K, **Carter GW**, Baker CL†. 2020. *HELLS and PRDM9 form a Pioneer Complex to Open Chromatin at Meiotic Recombination Hotspots*, Genes and Development **34**(5-6):398-412.

26. Pandey RS, Graham L, Uyar A, Preuss C, Howell GR†, **Carter GW†**. 2019. *Genetic perturbations of disease risk genes in mice capture transcriptomic signatures of late-onset Alzheimer's disease*, Molecular Neurodegeneration **14**(1):50.

27. Chintapaludi SR, Uyar A, Jackson HM, Acklin CJ, Wang X, Sasner M, **Carter GW†**, Howell GR†. 2019. *Staging Alzheimer's disease in the brain and retina of B6.APP/PS1 mice by transcriptional profiling,* J Alzheimers Dis **73**(4):1421-1434.

28. Tyler AL, Mahoney JM, **Carter GW†**. 2019. *Genetic interactions affect lung function in patients with systemic sclerosis*, G3 **10**(1):151-163.

29. Onos K, Uyar A, Keezer KJ, Jackson HM, Preuss C, Acklin CJ, O"Rourke R, Buchanan RA, Cossette TL, Rizzo SJS, Soto I, **Carter GW**, Howell GR†. 2019. *Enhancing face validity of mouse models of Alzheimer's disease with natural genetic variation*. PLoS Genetics **15**(5):e1008155.

30. Mukherjee S, Logsdon B, Perumal T, Daily K, Sieberts S, Omberg L, Preuss C, **Carter GW**, Mangravite L. 2019. *Identifying and ranking potential driver genes of Alzheimer's Disease using multi-view evidence aggregation*, Bioinformatics **35**(14):i568-i576, bioRxiv doi.org/10.1101/534305.

31. Fine AD, Ball RL, Fujiwara Y, Handel MA**, Carter GW†**. 2019. *Uncoupling of transcription and cytodifferentiation in mouse spermatocytes with impaired meiosis*, Mol Biol Cell, mbcE18100681.

32. Baker C†, Walker M, Arat S, Ananda G, Petkova P, Powers N, Tian H, Spruce C, Ji B, Rausch D, Choi KB, Petkov P, **Carter GW**, Paigen K†. 2018. *Tissue-specific trans regulation of the mouse epigenome,* Genetics **211**(3):831-845.

33. Menghi F, Barthel FP, Yadav V, Tang M, Ji B, Tang Z, **Carter GW**, Ruan Y, Scully R, Verhaak RGW, Jonkers J, Liu ET†. 2018. *The tandem duplicator phenotype is prevalent in genome-wide cancer configuration driven by distinct genetic mutations*, Cancer Cell **34**:1-14.

34. Wang X, Philip V, Ananda G, White CC, Malhotra A, Michalski P, Karuturi RMK, Chintalapudi SR, Acklin C, Sasner M, Bennett DA, De Jager PL, Howell GR, Carter GW†. 2018. *A Bayesian generalized linear mixed model identifies novel loci for late-onset Alzheimer's disease*, Genetics **209**(1), 51-64.

35. Marnik EA, Wang X, Sproule TJ, Park G, Christianson GJ, Lane-Retiker SK, **Carter GW**, Morse III HC†, Roopenian DC†. 2017. *Precocious Interleukin 21 Expression by CD4 T cells of Naïve Mice Identifies a Novel Stage of T follicular Helper Cell Development in Autoimmune Disease*, Cell Reports, **21**(1):208-221.

36. Wu JW, Preuss C, Wang SP, Yang H, Ji B, **Carter GW**, Gladdy R, Andelfinger G, Mitchell GA†. 2017*. Epistatic interaction between the lipase-encoding genes Pnpla2 and Lipe causes liposarcoma in mice*, PLoS Genetics, **13**(5):1007716.

37. Tyler AL, Ji B, Gatti DM, Munger SC, Churchill GA, Svenson KL, **Carter GW†**. 2017. *Epistatic networks jointly influence phenotypes related to metabolic disease and gene expression in Diversity Outbred mice*, Genetics **206**, 621-639.

38. Ball RL, Fujiwara Y, Sun F, Hu J, Hibbs, M, Handel MA†, **Carter GW†**. 2016. *Regulatory complexity revealed by integrated cytological and RNA-seq analyses of meiotic substages in mouse spermatocytes*, BMC Genomics, **17**:628.

39. Tyler AL, Donahue LR, Churchill GA, **Carter GW†**. 2016. *Weak Epistasis Generally Stabilizes Phenotypes in a Mouse Intercross*, PLoS Genetics, **12**(2): e1005805.

40. Walker M, Billings T, Baker CL, Powers N, Tian H, Saxl RL, Choi K, Hibbs MA, **Carter GW**, Handel MA, Paigen K, Petkov PM†. 2015. *Affinity-seq detects genome-wide PRDM9 binding sites and reveals the impact of prior chromatin modifications on mammalian recombination hotspot usage*, Epigenetics and Chromatin, **8**(1):1-13.

41. Tyler AL, McGarr TC, Beyer BJ, Frankel WN, **Carter GW†**. 2014. *A Genetic Interaction Network Model of a Complex Neurological Disorder*, Genes Brain & Behavior, **13**(8):831-840.

42. Philip VM, Tyler AL, **Carter GW†**. 2014. *Dissection of Complex Gene Expression Using the Combined Analysis of Pleiotropy and Epistasis*, Pac Symp Biocomput., **19**:200-211.

43. Jackson HM, Soto I, Graham LC, **Carter GW**, Howell GR†. 2013. *Clustering of transcriptional profiles identifies changes to insulin signaling as an early event in a mouse model of Alzheimer's disease,* BMC Genomics, **14**(1):831.

44. Tyler AL, Lu W, Hendrick J, Philip V, **Carter GW†**. 2013. *CAPE: An R Package for Combined Analysis of Pleiotropy and Epistasis*, PLoS Computational Biology, **9**(10): e1003270.

45. **Carter GW†**. 2013. *Inferring Gene Function and Network Organization in Drosophila Signaling by Combined Analysis of Pleiotropy and Epistasis*, G3 **3**(5):807-14.

46. Mirzaei H, Knijnenburg T, Kim B, Robinson M, Picotti P, **Carter GW**, Li S, Dilworth D, Eng J, Aitchison J, Shmulevich I, Galitski T, Aebersold R†, and Ranish J†. 2013. *Systematic measurement of transcription factor-DNA interactions by SRM mass spectrometry identifies candidate gene regulatory proteins*, PNAS **110**(9):3645-3650.

47. **Carter GW†**, Hays M, Sherman A, Galitski T. 2012. *Use of Pleiotropy to Model Genetic Interactions in a Population*, PLoS Genetics **8**(10): e1003010.

48. **Carter GW†**, Hays M, Li S, and Galitski T. 2012. *Predicting the Effects of Copy-Number Variation in Double and Triple Mutant Combinations*, Pac Symp Biocomput. **17**:19-30.

49. **Carter GW**, Rush CG, Uygun F, Sakhanenko NA, Galas DJ, and Galitski T. 2010. *A Systems Biology Approach to Modular Genetic Complexity*, Chaos **20**:026102.

50. Galas DJ†, Nykter M, **Carter GW**, Price N, and Shmulevich I. 2010. *Biological Information as Set-Based Complexity,* IEEE Transactions on Information Theory **56**(2):667-677, preprint arXiv:0801.4024.

51. **Carter GW†**, Galas DJ, and Galitski, T. 2009. *Maximal Extraction of Biological Information from Genetic Interaction Data*, PLoS Computational Biology **5**(4):e1000347.

52. **Carter GW†**, Prinz S, Neou C, Shelby JP, Marzolf B, Thorsson V, and Galitski T. 2007 *Prediction of phenotype and genomic expression for combinations of mutations*, Molecular Systems Biology **3**:96.

53. Selinummi J, Niemistö A, Saleem R, **Carter GW**, Aitchison J, Yli-Harja O, Shmulevich I, and Boyle J†. 2007. *A case study on 3-D reconstruction and shape description of perioxisomes in yeast*, Proceedings of the 2007 IEEE International Conference on Signal Processing and Communication (ICSPC 2007) 672-675.

54. **Carter GW**, Rupp S, Fink GR, and Galitski T†. 2006. *Disentangling information flow in the Ras-cAMP signaling network*, Genome Research **16**: 520-526.

55. *Drees BL, *Thorsson V, ***Carter GW**, Rives AW, Raymond M, Avila-Campillo I, Shannon P, and Galitski T†. 2005. *Derivation of genetic interaction networks from quantitative phenotype data* , Genome Biology **6**: R38.

PREPRINTS – Biology

1. Tsai AP, Dong C, Preuss C, Moutinho M, Lin PB-C, Hajicek N, Sondek J, Bissel SJ, Oblak AL, **Carter GW**, Liu Y, Landreth GE, Lamb BT, Nho K†. 2020. *PLGC2 as a Risk Factor for Alzheimer's Disease*, bioRxiv, doi.org/10.1101/2020.05.19.104216.

2. Kuffler L, Skelly DA, Czechanski A, Munger SC, Baker CL, Reinholdt LG, **Carter GW†**. 2022. *Imputation of 3D genome structure by genetic-epigenetic interaction modeling in mice*. bioRxiv, doi.org/10.1101/2022.02.07.479436. In review at *eLife*.

3. Cary GA, Wiley JC, Gockley J, Keegan S, Heath L, Butler III RR, Mangravite LM, Logsdon BA, Longo FM, Levey A, Greenwood AK, **Carter GW†**. 2022. *Genetic and Multi-omic Risk Assessment of Alzheimer's Disease Implicates Core Associated Biological Domains.* medrxiv, doi.org/10.1101/2022.12.15.22283478.

4. Wells AE, Wilson JJ, Sears JD, Wei J, Heuer S, Pandey R, Costa MW, Roopenian DC, Chang C-H, **Carter GW†**. 2023. *Transcriptome Analysis Reveals Organ-Specific Effects of 2-Deoxyglucose Treatment in Healthy Mice*. Submitted and biorxiv, doi.org/10.1101/2023.04.24.537717.

PUBLICATIONS – Biology, Reviews and Book Chapters

1. Rizzo SJS, Homanics G, Schaeffer D, Schaeffer L, Park JE, Olouch J, Zhang T, Haber A, Seyfried N, Paten B, Greenwood A, Murai T, Choi S-H, Huhe Hasi, Koffer J, Strick PL, **Carter GW**, Silva AC. 2023. *Bridging the Rodent to Human Translational Gap: Marmosets as Model Systems for the Study of Alzheimer's Disease*. Perspective, Alzheimer's & Dementia: Translational Research & Clinical Interventions, accepted.

2. Howell GR and Carter GW. 2022. *Molecular and Cellular Mechanisms of Alzheimer's Disease: Animal and Human Studies*, in Neurobiology of Mental Illness, Charney et al., editors, in press.

3. Tyler AL, Emerson J, El Kassaby B, Wells AE, Philip VM, **Carter GW**. 2021. *The Combined Analysis of Pleiotropy and Epistasis (CAPE)*, Methods in Molecular Biology, **2212**:55-67.

4. Tyler AL and **Carter GW**. 2017. *Genetic Interactions Improve Models of Quantitative Traits*, Nature Genetics, **49**(4): 486-488. News and Views.

5. **Carter GW** and Dudley, AM. 2009. *Systems genetics of complex traits*, in Robert, ed., "Encyclopedia of Complexity and Systems Science", Springer, New York, 9105-9124.

6. Killcoyne S, **Carter GW**, Smith J, and Boyle J. 2009. *Cytoscape: A Community-Based Framework for Network Modeling*, Methods Mol Biology **563**: 219-239.

7. **Carter GW**, Thorsson V, and Galitski T. 2007. *Network Modeling of Molecular and Genetic Interactions*, in Conn PM, ed., "Source Book of Models for Biomedical Research", Chapter 9, Humana Press.

8. **Carter GW**. 2005. *Inferring Network Interactions within a Cell*, Briefings in Bioinformatics **6**(4): 380-389.

PUBLICATIONS – Physics

1. Carter GW and Henley EM, *Corrections to the Nuclear Axial Coupling in a Nuclear Medium*, nucl-th/0404037, Int. J. Mod. Phys. E **14** (2005) 1017.

2. Henley EM and Carter GW, g_A *in Nuclei*, in "Proceedings of the 10th International Conference on Nuclear Reaction Mechanisms", Eur. Phys. J. A **24S2** (2005) 103.

3. Carter GW, *Axial Vector Current and Coupling of the Quark in the Instanton Model,* hep-ph/0208250, Phys. Rev. D **67** (2003) 014008.

4. Ostrovsky DM, Carter GW, and Shuryak EV, *Forced Tunneling and Turning State Explosion in Pure Yang-Mills Theory*, hep-ph/0204224, Phys. Rev. D **66** (2002) 036004.

5. Carter GW, Ostrovsky DM, and Shuryak EV, *Instanton-Induced Semi-Hard Parton Interactions and Phenomenology of High Energy Hadron Collisions*, hep-ph/0112036, Phys. Rev. D **65** (2002) 074034.

6. Carter GW, *Color Superconductivity and Blinking Proto-Neutron Stars*, in proceedings of "Compact Stars in the QCD Phase Diagram", hep-ph/0111353, eConf C010815 (2002) 149-154.

7. Carter GW and Prakash M, *The Quenching of the Axial Coupling in Nuclear and Neutron-Star Matter*, nucl-th/0106029, Phys. Lett. **B525** (2002) 249.

8. Carter GW, *Classical Gluon Production in Hadronic Collisions*, in proceedings of the "RIKEN/BNL Workshop on High Energy QCD: Beyond the Pomeron", Guryn W and Kovchegov Yu, Eds., (2001).

9. Carter GW and Shuryak EV, *Do Instantons and Strings Cluster when the Number of Colors is Large?*, hep-ph/0101061, Phys. Lett. **B524** (2002) 297.

10. Carter GW and Reddy S, *Neutrino Propagation in Color Superconducting Quark Matter*, hep-ph/0005228, Phys. Rev. D **62** (2000) 103002.

11. Carter GW and Diakonov D, *The Nonperturbative Color Meissner Effect in a Two-Flavor Color Superconductor*, hep-ph/0001318, Nucl. Phys. **B582** (2000) 571.

12. Carter GW and Diakonov D, *Instanton-Induced Interactions in Finite Density QCD*, hep-ph/9908314, in "Panic 99: Proceedings of the XVth Particles and Nuclei International Conference", Nucl. Phys. **A663** (2000) 741.

13. Carter GW and Diakonov D, *Instanton-Induced Interactions in Finite Density QCD: from Chiral Symmetry Breaking to Colour Superconductivity*, hep-ph/9908314, in "Proceedings of the XIV International Conference on Ultra-Relativistic Nucleus-Nucleus Collisions (Quark Matter 99)", Nucl. Phys. **A661** (1999) 625.

14. Carter GW and Diakonov D, *Chiral Symmetry Breaking and Color Superconductivity in the Instanton Picture*, hep-ph/9905465, in "ECT* International Workshop on Understanding Deconfinement in QCD", Blaschke D, Karsch F, and Roberts CD, Eds. (Singapore, World Scientific, 2000).

15. Carter GW and Jackson AD, *Finding the Pion in the Chiral Random Matrix Vacuum*, hep-ph/9905231, Phys. Rev. D **61** (2000) 077902.

16. Carter GW and Diakonov D, *Light Quarks in the Instanton Vacuum at Finite Baryon Density*, hep-ph/9812445, Phys. Rev. D **60** (1999) 016004.

17. Carter GW, Scavenius O, Mishustin IN, and Ellis PJ, *An Effective Model for Hot Gluodynamics*, nucl-th/9812014, Phys. Rev. C **61** (2000) 045206.

18. Carter GW and Diakonov D, *Symmetry Breaking by Instantons at Finite Density*, in proceedings of the "RIKEN/BNL Workshop on QCD Phase Transitions", Schäfer T and Shuryak EV, Eds. (1998).

19. Carter GW and Diakonov D, *Towards a Theory of Instantons at Nonzero Fermion Density*, hep-ph/9807219, Nucl. Phys. **A642** (1998) 78.

20. Carter GW and Ellis PJ, *An Effective Lagrangian with Broken Scale and Chiral Symmetry IV: Nucleons and Mesons at Finite Temperature*, nucl-th/9707051, Nucl. Phys. **A628** (1998) 325.

21. Carter GW, Ellis PJ, and Rudaz S, *An Effective Lagrangian with Broken Scale and Chiral Symmetry III: Mesons at Finite Temperature*, nucl-th/9612043, Nucl. Phys. **A618** (1997) 317.

22. Carter GW, Ellis PJ, and Rudaz S, *An Effective Lagrangian with Broken Scale and Chiral Symmetry II: Pion Phenomenology*, nucl-th/9512033, Nucl. Phys. **A603** (1996) 367; erratum **A608** (1996) 514.

EDUCATION AND MENTORING

Postdoctoral Mentoring

Dr. Yi Juin Liew, 2023-present.
Dr. Tamar Abel, 2023-present.
Dr. Stanley Yang, 2020-2021. Bioinformatics Scientist at Dana Farber Cancer Institute.
Dr. Rawan Olayan, 2018-2021. Bioinformatics Analyst at Harvard FAS.

Dr. Ann Wells, 2018-present.
Dr. Ravi Pandey, 2017-2021. Promoted to Bioinformatics Analyst II.
Dr. Seda Arat, 2015-2019. Senior Computational Toxicologist at Pfizer.
Dr. Xulong Wang, 2013-2016. Senior Manager at Karyopharm Therapeutics.
Dr. Bo Ji, 2013-2017. Scientist at Washington University in St. Louis.
Dr. Anna L. Tyler, 2012-2016. Promoted to Associate Research Scientist (2016) and Research Scientist (2019).
Dr. Robert Valenzuela, 2012. Rehired as Bioinformatics Analyst III (2022).

Graduate Student Advising

Sonal Kumar, Tufts University, Neuroscience, 2023-present.
Lauren Kuffler, Tufts University, Genetics, 2018-present.
Alexander Fine, Tufts University, Genetics, 2014-2019. Scientist I, Foundation Medicine.

Other Student Mentoring

Hannah Megathlin, University of Maine (rotation), 2023.
Megan Mathews, Saddleback College (summer student), 2022.
Laura Drepanos, Colby College (academic intern) 2022.
Zoe Vittum, University of Maine (academic intern) 2021.
Alexander Daines, University of Michigan (summer student), 2021.
Alexis Garretson, Tufts University (rotation), 2020.
Peter Benson, Mount Desert High School (internship), 2019-2020.
Nikhil Milind, North Carolina State University (summer student, internship), 2018, 2019.
Joshua Mincer, Rensselaer Polytechnic Institute, NY (summer student), 2019.
Meredith Mayer, Delaware Valley University, PA (summer student), 2019.
Sarah Shapley, Baldwin Wallace University (summer student), 2018.
Madelyn Adams, Falmouth High School, Falmouth, ME (summer student), 2017.
Catrina Spruce, University of Maine (MSc), 2015-2016.
Arya Royal, Lafayette High School, Wildwood, MO, (summer student), 2016.
Julia Huesa, North Carolina School of Science and Math (summer student), 2016.
Wendy Pitman, Johns Hopkins University (MSc), 2015.
Reanna Dona, The Ohio State University (summer student), 2015.
Cai John, University of Edinburgh (internship), 2015.
Kristoph Naggert, Mount Desert High School (internship), 2015-2016.
Eraj Khokhar, University of Maine (rotation), 2015.
Tian-shun Allan Jiang, North Carolina School of Science and Math (summer student), 2014.
Xiaojie Ji, University of Maine (rotation), 2014.
Justin Hendrick, Cornell University (internship), 2013.
Patrick Kane, North Carolina School of Science and Math (summer student), 2013.
Wei Lu, Duke University (internship), 2012.
Justin Hendrick, North Carolina School of Science and Math (summer student), 2012.
Mehmet Umut Caglar, Texas Tech University (visiting graduate student), 2012.
Leonard Tan, Tufts University (rotation), 2011.
Yang Zhang, New Mexico State University (visiting graduate student), 2011.
Kavya Sekar, University of North Carolina (summer student), 2011.
Sangeetha Kumar, North Carolina School of Science and Math (summer student), 2011.
Gokcen Cilingir and Dake Sun (software engineers), 2009-2010.
Cynthia Rush, UNC (summer student), 2009.
Adam Waite, University of Washington (rotation), 2008.
Gina Fridley, MIT (summer student), 2008.
Aaron Brooks, University of Washington (rotation), 2008.

Teaching

Graduate Course, Foundations of Computational Biology, Tufts University (CMDB 0320) and University of Maine (BMS625), 2016-2018.

Introduction to NIH Fellowship Applications for PhD Students, Tufts University, 2021-present.

Tufts Neuroscience Boot Camp, 2020-present.

Short Course on Principles and Techniques for Improving Preclinical Translation in Alzheimer's Disease, The Jackson Laboratory, 2017-present.

The Cube Lecture Series, The Jackson Laboratory, 2020.

Short Course on 21st Century Mouse Genetics, The Jackson Laboratory, 2016-present.

Short Course on Big Data for Professors, The Jackson Laboratory, 2016-present.

Graduate Course on Mammalian Genetics, Tufts University, 2012-present.

Short Course on Experimental Models of Human Cancer, The Jackson Laboratory, 2018.

Short Course on Neurogenetic Tools, The Jackson Laboratory, 2017- 2018.

Short Course on Systems Genetics, The Jackson Laboratory, 2010-2016.

Graduate Course on Biological Pathways, University of Maine, 2012-2014.

Introduction to Systems Biology Course, Institute for Systems Biology, 2007-2009.

Computational Biology for summer students, Institute for Systems Biology, 2007-2009.

Electrodynamics, U of Washington, 2002-2003.

Introductory Physics, Stony Brook U and U of Minnesota, 1993-2001.

Educational Software Engineer

Case Western Reserve University, Department of Physics, 1991-1993.

PROFESSIONAL SERVICE

Grant Review

Alzheimer's Association, 2022, 2023.

NIGMS Maximizing Investigators' Research Award (MIRA) for Early Stage Investigators (R35), 2020, 2022

NIA Special Emphasis Panel, 2021, 2022

NIH Synapses, Cytoskeleton, and Trafficking (SYN), 2020

NIH Genes, Genetics, and Genomes Fellowship (F08), 2018, 2019, 2020, 2023

NIH Special Emphasis Panel, 2019

NIH Cellular and Molecular Biology of Neurodegeneration, 2018, 2019

Netherlands Organisation for Health Research and Development (ZonMw), 2018

Pennsylvania Department of Health Study Section, 2015

NIH/NIGMS SCORE Study Section, 2012

NCI Advanced In Vivo Imaging to Understand Cancer Systems, 2011

Outreach

New England Council: Investments and Developments in Neuroscience with US Senator Edward Markey, Boston, MA, 24 October 2022

Round Table on Alzheimer's with US Representative Jared Golden, Lewiston, ME, 4 September 2019

The Nature of Forgetting Panel Discussion, Collins Center for the Arts, Orono, ME, 30 October 2018

Wellspring Speaker Series, The Osborn, Rye, NY, 23 October 2018

Round Table Discussion on Alzheimer's with US Senator Angus King, Bangor, ME, 8 June 2018

Speaker at the Cumberland Club, Portland, ME, 28 May 2018

Blue Hill Forum, Parker Ridge, Blue Hill, ME, 9 February 2018

Society Memberships

Genetics Society of America, International Society of Computational Biology, International Mammalian Genome Society, Human Genome Organization, International Society to Advance Alzheimer's Research and Treatment, International Behavioral and Neural Genetics Society, Society for Neuroscience.