

CURRICULUM VITAE

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Education

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| 2019-present | <p>Post-Doctoral Fellow, Epigenetics Institute, Perelman School of Medicine, University of Pennsylvania
 Project: Mechanisms that regulate gene expression with a special emphasis on how the DNA-packaging structure of chromatin is manipulated during genomic processes in ant societies.
 Mentor: Dr. Shelley Berger</p> |
| 2013-2019 | <p>Geisel School of Medicine at Dartmouth, Hanover, NH, Molecular and Cellular Biology Graduate Program, PhD in Molecular and Systems Biology.
 <i>Dissertation title:</i> Elucidating genes, circuits and behavior in a novel Drosophila social learning and memory paradigm.
 Mentor: Dr. Giovanni Bosco</p> |
| 2012 | <p>Emory University, Atlanta, GA, M.S., Biology. M.S. defense in Spring 2012.
 <i>Dissertation title:</i> The anti-wasp immune response across the genus Drosophila.
 Mentor(s): Dr. Todd Schlenke and Dr. Nathan T. Mortimer</p> |
| 2012 | <p>Emory University, Atlanta, GA, B.S., Biology
 <i>Project:</i> The anti-wasp immune response across the genus Drosophila.
 Mentor(s): Dr. Todd Schlenke and Dr. Nathan T. Mortimer</p> |

Research Positions

June 2019-Present	Post-Doctoral Fellow, University of Pennsylvania, Dr. Shelley Berger
August 2013-June 2019	Graduate student, Dartmouth College, Dr. Giovanni Bosco
April 2013-August 2013	Lead Research Assistant, Dartmouth College, Dr. Giovanni Bosco
May 2012-April 2013	Lead Research Specialist, Emory University, Dr. Todd Schlenke and Dr. Nathan T. Mortimer
January 2009-May 2012	Undergraduate Research Assistant, Emory University, Dr. Todd Schlenke and Dr. Nathan T. Mortimer

Awards and Honors

2020	Early Career Scientist, Genetics Society of America
2020	Larry Sandler Memorial Award, (best <i>Drosophila</i> PhD thesis), award by Genetics Society of America
2019	PLOS Genetics Research Prize, Winning Article, PLOS Genetics
2019	Hannah Croasdale Graduate Scholar Award for Academic Excellence presented by the Guarini School of Graduate and Advanced Studies at Dartmouth
2019	<i>Drosophila</i> Image Award, Honorable Mention: 60th Annual <i>Drosophila</i> Research Conference, Dallas, TX., awarded by the Genetics Society of America
2019	DeLill Nasser Award for Professional Development in Genetics, awarded by the Genetics Society of America
2015	Best Poster (First Place). 1 st Annual Celebration of Biomedical Research at Dartmouth (CBRaD).
2013	Best Graduate Student Poster (Third Place): Trans-generational medication in <i>Drosophila sechellia</i> . 54th Annual <i>Drosophila</i> Research Conference, Washington D.C.
2012	Best Undergraduate Poster (Second Place): High hemocyte load is associated with increased resistance against parasitoids in <i>Drosophila sukuzii</i> , a relative of <i>D. melanogaster</i> . 53rd Annual <i>Drosophila</i> Research Conference, Chicago, IL.
2010	Presidential Bronze Medal for Community Service
2010	Best Poster at Undergraduate Poster Symposium, Emory University

Contributions to science

Learning, memory and social behavior

As a graduate student at the Geisel School of Medicine at Dartmouth College, under the mentorship of Dr. Giovanni Bosco, my primary studies were on learning, memory, and social behavior in *Drosophila melanogaster* (the fruit fly). For learning and memory, we utilized an ecologically relevant stimulus (a predatory wasp), to elicit a non-associative memory, that we analyzed for decay following exposure across time. Using this assay, we find an age dependent decline of memory maintenance. For social behaviors, we find that flies exposed to predators engage in social interactions whereby naive flies learn and remember as if they had seen the predator. We have proposed that this social

behavior constitutes a fly “language” and have observed both intraspecies and interspecies communication to exist throughout the genus *Drosophila*. The following publications during my graduate school tenure (2013-present) detail these findings, in addition to other collaborative projects.

- 2019 N Zhou, Y Jiang, TR Bergquist, AJ Lee, **BZ Kacsoh**, AW Crocker, KA Lewis, G Georghiou, HN Nguyen, MN Hamid, L Davis, The Critical Assessment of Function Annotation, B Rost, SE Brenner, CA Orengo, CJ Jeffery, G Bosco, DA Hogan, MJ Martin, C O'Donovan, SD Mooney, CS Greene, P Radivojac, I Friedberg (2019) The CAFA challenge reports improved protein function prediction and new functional annotations for hundreds of genes through experimental screens. *Genome Biology*. doi: doi.org/10.1186/s13059-019-1835-8. PMID:
- 2019 Bozler J, **Kacsoh BZ**, Bosco G (2019) Maternal Priming of Offspring Immune System in *Drosophila*. *G3: Genes, Genomes, Genetics*. doi: doi.org/10.1534/g3.119.400852. PMID:
- 2019 **Kacsoh BZ**, Bozler J, Hodge S, Bosco G (2019) The neural circuitry of learning dialects in a *Drosophila* language. *Communications Biology*. doi: doi.org/10.1038/s42003-019-0557-5. PMID: [31428697](https://pubmed.ncbi.nlm.nih.gov/31428697/)
- 2019 Bozler J, **Kacsoh BZ**, Bosco G (2019) Transgenerational inheritance of ethanol preference is caused by maternal NPF repression *eLife*. doi: doi.org/10.7554/eLife.45391. PMID: [31287057](https://pubmed.ncbi.nlm.nih.gov/31287057/)
- 2019 **Kacsoh BZ**, Barton S, Jiang Y, Mooney SD, Friedberg I, Radivojac P, Greene CS, Bosco G (2018) New *Drosophila* long-term memory genes revealed by assessing computational function prediction methods. *G3: Genes, Genomes, Genetics*. doi: doi.org/10.1534/g3.118.200867. PMID: [30463884](https://pubmed.ncbi.nlm.nih.gov/30463884/)
- 2018 **Kacsoh BZ**, Bozler J, Bosco G (2018) *Drosophila* species learn dialects through communal living. *Plos Genetics*. doi.org/10.1371/journal.pgen.1007430. PMID: [30024883](https://pubmed.ncbi.nlm.nih.gov/30024883/)
- Preview:* Manak JR (2018) Multiculturalism is good for flies, too. *Plos Genetics*. doi.org/10.1371/journal.pgen.1007480
- 2017 Bozler J, **Kacsoh BZ**, Bosco G (2017) Nematocytes: Discovery and characterization of a novel anculeate hemocyte in *Drosophila falleni* and *Drosophila phalerata*. *Plos One*. doi.org/10.1371/journal.pone.0188133. PMID: [29141015](https://pubmed.ncbi.nlm.nih.gov/29141015/)
- 2017 Bozler J*, **Kacsoh BZ***, Chen H, Theurkauf WE, Weng Z, Bosco G (2017) A systems level approach to temporal expression dynamics in *Drosophila* reveals clusters of long term memory genes. *Plos Genetics*. doi.org/10.1371/journal.pgen.1007054. PMID: [29084214](https://pubmed.ncbi.nlm.nih.gov/29084214/)
- 2017 **Kacsoh BZ**, Greene CS, Bosco G (2017) Machine Learning Analysis Identifies *Drosophila* Grunge/Atrophin as an Important Learning and Memory Gene Required for Memory Retention and Social Learning. *G3: Genes, Genomes, Genetics*. doi.org/10.1534/g3.117.300172 . PMID: [28889104](https://pubmed.ncbi.nlm.nih.gov/28889104/)
- 2016 Allaway RJ, Fischer DA, de Abreu FB, Gardner TB, Gordon SR, Barth RJ, Colacchio TA, Wood M, **Kacsoh BZ**, Bouley SJ, Cui J, Hamilton J, Choi JA,

Lange JT, Peterson JD, Padmanabhan V, Tomlinson CR, Tsongalis GJ, Suriawinata A, Greene CS, Sanchez Y, Smith KD (2016) Genomic characterization of patient-derived xenograft models established from fine needle aspirate biopsies of a primary pancreatic ductal adenocarcinoma and from patient-matched metastatic sites. *Oncotarget*. 7(13):17087-102. doi: [10.18632/oncotarget.7718](https://doi.org/10.18632/oncotarget.7718). PMID: [26934555](https://pubmed.ncbi.nlm.nih.gov/26934555/)

2015 **Kacsoh BZ***, Bozler J*, Ramaswami M, Bosco G (2015) Social communication of predator-induced changes in *Drosophila* behavior and germ line physiology. *eLife*. May 13, 2015. doi.org/10.7554/eLife.07423. PMID: [25970035](https://pubmed.ncbi.nlm.nih.gov/25970035/)

2015 **Kacsoh BZ**, Bozler J, Hodge S, Ramaswami M, Bosco G (2015) Non-Associative Long-Term Memory Formation in *Drosophila* Requires Mushroom Body Specific Functions to Maintain Predator-Induced Changes in Oviposition Behavior. *Genetics*. April 1, 2015 vol. 199 no. 4 1143-1157, doi:10.1534/genetics.114.172221. PMID: [25633088](https://pubmed.ncbi.nlm.nih.gov/25633088/)

Innate and behavioral immunity

As an undergraduate student at Emory University, under the mentorship of Dr. Nathan Mortimer and Todd Schlenke, I studied the physiological and behavioral immune response of *Drosophila melanogaster* (fruit fly) and other Drosophilids in the genus *Drosophila* in response to predatory wasps. We uncovered physiological mechanisms of *Drosophila* larvae allowing successful immune responses in addition to uncovering novel wasp venom components. We also uncovered multiple unique behavioral responses of adult *Drosophila* to the predatory wasps. The following 7 publications during my undergraduate tenure detail these studies.

2014 **Kacsoh BZ**, Bozler J, Schlenke TA (2014) A role for nematocytes in the cellular immune response of the Drosophilid *Zaprionus indianus*. *Parasitology*. Apr;141(5):697-715. doi: [10.1017/S0031182013001431](https://doi.org/10.1017/S0031182013001431). PMID: [24476764](https://pubmed.ncbi.nlm.nih.gov/24476764/)

2013 Mortimer NT, Goecks J, **Kacsoh BZ**, Mobley JA, Bowersock GJ, Taylor J, Schlenke TA (2013) Parasitoid wasp venom SERCA regulates *Drosophila* calcium levels and inhibits cellular immunity. *PNAS* 110, doi: [9427-9432](https://doi.org/9427-9432) [10.1073/pnas.1222351110](https://doi.org/10.1073/pnas.1222351110). PMID: [23690612](https://pubmed.ncbi.nlm.nih.gov/23690612/)

2013 **Kacsoh BZ**, Lynch ZR, Mortimer NT, Schlenke TA (2013) Fruit Flies Medicate Offspring After Seeing Parasites. *Science*, 2013; 339 (6122): 947 doi: [10.1126/science.1229625](https://doi.org/10.1126/science.1229625). PMID: [23430653](https://pubmed.ncbi.nlm.nih.gov/23430653/)

2012 **Kacsoh BZ**, Schlenke TA (2012) High hemocyte load is associated with increased resistance against parasitoids in *Drosophila suzukii*, a relative of *D. melanogaster*. *PLoS One* 7:e34721. doi: [10.1371/journal.pone.0034721](https://doi.org/10.1371/journal.pone.0034721). PMID: [22529929](https://pubmed.ncbi.nlm.nih.gov/22529929/)

2012 Milan N*, **Kacsoh BZ***, Schlenke TA (2012) Alcohol consumption as self-medication against blood-borne parasites in the fruitfly. *Current Biology* 22:488-493. doi: [10.1016/j.cub.2012.01.045](https://doi.org/10.1016/j.cub.2012.01.045). PMID: [22342747](https://pubmed.ncbi.nlm.nih.gov/22342747/)

2012 Mortimer NT, **Kacsoh BZ**, Keebaugh ES, Schlenke TA (2012) *Mgat1*-dependent N-glycosylation of membrane components primes *Drosophila melanogaster* blood cells for the cellular encapsulation response. *PLoS Pathogens*. 8:e1002819. doi: [10.1371/journal.ppat.1002819](https://doi.org/10.1371/journal.ppat.1002819). PMID: [22829770](https://pubmed.ncbi.nlm.nih.gov/22829770/)

2012 Lefèvre T, de Roode JC, **Kacsoh BZ**, Schlenke TA (2012) Defence strategies against a parasitoid wasp in *Drosophila*: fight or flight? *Biol Lett.* 8(2):230-3. Epub 2011 Aug 24. doi: [10.1098/rsbl.2011.0725](https://doi.org/10.1098/rsbl.2011.0725). PMID: [21865240](https://pubmed.ncbi.nlm.nih.gov/21865240/)

*Indicates co-first authorship

Complete List of 15 Published Works in [MyBibliography](#) on NCBI and [Google Scholar](#).

	All	Since 2014
Citations	501	433
h-index	10	10
i10-index	10	10

Manuscripts in Preparation

2020 Mortimer NT, Fischer M, Waring AL, Ranganath PK, **Kacsoh BZ**, Brantley S, Hill J, Lark C, Martin J, Baines P, Vrailas-Mortimer AD, Schlenke TA (2020) Extracellular matrix protein N-glycosylation mediates immune self-tolerance in *Drosophila melanogaster* (submitted to *Cell*)

2020 **Kacsoh BZ**, Bozler J, Hodge S, Bosco G (2019) Age dependent decline of non-associative long-term memory is dependent on FMR and PTEN function in addition to mushroom body morphology. (*submitted to GENETICS*)

2020 **Kacsoh BZ**, Nguyen HQ, Bosco G (2019) The Condensin II subunit Cap-H2 acts as a mediator of hybrid dysgenesis. (*submitted to G3*)

2020 **Kacsoh BZ**, Bosco G (2019) *Drosophila* as an emerging model for social behavior and social structure. (*in review at Genetics*)

2020 **Kacsoh BZ**, Sadanandappa MK, Ramaswami M, Bosco G (2019) Synapsin serves as a memory extinction gene in *Drosophila*. (*in preparation*)

Abstracts and Presentations

2019* June—**Kacsoh BZ**. GSA Early Career Scientist Seminar Series, presented by the Genetics Society of America. The neural circuitry of learning dialects in *Drosophila* species.

2019 April—**Kacsoh BZ**, Bozler J, Hodge S, Bosco G. The neural circuitry of learning dialects in *Drosophila* species. 60th Annual *Drosophila* Research Conference, Dallas, TX.

2018 April—**Kacsoh BZ**, Bozler J, Bosco G. *Drosophila* species learn dialects through communal living. 59th Annual *Drosophila* Research Conference, Philadelphia, PA.

2017* October—**Kacsoh BZ**, Greene CS, Bosco G. Machine Learning Analysis Identifies *Drosophila* Grunge/Atrophin as an Important Learning and Memory Gene Required for Memory Retention and Social Learning. Symposium on Biomathematics and Ecology, Education and Research. Normal, Illinois.

- 2016 May— **Kacsoh BZ**, Bozler J, Hodge S, Bosco G. Influences of age on non-associative long-term memory and learning in *Drosophila* Chromatin, Epigenetics & Transcription. Cold Spring Harbor, Asia. Suzhou, China
- 2013 April—**Kacsoh BZ**, Bozler J, Schlenke TA. A role for nematocytes in the cellular immune response of the Drosophilid *Zaprionus indianus* 54th Annual Drosophila Research Conference, Washington D.C.
- 2013 April—**Kacsoh BZ**, Lynch ZR, Mortimer NT, Schlenke TA. Trans-generational medication in *Drosophila sechellia* 54th Annual Drosophila Research Conference, Washington D.C.
- 2012 March—**Kacsoh, BZ** and Schlenke, TA. High hemocyte load is associated with increased resistance against parasitoids in *Drosophila suzukii*, a relative of *D. melanogaster* 53rd Annual Drosophila Research Conference, Chicago, IL.
- 2012 March—**Kacsoh, BZ** and Schlenke, TA. The anti-wasp immune response across the genus *Drosophila*. 53rd Annual Drosophila Research Conference, Chicago, IL.
- 2010 April—**Kacsoh, BZ** and Schlenke, TA. Evolutionary Patterns in immune responses of *Drosophila* in Parasitic Wasp Interactions Undergraduate Symposium, Emory, GA.

* denotes invited talk

Workshops & Career Development

- 2019 60th Annual Drosophila Research Conference, Dallas, TX.
- 2018 59th Annual Drosophila Research Conference, Philadelphia, PA.
- 2017 Symposium on Biomathematics and Ecology, Education and Research. Normal, Illinois.
- 2016 Chromatin, Epigenetics & Transcription. Cold Spring Harbor, Asia. Suzhou, China
- 2013 54th Annual Drosophila Research Conference, Washington D.C.
- 2012 Drosophila Species Workshop, UCSD, CA.
- 2012 53rd Annual Drosophila Research Conference, Chicago, IL.

Reviewer: eLife, BMC Genomics, Communications Biology, PlosOne

Professional Societies

Genetics Society of America (2012-present)

Out reach

Present Penn Academy for Reproductive Sciences ([PARS](#)) program
Present [SPARK](#) program
Present Skype-a-Scientist