

Kyle Tretina, Ph.D.
Genomics Application Scientist
Meenta, Inc.

Date November 18th, 2020

Contact Information

Business Address:

Meenta Inc.

2nd floor, 55 Court St., Boston MA 02203

Email: kyle@meenta.io

Education

2007-2011 B.Sc. Interdisciplinary Studies: Biotechnology, Wheaton College.

2012–2016 Ph.D., Molecular Microbiology and Immunology, University of Maryland,
Mentor: Joana C. Silva, Thesis title: “*Theileria parva* genomics,
transcriptomics, and host-pathogen interactions”, Baltimore, MD, USA.

Experience

2003-2006 Student Intern, Coriell Cell Repositories, Stem Cell Laboratory, Research
Topic: “Efficiency of Epstein-Barr virus transformation”, PI: Karen
Fecenko-Tacka, Camden, NJ, USA.

2009-2011 Student Intern, Wheaton College, Biology Department, Functionality of
Research Topic: “Predicting function in non-coding DNA on human
chromosome 16”, PI: Pattle Pun, Wheaton, IL, USA.

2011-2012 Research Technologist, University of Chicago, Department of Medicine,
Hematology/Oncology Section, Research Topic: “Regulatory T cells and
Transplant Immunobiology”, PI: Vu Nguyen, Chicago, IL, USA.

2013-2017 Graduate Research Assistant, University of Maryland, Baltimore,
Research Topic: “*Theileria parva* genomics, transcriptomics, and
host-pathogen interactions”, PI: Joana C. Silva, Baltimore, MD, USA.

2017-2020 Postdoctoral Associate, Yale University, Research Topic:
“Cell-autonomous immunity to parasites”, PI: John D. MacMicking, New
Haven, CT, USA.

2020-present Genomics Application Scientist, Meenta Inc., Research Topic: “Machine Learning in Genomics”, PI: Stephan Smith, Boston, MA, USA.

Honors/Awards

- 2015-2016 University of Maryland, Immunity and Infection T32 training grant (NIH/NIAID T32 AI007540-14; <http://grantome.com/grant/NIH/T32-AI007540-16>), PI: Dr. James Kaper.
- 2015 Ph.D. Scholar Award Nominee, by the Program in Molecular Microbiology and Immunology, created to recognize “an outstanding academic performance record and show great potential as a scientist”.
- 2015 J. Howard Brown Award, by the Maryland Branch of the American Society for Microbiology, for “an outstanding graduate student who is making a contribution worthy of recognition in the field of microbiology”.
- 2016 STEM Chateaubriand Fellowship Awardee, offered by the Embassy of France in the United States (www.chateaubriand-fellowship.org). Declined in order to pursue other research opportunities.
- 2016 Otani Memorial Award Nominee, by the Program in Molecular Microbiology and Immunology, given to “a graduate student in GPILS of outstanding character who demonstrates superior academic performance and who shows outstanding promise as an independent investigator”.
- 2018 Travel award for the NGS & Clinical Diagnostics Congress in Boston, MA, USA

Professional Society Memberships

- 2013-present The American Society of Tropical Medicine and Hygiene
- 2013-present American Society of Microbiology
- 2017-2020 Future Leaders of Yale

Journal Reviews

- 2017- present *MDPI Pathogens*
- 2018-present *Nature Communications Biology, Cellular Microbiology*
- 2020-present *MDPI Vaccines (Reviewer Board)*

Graduate Training

- 2013 Programming Workshop, Institute for Genome Sciences, University of Maryland School of Medicine, Baltimore, MD, USA.
- 2013 UMB GPILS Summer Bridge Course, University of Maryland School of Medicine, Baltimore, MD, USA.
- 2014 Introduction to Genomics & Bioinformatics Workshop, Institute for Genome Sciences, University of Maryland School of Medicine, Baltimore, MD, USA.

Institutional Service/Activities

- 2013-2016 Writer, *Microscoop*, University of Maryland, Baltimore, the Molecular Microbiology and Immunology department semi-annual newsletter
- 2013-2016 Volunteer and tour guide, University of Maryland, Baltimore, Molecular Microbiology and Immunology Ph.D. program recruitment activities
- 2013-2016 Journal club attendance and presentations: Immunology Journal Club, Microbial Pathogenesis Journal Club, Molecular Evolutionary Genetics Journal Club, Student Research Seminar Series, and Molecular Microbiology and Immunology Program Student Seminar
- 2014-2016 Organizer, summer student research forum, University of Maryland, Baltimore, hosted by the Office of Student Research
- 2015-2016 Interviewer/Editor, *Beyond the Abstract*, University of Maryland, Baltimore, student-led podcast
- 2015-2016 Chair, Parasitology Student-Selected Speaker Committee
- 2015 Invited interviewee, *Beyond the Abstract* University of Maryland, Baltimore, to discuss research
- 2016 Coordinator, Annual Graduate Research Symposium, Molecular Microbiology and Immunology Program, University of Maryland, Baltimore
- 2016 Invited Program Representative, University of Maryland Master Plan Meeting, to discuss the next 10 years of campus facilities development
- 2016 Committee member, Qualifying Exam Preparation, Molecular Microbiology and Immunology Ph.D. program, University of Maryland, Baltimore
- 2018 Mentorship workshop with the Yale University Center for Teaching and Learning
- 2018-2019 Mentorship seminar series with Howard Hughes Medical Institute EXROP program
- 2019 Yale postdoc podcast with the Professional Development Committee of the Yale Postdoctoral Association in collaboration with the Association of Yale Alumni

- 2018-2019 Journal club membership and/or presentations: Human Translational Immunology, Microbial Pathogenesis
- 2019-2020 Yale Postdoctoral Association Career Development Committee and Communication Committee

Local and National Service

Local Service

- 2012 Team member, *Bioblast!*, University of Maryland, Baltimore, a program at the Institute for Genome Sciences to encourage middle school children to pursue careers in science
- 2012 Team member, *Starlight*, a program to give kids with cancer a special day at the movies
- 2015 Invited panel member (Institute for Genome Sciences student representative), Student Research Symposium, Glen Burnie High School
- 2015 Volunteer Staff, *Mini-MedSchool*, University of Maryland, Baltimore, summer camp for local community K-12 kids
- 2016 Invited Panel Member, STEM program *Careers in Science* discussion, Baltimore Middle School
- 2018-2020 Monthly volunteer at Life Haven homeless shelter, New Haven
- 2018-2020 Volunteer at local high school developing immunology curriculum

Teaching service

Postdoc Mentoring

- 2017-2018 Research fellow mentor to Sofia Braunstein, a fourth-year undergraduate student at Yale University, CT. Training topics: parasite biology, cell culturing, molecular biology, cloning.
- 2017-2020 Research fellow mentor to Matteo Risati, a second-year undergraduate student at Yale University, CT. Training topics: parasite biology, CRISPR/Cas9 technology, immunofluorescence image analysis, bioinformatics, phylogenetics.
- 2018-2019 Postdoc mentor to Sarah Sudlow, from her junior to senior year as an Howard Hughes Medical Institute-funded undergraduate student through the EXROP program. Training topics: molecular biology, cell culturing, parasitology.
- 2019-2020 Postdoc mentor to Ana Berthel, graduate student in the Yale Computational Biology and Bioinformatics program. Training topics: evolutionary biology, bioinformatics, computational immunology.

Research Fellow Mentoring

2016-2017 Research fellow mentor to Nicholas Palmateer, a graduate student at the University of Maryland, Baltimore. Training topics: molecular evolution, genome diversity analyses, bioinformatics, sequence alignment.

Graduate Student Mentoring

2013 Graduate student mentor to Bilal Iqbal, fourth-year student at the University of Maryland Baltimore County, Baltimore, MD, USA. Training topics: gene structure annotation, gene prediction validation,

2015-2016 Graduate student mentor to Jamal El Badaoui, second-year student at Baltimore City Community College, Baltimore, MD, USA. Training topics: molecular biology and gene polymorphism in parasite DNA samples, including PCR, direct sequencing and sequence data interpretation.

2016-2017 Graduate student mentor to Saqlain Amin, Senior at the University of Maryland Baltimore County, Baltimore, MD, USA. Training topics: bioinformatics of whole-genome annotation, sequence alignment, Markov model protein domain prediction.

2016-2017 Graduate student mentor to Nicholas Palmateer, second-year graduate student in the Molecular Medicine Ph.D. program at the University of Maryland, Baltimore, MD, USA. Training topics: *Theileria parva* population genomics and bioinformatics.

Undergraduate Student Mentoring

2010 Teacher's Assistant for Microbiology and Immunology class, Biology Department, Wheaton College, Wheaton, IL, USA. Teacher: Dr. Pattle P. Pun.

Publications

Peer-reviewed Journal Articles

1. Snedecker J*, **Tretina K***, Triplet M, Lee D, Poirier A, Pun P, Hayward J, Leung R, Tsui S. "Analysis of the Positively and Non-Positively Selected Non-Protein Coding Sequences of Human Chromosome 16." *Journal of Biology, Biological Systems and Bioinformatics*, 2013, 4(1):1-14.
2. Norling M, Bishop RP, Pelle R, Qi W, Henson S, Drábek E, **Tretina K**, Odongo D, Mwaura S, Njoroge T, Bongcam-Rudloff E, Daubenberger CA, Silva JC. "The genomes of three stocks comprising the most widely utilized live sporozoite *Theileria parva* vaccine exhibit very different degrees and patterns of sequence divergence." *BMC Genomics*, 2015, 24(16):729.

3. **Tretina K**, Gotia HT, Mann DJ, Silva JC. "*Theileria*-transformed bovine leukocytes have cancer hallmarks." Review. *Trends in Parasitology*, 2015, 31(7):306-14.
4. **Tretina K**, Pelle R, Silva JC, "Cis regulatory motifs and antisense transcriptional control in the apicomplexan *Theileria parva*." *BMC Genomics*, 2016, 17(1):128.
5. Silva JC, Cornillot E, McCracken C, Usmani-Brown S, Dwivedi A, Ifeonu OO, Crabtree J, Gotia HT, Reynes C, Colinge J, Kumar V, Garg A, Lawres L, Pablo J, Hung C, Brancato J, Kumari P, Orvis J, Su Q, **Tretina K**, Shetty A, Chibucos M, Ott S, Sadzewicz L, Sengamalay N, Tallon L, Fraser CM, Frutos R, Molina DM, Krause PJ, Mamoun CB, "Genome-wide diversity and gene expression profiling of *Babesia microti* isolates identify polymorphic genes that mediate host-pathogen interactions". *Scientific Reports*, 2016, Oct 18;6:35284. doi: 10.1038/srep35284.
6. Nyagwange J, Tijhaar E, Ternette N, Mobegi F, **Tretina K**, Silva JC, Pelle R, Nene V. "Characterization of the *Theileria parva* sporozoite proteome." *Int J Parasitol*. 2017 Dec 16. pii: S0020-7519(17)30345-4. doi: 10.1016/j.ijpara.2017.09.007.
7. Liu, C, Frank DN, Horch M, Chau S, Ir D, Horch EA, **Tretina K**, Van Besien K, Lozupone CA, Nguyen VH. "Associations between acute gastrointestinal GvHD and the baseline gut microbiota of allogeneic hematopoietic stem cell transplant recipients and donors." *Nature Bone Marrow Transplantation*, 2017 52(12):1643-1650.
8. Knowles, DP, Kappmeyer LS, Haney D, Herndon DR, Fry LM, Munro JB, Sears K, Ueti MW, Wise LN, Silva M, Schneider DA, Grause J, White SN, **Tretina K**, Bishop RP, Odongo DO, Pelzel-McCluskey AM, Scoles GA, Mealey RH, Silva JC. "Discovery of a novel species, *Theileria haneyi* n. sp., infective to equids, highlights exceptional genomic diversity within the genus *Theileria* : implications for apicomplexan parasite surveillance." *International Journal for Parasitology*, 2018, <https://doi.org/10.1016/j.ijpara.2018.03.010>.
9. **Tretina K**, Park ES, Maminska A, MacMicking JD. "Interferon-induced guanylate-binding proteins: Guardians of host defense in health and disease." *Journal of Experimental Medicine*, 2019 Mar 4;216(3):482-500. doi: 10.1084/jem.20182031.

10. **Tretina K**, Pelle R, Orvis J, Gotia HT, Ifeonu OO, Kumari P, Palmateer NC, Iqbal SBA, Fry LM, Nene VM, Daubenberger CA, Bishop RP, Silva JC. Re-annotation of the *Theileria parva* genome refines 53% of the proteome and uncovers essential components of N-glycosylation, a conserved pathway in many organisms. *BMC Genomics*. 2020 Apr 3;21(1):279. doi: 10.1186/s12864-020-6683-0. PubMed PMID: 32245418; PubMed Central PMCID: PMC7126163.
11. **Tretina K**, Haidar M, Madsen-Bouterse SA, Sakura T, Mfarrej S, Fry L, Chaussepied M, Pain A, Knowles DP, Nene VM, Ginsberg D, Daubenberger CA, Bishop RP, Langsley G, Silva JC. *Theileria* parasites subvert E2F signaling to stimulate leukocyte proliferation. *Sci Rep*. 2020 Mar 4;10(1):3982. doi: 10.1038/s41598-020-60939-x. PubMed PMID: 32132598; PubMed Central PMCID: PMC7055300.
12. Palmateer NC, **Tretina K**, Orvis J, Ifeonu OO, Crabtree J, Drabek E, Pelle R, Awino E, Gotia HT, Munro JB, Tallon L, Morrison WI, Daubenberger CA, Nene V, Knowles DP, Bishop RP, Silva JC. Capture-based enrichment of *Theileria parva* DNA enables full genome assembly of the first buffalo-derived strain and reveals exceptional intra-specific genetic diversity. *PLoS Negl Trop Dis*. 2020 Oct;14(10):e0008781. doi: 10.1371/journal.pntd.0008781. eCollection 2020 Oct. PubMed PMID: 33119590.

Submitted or In-Revision Peer-reviewed journal articles

1. Park E, Kim BK, Kumar P, **Tretina K**, Maminska A, Philbrick W, Flavell RA, MacMicking JD "A sequential GBP hierarchy directs the non-canonical inflammasome response". Submitted to *Science*.

Non-peer reviewed journal articles

1. **Tretina K**, and Fecenko-Tacka K. "Interleukin-10 Enhances Epstein-Barr Virus Transformation in Human Lymphocytes." *Cell Collections*, 2007: 16-18.

Book Chapters

1. Harb OS, Boehme U, Crouch K, Ifeonu OO, Roos DS, Silva JC, Silva-Franco F, Svärd S, **Tretina K**, and Weedall G, "Protozoan Parasite Genomics" (book) Springer-Verlag Wein 2016, J. Walochnik, M. Duchêne (eds.), Molecular Parasitology, DOI 10.1007/978-3-7091-1416-2_1

Abstracts and/or Proceedings

Local

1. **Tretina K**, Gotia HT, Orvis J, Abolude OO, Kumari P, Nene VM, Bishop R, Daubenberger C, Silva JC. "Identification of transcriptional *cis*-regulatory motifs in *Theileria parva*, an intracellular apicomplexan parasite of cattle in sub-Saharan Africa." Annual University of Maryland Graduate Student Conference, University of Maryland, Baltimore MD, June 2013
2. **Tretina K**, Gotia HT, Orvis J, Abolude OO, Kumari P, Nene VM, Bishop R, Daubenberger C, Silva JC. "*Theileria* parasites subvert Retinoblastoma-1/E2F signaling to stimulate host cell proliferation" American Society of Microbiology Maryland Chapter Annual Meeting, Baltimore, MD, June 2016
3. **Tretina K**, Gaudet, RG, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Yale University Systems Biology Retreat, New Haven, CT, December 2016.
4. **Tretina K**, Maminska A, Gaudet, RG, Kim B, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Human Translational Immunology Retreat, New Haven, CT, December 2016.
5. **Tretina K**, Maminska A, Gaudet, RG, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Yale University Systems Biology Retreat, New Haven, CT, December 2017.
6. **Tretina K**, Maminska A, Gaudet, RG, Kim B, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Human Translational Immunology Retreat, New Haven, CT, December 2017.
7. **Tretina K**, Maminska A, Gaudet, RG, Kim B, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Yale University Systems Biology Retreat, New Haven, CT, December 2018.

8. **Tretina K**, Maminska A, Gaudet, RG, Kim B, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Human Translational Immunology Retreat, New Haven, CT, December 2018.
9. **Tretina K**, Maminska A, Gaudet, RG, Kim B, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Microbiology Research In Progress talk, New Haven, CT, November 2018.
10. **Tretina K**, Maminska A, Gaudet, RG, Kim B, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Yale University Systems Biology Retreat, New Haven, CT, December 2019.
11. **Tretina K**, Maminska A, Gaudet, RG, Kim B, MacMicking JD. "Intracellular Immunity to Major Human Parasites High-content pipeline to discover new defense networks." Human Translational Immunology Retreat, New Haven, CT, December 2019.

National

1. **Tretina K**, Moser K, Ifeonu OO, Bensch S, Munro JB, Silva JC. "Turning back the clock: a history of apicomplexan species divergence." American Society of Tropical Medicine and Hygiene Annual Conference, Atlanta, GA, November 2016.
2. **Tretina K**, Badoui J, Palmateer N, Bishop R, Silva JC. "Long-read PCR sequencing reveals Theileria parasite species and antigen diversity." American Society of Tropical Medicine and Hygiene Annual Conference, Baltimore, MD; Poster Presentation, November 2017.
3. **Tretina K**. "A machine learning approach to NTD genomics research." American Society of Tropical Medicine and Hygiene Annual Conference, Virtual; Oral Presentation, November 2020.
4. **Tretina K**. "A machine learning approach to NTD genomics research." German Conference on Bioinformatics (GCB), Virtual; Oral Presentation, December 2020.

Proffered Communications

Local

1. **Tretina K.** “Drugs against apicomplexan parasites of cows in Africa.” Baltimore City Community College Science Symposium, Baltimore, MD, July 2015.
2. **Tretina K.** “Intracellular Immunity to Major Human Parasites: a high-content pipeline to discover new defense networks.” Yale Systems Biology Retreat, New Haven, CT, November 2017.
3. **Tretina K.** “The evolution of the novel coronavirus”. Yale Systems Biology Institute, New Haven, February 2020.
4. **Tretina K.** “Cell-autonomous immunity to apicomplexan parasites of humans”. University of Maryland, Baltimore, Molecular Microbiology and Immunology Department Seminar. May 2020.

National

1. Horch M, Sahli N, Zale E, **Tretina K**, Nguyen VH. “Selected Commensals Mediate GvHD Via MyD88-Dependent Signalling in Non-Hematopoietic Cells.” 54th ASH Annual Meeting and Exposition, Atlanta, GA; Poster with Oral Presentation, December 2012
2. **Tretina K**, Gotia HT, Orvis J, Abolude OO, Kumari P, Nene VM, Bishop R, Daubenberger C, Silva JC. “Identification of transcriptional *cis*-regulatory motifs in *Theileria parva*, an intracellular apicomplexan parasite of cattle in sub-Saharan Africa”. American Society of Tropical Medicine and Hygiene Annual Conference, Marriott Wardman Park, Washington, D.C.; Oral Presentation, November 2013
3. **Tretina K**, Pelle R, Orvis J, Gotia HT, Ifeonu OO, Kumari P, Iqbal SBA, Nene VM, Daubenberger C, Bishop RP, Silva JC. “New insights into *Theileria parva* host-pathogen interactions”. American Society of Tropical Medicine and Hygiene Annual Conference, New Orleans, LA; Oral Presentation, November 2014
4. **Tretina K**, Haidar M, Pelle R, Orvis J, Gotia HT, Ifeonu OO, Chaussepied M, Kumari P, Iqbal SBA, Fry L, Knowles DP, Nene VM, Ginsberg D, Daubenberger C, Bishop RP, Langsley G, Silva JC. “Identification of parasite-induced host cell transformation factors based on the re-annotation of the *Theileria parva* genome

and on comparative genomics.” American Society of Tropical Medicine and Hygiene Annual Conference, Philadelphia, PA; Oral Presentation, October 2015

5. **Tretina K.** “Identification of parasite-induced host cell transformation factors based on the re-annotation of the *Theileria parva* genome and on comparative genomics.” Infection and (Presymptomatic) Transmission of SARS-CoV-2, Virtual; Oral Presentation, September 2020

International

1. **Tretina K,** Pelle R, Orvis J, Gotia HT, Ifeonu OO, Kumari P, Iqbal SBA, Nene VM, Daubenberger C, Bishop RP, Silva JC. “RNAseq-based Re-annotation of the *Theileria parva* Genome Informs the Prediction of Parasite Genes Involved in Host Cell Transformation.” Apicowplexa, Edinburgh, Scotland; Poster with Oral Presentation, June 2015
2. **Tretina K,** Haidar M, Pelle R, Orvis J, Gotia HT, Ifeonu OO, Chaussepied M, Kumari P, Iqbal SBA, Fry L, Knowles DP, Nene VM, Ginsberg D, Daubenberger C, Bishop RP, Langsley G, Silva JC. “A *Theileria parva* protein with an LXCXE motif can induce bovine host cell proliferation and binds host DNA signaling adaptor protein STING.” EMBO Symposium Innate Immunity in Host-pathogen Interactions, Heidelberg, Germany; Poster with Oral Presentation, June 2016