

DANIELLE M. TUFTS, Ph.D.

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Infectious Diseases and Microbiology Department in the Graduate School of Public Health
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EDUCATION

Assistant Professor	Infectious Diseases and Microbiology Department in the Graduate School of Public Health, University of Pittsburgh, Present
Associate Research Scientist	Ecology, Evolution, and Environmental Biology with Maria Diuk-Wasser Columbia University, 2020
Postdoctoral Researcher	Ecology, Evolution, and Environmental Biology with Maria Diuk-Wasser Columbia University, 2015-2020
Postdoctoral Researcher	Harold W. Manter Laboratory of Parasitology with Scott L. Gardner University of Nebraska-Lincoln, 2014-2015
Ph.D.	Biological Sciences (emphasis in Integrative Evolutionary Biology), University of Nebraska-Lincoln, 2013 Dissertation: <i>The Roles of Phenotypic Plasticity and Genotypic Specialization in High Altitude Adaptation</i>
M.S.	Biology, University of Texas, Tyler, 2008 Thesis: <i>Identification of Colony Phenotype and Potential Biological Control Methods of Solenopsis invicta Buren (Hymenoptera: Formicidae) using Molecular Techniques</i>
B.S.	Wildlife, Fish, and Conservation Biology (Minor in Animal Genetics), University of California, Davis, 2005
A.A.	Liberal Arts, College of the Sequoias, 2001

RESEARCH INTERESTS

Vector-Borne and Infectious Diseases; Host-Pathogen Interactions; Disease Ecology; Microbiology; Evolution and Ecology; Wildlife Genetics; Parasitology; Conservation Genetics; Population Genetics

RESEARCH EXPERIENCE

Postdoctoral Researcher, Columbia University, 2015 – 2020

- Supervisor: Dr. Maria Diuk-Wasser
- Genotypic variation and specialization of *Borrelia burgdorferi* diversity in nature, host tropism (collaboration with Dr. Yi-Pin Lin at the Wadsworth Center NYS Department of Health and Dr. Sergios-Orestis Kolokotronis at SUNY downstate)
- Bloodmeal analysis of questing nymphs using transposable elements for different host species (collaboration with Dr. Sam Telford III and Dr. Heidi Goethert at Tufts University)
- Laboratory and field studies on pathogen transmission pathways (i.e. vertical transmission)
- Field and molecular assessment of the newly invasive *Haemaphysalis longicornis* (Asian longhorned ticks)

- Tick host preference on various mammals (*Odocoileus virginianus*, *Procyon lotor*, *Didelphis virginiana*, *Sylvilagus floridanus*, *Mephitis mephitis*, *Marmota monax*, and *Sciurus carolinensis*), tick behavioral studies, and domestic animal assessment with veterinary hospitals and shelters on Staten Island, NY
- Screening of pathogens from host-derived *H. longicornis* ticks using the “tick chip” a nanoscale PCR testing platform for detection of 26 tick-borne diseases (collaboration with Dr. Laura Goodman at Cornell University)
- Metagenomics analysis to detect bacterial and viral infections in *H. longicornis* (collaboration with Dr. Rafal Tokarz and Dr. Ian Lipkin at Columbia University)
- Immunological assessment of vertically transmitted *Babesia microti* infection in offspring (collaboration with Dr. Choukri Mamoun at Yale University)
 - Immunofluorescence Assay (IFA), western blot, gram-positive anaerobic cocci (GPAC)
- Infected lab *Peromyscus* with *Borrelia* and *Babesia* to determine gene expression, transcriptomics, and microbiome (collaboration with Dr. Alan Barbour at UC Irvine)
- Perform qPCR on field collected samples to determine infection status with *Borrelia burgdorferi*, *B. miyamotoi*, *Babesia microti*, Powassan virus, hantavirus, and other zoonotic pathogens
- Performed a Markov State Model to investigate the associations between *Borrelia* and *Babesia* coinfection and transmission in *Peromyscus leucopus* mice using multiyear data
- Categorize the endoparasitic communities in small mammal populations in New England
- Investigate how multiple infections (ecto- and endo-parasites) affects host health and fitness
- Investigate co-infections of parasites (ecto and endo) and which combinations are more prevalent and how this affects various host’s fitness using necropsy and fecal material
- Conducted an overwintering tick survivorship and host finding success study using field derived data
- Assist with laboratory coinfection mouse models and immunological assays
- Analyze ticks, blood, and tissues collected from Florida panthers (*Puma concolor*) to determine *Borrelia* and *Babesia* infection prevalence (collaboration with Dr. Durland Fish at Yale University)
- Train field research teams in proper collection of samples and handling of wild animals including *Peromyscus leucopus*, *Microtus pennsylvanicus*, *Tamias striatus*, *Blarina brevicauda*, *Sorex* sp., *Microtus pinetorum*, *Didelphis marsupialis*, *Sciurus carolinensis*, *Tamiasciurus hudsonicus*, *Glaucomys sabrinus*, *Procyon lotor*, *Mephitis mephitis*
- Established the molecular lab, purchased and organized all equipment for research
- Mentor and train field technicians, undergraduates, and graduate students
- Grant and manuscript writing

Postdoctoral Researcher, HW Manter Lab of Parasitology, University of Nebraska, 2014 – 2015

- Supervisor: Dr. Scott L. Gardner
- Established and managed a molecular genetics parasitology lab for identification of parasites and pathogens using molecular and morphological techniques
- Described a new species of *Taenia* tapeworm from a vole (*Alticola* sp.) from Mongolia
- Helped describe two new species of *Catenotaenia* using molecular identification and phylogenetics
- Conducted phylogenetic studies comparing host-parasite interactions from Mongolia and Bolivia using *Taenia* spp. and *Paraspidodera* spp., respectively
 - Software includes: DnaSP, Mesquite, TNT, MEGA, Network, TreeFinder
- Lead field research team to collect small rodents and investigate the range expansion, gene flow, and spatial distribution of *Echinococcus* spp. tapeworms in North America, an emerging disease and major human pathogen in various countries
- Mentored undergraduate and graduate students on proper laboratory techniques
 - Pipetting techniques, PCR, gel electrophoresis, sequencing, DNA extractions using kits and phenol chloroform, primer design, etc.
- Assisted in grant and manuscript writing

Doctoral Student, University of Nebraska, 2009-2013

- Advisor: Dr. Jay F. Storz
- Completed a study on phenotypic plasticity of various hematological parameters in *Peromyscus maniculatus* from high and low altitude subjecting individuals to both hypoxia and normoxia
 - Trapped and bled mice from Colorado and Nebraska, acclimated mice to low/high altitude using hypobaric chambers in a common garden environment
 - Measured hemoglobin (Hb) concentration, hematocrit, RBC size, MCHC, RBC count, DPG concentrations, MCV, MCH, Lactate and Glucose levels in mice
 - Statistical analyses included: Repeated Measures Two-way ANOVA, ANCOVA, and Kolmogorov-Smirnov test, using SAS and R programs
- Investigated genetic and functional variation of Hb genes in two mammals
 - Captured high and low altitude pika (*O. princeps* and *O. collaris*) and marmot (*M. flaviventris* and *M. caligata*) species from Colorado and Alaska
- Extracted DNA from pika liver tissue for sequencing of α and β Hb genes
- Extracted RNA from marmot bone marrow for Rapid Amplification of cDNA ends (RACE) sequencing of α and β Hb genes
- Characterized Hb isoforms using an isoelectric focusing gel (IEF) technique
- Performed High Performance Liquid Chromatography (HPLC) to obtain purified Hb for functional analysis
- Constructed recombinant Hb mutants (via site-directed mutagenesis) to determine amino acid substitutions responsible for variation in Hb-O₂ affinity
 - Bioinformatic software and molecular evolutionary tools utilized: PyMOL, Geneious, DnaSP, SigmaPlot
- Screened *P. maniculatus* from Colorado for linkage disequilibrium in the α -globin gene
 - Touchdown PCR techniques

Side project in the Harold W. Manter Parasitology Lab, University of Nebraska, 2010-2013

- Supervisor: Dr. Scott L. Gardner
- Necropsied *Ochotona* and *Marmota* individuals collected from main PhD project
- Developed techniques for removing and preserving various types of parasites
- Perfected parasite identification skills

Internship, Conservation Genetics Lab at the Henry Doorly Zoo, Omaha NE, 2010-2012

- Supervisors: Dr. Edward E. Louis and Shannon Enberg
- Conducted various research on the Madagascar Biodiversity and Biogeography Project
- Constructed microsatellite nuclear DNA markers
- Extracted DNA from fecal samples of the critically endangered Greater Bamboo Lemur (*Prolemur simus*) from different populations as a non-invasive method of determining new individuals, gene flow, and establish differences among northern and southern populations

Research Associate/Laboratory Technician, University of Texas, 2008-2009

- Supervisor: Dr. Blake Bextine
- Assessed the virulence and resistance of hosts infected with the *Solenopsis invicta* virus (SINV) to different commercially available and commonly used pesticides
 - Determined that SINV provides a protective advantage and decreased mortality
- Gained expertise and trained students in virus detection, characterization, and integration
 - Examined four insect taxa: Fire Ant- *Solenopsis invicta*; Leafhopper- *Homalodisca vitripennis*; Psyllid- *Bactericera cockerelli*, and Honey bee- *Apis mellifera*
- Developed bacterial cell cultures from *S. invicta* and *B. cockerelli*
- Supervised students, managed the lab, trained graduate and undergraduate students on proper lab techniques, ordered supplies, monitored safety, and disposed of chemicals
- Maintained insect cultures and plant production in the greenhouse

- Reviewed manuscripts, composed manuscripts, and contributed to grant writing

Side project in a Conservation Genetics Lab, University of Texas, 2008-2009

- Supervisor: Dr. John Playck
- Conducted population genetics study of Southern Flying Squirrels (*Glaucomys volans*) in Texas
- Performed DNA extractions from Texas Horned Lizard (*Phrynosoma cornutum*) tissue, Box turtle (*Terrapene* spp.) tail and nail clips, and Garter snake (*Thamnophis* spp.) tissue
- Extracted DNA from feather clips and performed PCR for Chipping Sparrow (*Spizella passerine*) sex identification

Masters Graduate Student, University of Texas, 2006-2008

- Advisor: Dr. Blake Bextine
- Conducted original research on viruses in Red Imported Fire Ants (*Solenopsis invicta* Buren) from east Texas populations
 - Molecular techniques include: DNA extractions using Qiagen DNeasy Tissue kit, RNA extractions using TRIzol reagent, Reverse Transcriptase Polymerase Chain Reaction (RT-PCR), real-time PCR, in house sequencing using a Beckman Coulter CEQ8000
 - Statistical analysis include: Generalized Linear Mixed Model using SAS
- Developed a protocol for whole virus extraction from *S. invicta* for microencapsulation of virus
- Tested effectiveness of virus mortality on lab and field *S. invicta* colonies
- Discovered a genetically different *Solenopsis invicta* virus (SINV) in Texas *S. invicta* colonies, named this virus SINV-1(TX5)
- Devised a method for extracting hemolymph and ovaries from *S. invicta* queens
- Isolated and analyzed hemolymph for bacteria fauna using the 16S rRNA
 - Identified bacterium, conducted sequence analyses, and submitted sequences to GenBank
- Gained experience in growing *Bacillus* spp. bacteria on TSA plates
- Developed a method for detecting monogyne/polygyne colonies using SYBR[®] Green quantitative real-time PCR (QRT-PCR) and the Glycoprotein IX (*Gp-9*) gene
- Designed primers and aided others in the use of Primer3 and Netprimer Launch
- Mentored undergraduates in various lab techniques and software
 - BioEdit Sequence Alignment Editor, ClustalW, Microsoft Word and Excel

Field Research Assistant, Yosemite National Park, Ca, Summer 2006

- Supervisor: Katryna Fler
- Conducted research on vector borne diseases in rodents
 - Trapped *Peromyscus*, *Tamiasciurus*, and *Sciurus* spp. using Sherman and Tomahawk Live traps
- Collected ectoparasites from captured animals, administered ear tags, and recorded measurements

Laboratory Assistant II/Laboratory Technician, University of California, Davis, 2003-2006

- Supervisors: Drs. Sergey Nuzhdin and Anne Ginessel
- Performed PCR analyses using different enzymes, multiplex PCRs, microsatellite markers, SNP analysis, troubleshooting, gel electrophoresis, spectrophotometry
- Ordered reagents and supplies, disposed of hazardous waste and toxic chemicals
- Performed DNA/RNA extractions from *Drosophila* using phenol-chloroform and purification using a Qiagen Clean-up Kit
- Conducted cRNA synthesis from *Drosophila* embryos using TRIzol reagent, labeled and fragmented cRNA for analyses using Affymetrix Genechips
- Completed hybridization experiments using radioactively labeled probes (³³P) and genotyping experiments using specific ligation
- Designed oligos using Primer 3, Netprimer Launch, DNA sequencer, and Oligo Calculator
 - Software: Microsoft Word, Excel, STRand, perform multiple alignments using BioEdit
- Mentored others in data collection and documentation of various experiments

Internship, Wildlife Veterinary Genetics Lab, University of California, Davis, 2004-2005

- Supervisors: Josh Hull and Dr. Holly Ernest
- Developed microsatellite markers for a population genetics study on Swainson's Hawks (*Buteo swainsoni*) and other raptor species (*Buteo* spp.)
- Performed PCR testing cross species multiplex reactions
- Assisted in making collection kits for wildlife biologists in the field
- Conducted DNA extractions from various mammalian tissue and avian blood samples

Sacramento Zoo Keeper-Aide, Sacramento Zoo, 2003-2005

- Assisted in daily animal care and maintenance, prepared animal diets, and created enrichment puzzles for the animals
- Assisted with cleaning and disinfecting cages, grottos, and work areas
- Learned about captive animal husbandry and behaviors

Summer Abroad Study Program, University of Cape Town, Edeni Private Game Reserve, South Africa, 2004

- Assisted KERI research group with assessment of an African Wild Dog
- Measured paw size and length, total body length and teeth size, administered antibiotics and vitamins by subcutaneous injection, and collected an ear clipping for genetic research

Veterinary Internship, Small Animal Surgery Division in UC Davis veterinary Hospital, 2003

- Observed numerous surgeries, retrieved surgical instruments and supplies
- Assisted in cleaning, disinfected surgical instruments, and prepared sterilized rooms for surgeries

AWARDS and HONORS

Certificate of Recognition for "Outstanding contribution in insect pathology-virus", SXSI, Chair Dr. W. Hunter, USDA, ARS, 2010

Best overall poster at the Science, Technology, Engineering and Mathematics (STEM) meeting at the University of Texas, Tyler, 2008

Student and Young Professional Award, Entomological Society of America Governing Board, 2008

Certificate for Completion of training in virus purification and propagation in insects. Lead Researcher Dr. W. Hunter, USDA, ARS, 2008

Second place for the oral presentation competition at the Southwestern Branch meeting of the Entomological Society of America in Fort Worth, Texas, 2008

First place for the poster competition at the Southwestern Branch meeting of the Entomological Society of America in Corpus Christi, Texas, 2007

MEMBERSHIPS/UNIVERSITY SERVICES

American Society of Mammalogists member, 2009-Present

The Entomological Society of America (ESA) member, 2006-2009, Present

Sigma Xi member, 2010-Present

Columbia University Postdoc Society, Advocacy Committee, 2017-2020

Women in Science at Columbia Postdoctoral Liaison, 2016-2020

The New York Academy of Science, 2016-2020

Columbia University Postdoc Society, Research and Professional Development Committee, 2016-2017

The Southwestern Association of Parasitologists member, 2011-2014

The Wildlife Society member, 2012-2014

The Society for Integrative and Comparative Biology member, 2011-2013

The Society for the Study of Evolution member, 2011-2013

University of Nebraska Biology Graduate Student Association member, 2008-2013

University of Nebraska Biology Graduate Student Association Secretary, 2010-2011
Departmental Graduate Student Committee Chair, University of Texas, 2008

GRANTS/FELLOWSHIPS (Total = \$813,540)

\$800,000 *Tradeoffs between Specialist and Generalist Strategies for Host Immune Evasion in a Vector-Borne Bacterium*. National Science Foundation Grant Co-investigator, 2018.
\$50 American Society of Microbiology Travel Award, 2017.
\$600 American Society of Mammalogists Young Professional Travel Grant, 2016.
\$750 University of Nebraska-Lincoln Postdoctoral Travel Grant, 2015.
\$1,300 Graduate Assistance in Areas of National Need (GAANN) Fellowship, 2013.
\$350 University of Nebraska-Lincoln Special Funds Travel Fellowship, 2013.
\$300 American Society of Mammalogists Travel Grant, 2013.
\$2,000 University of Nebraska-Lincoln Special Funds Grant, 2012.
\$1,500 American Society of Mammalogists Grants-In-Aid of Research, 2012.
\$1,000 University of Nebraska-Lincoln Milton E. Mohr Fellowship, 2012.
\$600 University of Nebraska-Lincoln Special Funds Travel Fellowship, 2012.
\$250 Annual Basolo Travel Fellowship, 2012.
\$1,470 American Society of Mammalogists Grants-In-Aid of Research, 2011.
\$1,000 University of Nebraska-Lincoln Special Funds Grant, 2011.
\$500 Warren F. and Edith R. Day Student Aid Fellowship, 2011.
\$400 University of Nebraska-Lincoln Special Funds Travel Fellowship, 2011.
\$1,470 University of Nebraska-Lincoln Special Funds Grant, 2010.

OUTREACH

Group leader for Girl's Science Day at Columbia University, 2015-2019
Poster judge at the annual Scientista Symposium, 2017-2018
Reviewer and judge of student presentations at the American Society of Mammalogists meeting 2016
Reviewer for the UNL Undergraduate Creative Activities and Research (UCARE) Grant, 2015
Judge at the Zoetis-Lincoln Public Schools-Novarits Science Fair, 2015
Activity leader for Eight Legged Encounters at Morrill Hall Natural History Museum, 2014
Judge at Hill Elementary School Science Fair, 2014-2013
Activity leader for Sunday with a Scientist at Morrill Hall Natural History Museum, 2013
Booth designer and leader at Earth Day Insect and Bird Education Booth at Camp Tyler, 2008

In the press

Lyme disease and parthenogenetic ticks. Invited guest speaker on MonsterTalk audio podcast (August 2019) (www.monstertalk.org).
Why Are Ticks So Hard to Kill? Video interview with Business Insider (September 2019) (<https://www.youtube.com/watch?v=5bEimiIZ9dA>).

PUBLICATIONS (*denotes co-first authorships)

Tufts DM, Adams B, Diuk-Wasser MA. Coinfection dynamics of *Peromyscus leucopus* populations infected with *Borrelia burgdorferi* and *Babesia microti* in New England. (In prep).
Tufts DM, Gardner SL. Phylogenetic analysis of *Taenia* spp. tapeworms from Mongolia using mitochondrial genes. (In prep).

- Diaz AR, Neira M, Stewart-Ibarra A, Jeremiah KJ, Rosbinson J, Luca L, Minalla J, **Tufts DM**. The post-outbreak Zika virus detection in *Aedes aegypti* populations in Bahia, Ecuador: a further look into Zika strains across Latin America. (MS student paper in prep).
- Kahn BCM, Drew JA, Humphries A, Palmer MI, **Tufts DM**. Variation in metal content, body condition, and a metallothionein gene in Eastern oysters (*Crassostrea virginica*). (In Review).
- Plimpton L, Henger C, Munshi-South J, **Tufts DM**, Kross S, Diuk-Wasser M. What the cat dragged in: Variations in diet composition among free-ranging cats residing in urban colonies and implications for management. (In Review).
- Tufts DM**, McClure M, Diuk-Wasser, MA. *Ixodes scapularis* (Acari: Ixodidae) nymphal survival and host-finding success in the Eastern United States. (In Review).
- Tufts DM**, Diuk-Wasser MA. Vertical transmission: An important vector-independent transmission pathway of *Babesia microti* in the natural reservoir host *Peromyscus leucopus*. (In Press).
- Tufts DM**, Goodman LB, Benedict MC, Davis, AD, VanAcker, MC, Diuk-Wasser MA. Association of the invasive *Haemaphysalis longicornis* tick with vertebrate hosts, other native tick vectors, and tick-borne pathogens in New York City. International Journal of Parasitology (In Press).
- Tufts DM**, Tokarz R, Sameroff S, Lipkin WI, Diuk-Wasser MA. (2020). A metagenomic examination of the pathobiome of the invasive tick species, *Haemaphysalis longicornis*, collected from a New York City borough, USA. Tick and Tick-Borne Diseases 11(6): 101516.
- Milovic A, Bassam K, Shao H, Chatzistamou I, **Tufts DM**, Diuk-Wasser MA, Barbour AG. (2020). Lactobacilli and other gastrointestinal microbiota of *Peromyscus leucopus*, reservoir host for agents of Lyme disease and other zoonoses in North America. PLoS One 15(8): e0231801.
- Egizi A, et al. **Tufts DM** (21st author alphabetically arranged) (2020). First glimpse into the origin and epidemiological spread of the Asian longhorned tick, *Haemaphysalis longicornis*, in the United States. Zoonoses and Public Health 67: 637-650. doi: 10.1111/zph.12743.
- Ronai IJ*, **Tufts DM***, Diuk-Wasser MA. (2020). Aversion of the invasive Asian longhorned tick to the white-footed mouse, the dominant reservoir of tick-borne pathogens in the USA. Medical and Veterinary Entomology, 34: 369-373.
- Frye AM, **Tufts DM**, Ram S, Diuk-Wasser MA, Blom A, Lin YP. (2020). A soft tick *Ornithodoros moubata* salivary protein OmCI is a potent inhibitor to prevent avian complement activation. Tick and Tick-Borne Diseases 11(2): 101354.
- Tufts DM**, Hart TM, Chen G, Kolokotronis SO, Diuk-Wasser MA, Lin YP. (2019). Outer surface protein polymorphisms linked to host-spirochete association in Lyme borreliosis. Molecular Microbiology 111(4): 868-882.
- Tufts DM**, VanAcker M, Fernandez MP, DeNicola A, Egizi, A, Diuk-Wasser MA. (2019). Distribution, host-seeking phenology, and host and habitat associations of *Haemaphysalis longicornis* ticks, Staten Island, New York, USA. Emerging Infectious Diseases 25(4): 792-796.
- Huang C*, Kay SC*, Davis S, **Tufts DM**, Gaffett K, Tefft B, Diuk-Wasser MA. (2019). High burdens of *Ixodes scapularis* larval ticks on white-tailed deer may limit Lyme disease risk in a low biodiversity setting. Ticks and Tick-borne Diseases 10: 258-268.
- Tufts DM**, Diuk-Wasser MA. (2018). Transplacental transmission of tick-borne *Babesia microti* in its natural host *Peromyscus leucopus*. Parasites and Vectors 11: 286.
- Tokarz R, Sameroff S, Tagliaferro T, Jain K, Williams SH, Cucura DM, Rochlin I, Monzon J, Carpi G, **Tufts DM**, Diuk-Wasser M, Brinkerhoff J, Lipkin WI. (2018). Identification of novel viruses in *Amblyomma americanum*, *Dermacentor variabilis*, and *Ixodes scapularis* ticks. mSphere American Society for Microbiology 3:e00614-17.
- Rynkiewicz E*, Brown J*, **Tufts DM**, Huang C, Bent SJ, Fish D, Diuk-Wasser MA. (2017). Closely related *Borrelia burgdorferi* sensu stricto strains exhibit similar fitness in single mouse infections and asymmetric competition in multiple infections. Parasites and Vectors 10: 64.
- Dursahinhan AT, Nyamsuren B, **Tufts DM**, Gardner SL. (2017). A New Species of *Catenotaenia* (Cestoda: Catenotaeniidae) from *Pygeretmus pumilio* Kerr, 1792 from the Gobi of Mongolia. Comparative Parasitology 84(2): 124-134.

- Tufts DM**, Batsaikhan N, Pitner M, Racz GR, Dursahinhan AT, Gardner SL. (2016). Identification of *Taenia* metacestodes from Mongolian mammals using multivariate morphometrics of the rostellar hooks. *Exploration into the Biological Resources of Mongolia (Erforschung biologischer Ressourcen der Mongolei)* 13: 361-375.
- States SL, Huang CI, Davis S, **Tufts DM**, Diuk-Wasser MA. (2016). Co-feeding transmission facilitates multiple strain coexistence in *Borrelia burgdorferi*, the Lyme disease agent. *Epidemics* 19: 33-42.
- Tufts DM**, Natarajan C, Revsbech I, Projecto-Garcia J, Hoffmann FG, Weber RE, Fago A, Moriyama H, Storz JF. (2014). Epistasis constrains mutational pathways of hemoglobin adaptation in high-altitude pikas. *Molecular Biology and Evolution* 32(2): 287-298.
- Tufts DM**, Hunter WB, Bextine B. (2014). *Solenopsis invicta* virus (SINV-1) infection and insecticide interactions in the red imported fire ant (Hymenoptera: Formicidae). *Florida Entomologist* 97(3): 1251-1254.
- Revsbech IG*, **Tufts DM***, Projecto-Garcia J, Moriyama H, Weber RE, Storz JF, Fago A. (2013). Haemoglobin function and allosteric regulation in semi-fossorial rodents (Family Sciuridae) with different altitudinal ranges. *Journal of Experimental Biology* 216:4264-4271. **Awarded JEB's Outstanding paper of 2013**
- Tufts DM**, Revsbech IG, Cheviron ZA, Weber RE, Fago A, Storz JF. (2013). Phenotypic plasticity in blood-oxygen transport in highland and lowland deer mice. *Journal of Experimental Biology* 216: 1167-1173.
- Nickol DR, **Tufts DM**. (2013). Single-dose Metronidazole clears *Opalina* spp. from juvenile *Bufo woodhousii*. *Journal of Parasitology* 99(3): 573-575.
- Tufts DM**, Spencer KR, Hunter WB, Bextine B. (2011). Delivery system using sodium alginate virus loaded pellets to Red Imported Fire Ants (*Solenopsis invicta*, Hymenoptera: Formicidae). *Florida Entomologist* 94(2): 237-241.
- Tufts DM**, Hunter WB, Bextine B. (2010). Discovery and effects of the *Solenopsis invicta* virus (SINV-1 (TX5)) on Red Imported Fire Ant populations. *Journal of Invertebrate Pathology* 104: 180-185.
- Tufts DM**, Bextine B. (2009). Identification of bacterial species in the hemolymph of queen *Solenopsis invicta* (Hymenoptera: Formicidae). *Environmental Entomology* 38(5): 1360-1364.
- Gunawan S, **Tufts DM**, Bextine B. (2008). Molecular identification of hemolymph-associated symbiotic bacteria in Red Imported Fire Ant larvae. *Current Microbiology* 57(6): 575-579.
- Nuzhdin SV, **Tufts DM**, Hahn MW. (2008). Abundant genetic variation in transcript level during early *Drosophila* development. *Evolution and Development* 10(6): 683-689.
- Graze RM, Barmina O, **Tufts D**, Naderi E, Harmon KL, Persianinova M, Nuzhdin SV (2007). New candidate genes for sex-comb divergence between *Drosophila mauritiana* and *Drosophila simulans*. *Genetics* 176: 2561-2576.
- Hull JM, **Tufts D**, Topinka JR, May B, Ernest HB (2007). Development of 19 microsatellite loci for Swainson's hawks (*Buteo swainsoni*) and other buteos. *Molecular Ecology Notes* 7, 346-349.

Book Chapter Reviews

- Introductory Ecology*. K Fox, Oxford University Press. (Reviewed 2/2016).
- Ecology: A Unified Approach*. H Stevens, Oxford University Press. (Reviewed 5/2015).
- Evolution* 2nd Edition. C Bergstrom and LA Dugatkin, WW Norton & Company. (Reviewed 7/2015).
- Ecology: Evolution, Application, Integration*. DT Krohne, Oxford University Press. (Reviewed 10/2015).

Reviewer for Scientific Journals

Tick and Tick-Borne Diseases, Parasitology Research, *European Journal of Protistology*, *International Journal of Parasitology*, *Integrative Zoology*, NSF proposal review, *Journal of Medical Entomology*, *Molecular Ecology*, *Invertebrate Zoology*, *Molecular Biology and Evolution*, *Epidemiology and Infection*, *Journal of Experimental Biology*, *Journal of Invertebrate Pathology*

PRESENTATIONS

- Tufts DM**, Dupuis AP, Marcinkiewicz A, Stout J, Kramer LD, Combs M, Diuk-Wasser MA, Lin YP. (2020). Host specialization may influence *Borrelia burgdorferi* strain persistence transmitted by *Ixodes scapularis* ticks. Ecological Society of America annual meeting (poster).
- Combs M, Adams B, **Tufts DM**, Kolokotronis S, Diuk-Wasser M. (2020). Host specificity and frequency dependent selection as drivers of strain diversity for the pathogenic microbe, *Borrelia burgdorferi*. Ecological Society of America annual meeting (oral presentation).
- Tufts DM**. (2020). Association of Asian longhorned ticks with mesomammals on Staten Island, NYC. Annual meeting of the Northeast Regional Center for Excellence in Vector-Borne Disease (oral presentation).
- Hart, TM, **Tufts DM**, Dupuis AP, Blom AM, Starkey S, Ram S, et al. (2020). A Lyme disease bacterial protein CspA determines host competency through the convergent evolution of complement evasion in tick blood meal. International Complement workshop (oral presentation).
- Ronai I, **Tufts DM**, Diuk-Wasser MA. (2019). Aversion of the invasive Asian longhorned tick to the white-footed mouse (the dominant reservoir of tick-borne pathogens in the USA). Entomological Society of America annual meeting (poster).
- Tufts DM**. (2019). The ecology of *Haemaphysalis longicornis* emergence on Staten Island, New York, and its public health implications. North American Invasive Species Management Association - New York Invasive Species Research Institute (NAISMA-NYISRI) Joint Conference (oral presentation).
- Tufts DM**, McClure M, Olbrantz C, Diuk-Wasser MA. (2019). Disentangling the key components of tick-borne pathogen transmission: overwintering survival and host-finding success of *Ixodes scapularis* in Eastern United States. Ecology and Evolution of Infectious Diseases 17th annual meeting (poster).
- Kahn BCM, **Tufts DM**, Drew JA, Humphries A, Palmer M. (2019). Ecotoxicology, genetics, and adaptation: a holistic approach to assessing spatial variation in the Eastern oyster. Columbia University graduate student symposium (poster).
- Tufts DM**. (2019). Efficiency of *Babesia microti* vertical transmission in *Peromyscus leucopus* mouse pups and subsequent horizontal transmission to ticks. International Babesiosis Meeting II (oral presentation).
- Tufts DM**. (2019). The ecology of *Haemaphysalis longicornis* emergence on Staten Island, New York, and its public health implications. Tick Summit VIII, Center for Zoonotic and Vector borne Diseases at Maryland Department of Health (oral presentation).
- VanAcker MC, **Tufts DM**, Diuk-Wasser, M. (2019). Ixodid tick community, distribution, and vertebrate host association on Staten Island, NY. The Northeast Regional Center for Excellence in Vector-Borne Diseases 2nd Annual meeting (poster).
- Tufts DM** and Diuk-Wasser M. (2018). Vertical transmission: A non-vector mediated transmission pathway of *Babesia microti* in *Peromyscus leucopus* mice. 3rd Annual NYC Parasitology Meeting, Hunter College (poster).
- Hart T, **Tufts D**, Dupuis A, Nguyen NTT, Nowak N, Sprong H, et al. (2018). Convergent evolution of a Lyme disease borreliae surface protein drives vertebrate animal-specific pathogen transmission through host complement evasion. International conference on Lyme Borreliosis and other tick-borne diseases (poster).
- Tufts DM**. (2018). The ecological and genetic drivers of vector-borne disease emergence. University of Nebraska-Lincoln Manter Laboratory Seminar (*Invited seminar speaker*).
- McClure M, **Tufts DM**, Fernandez M, Tsao J, Hickling GJ, Diuk-Wasser, M. (2018). Modeling environmental drivers of host-seeking behaviors that affect blacklegged tick host-finding success. American Society of Tropical Medicine and Hygiene 67th Annual meeting (poster).
- Diuk-Wasser M, and **Tufts DM**. (2018). Ecological factors driving the emergence of babesiosis in the United States: The role of coinfection in natural hosts and alternative transmission pathways. American Society of Tropical Medicine and Hygiene 67th Annual meeting (oral presentation).

- Diuk-Wasser M, **Tufts DM**, Huang C, Kay S, Davis S. (2018). The dual role of white-tailed deer on Lyme disease risk in low biodiversity habitats. 15th International Conference on Lyme Borreliosis and other Tick-Borne Diseases meeting (*poster*).
- Tufts DM**, Bento AI, Diuk-Wasser M. (2018). Higher than expected prevalence of *Babesia microti* than *Borrelia burgdorferi* in mice and ticks: within-host facilitation or alternative transmission pathway? Ecology and Evolution of Infectious Diseases 16th annual meeting (*poster*).
- Tufts DM**. (2018) Understanding the ecological and genetic drivers of vector-borne diseases. Northern New Mexico College (*Invited seminar speaker*).
- Tufts DM**, Diuk-Wasser M. (2017). Vertical transmission of tick-borne *Babesia microti* in its natural host *Peromyscus leucopus*. 2nd Annual NYC Parasitology Meeting, American Museum of Natural History (*oral presentation*).
- Tufts DM**, Diuk-Wasser M. (2017). Tick-borne pathogen interactions in a natural reservoir host, *Peromyscus leucopus*. American Society for Microbiology, Spirochete Day-Research of Lyme disease causing bacteria and other spirochetes in New York State and Ontario, Canada (*Invited oral presentation*).
- Tufts DM**, Diuk-Wasser M. (2017). Novel enzootic transmission pathway for a tick-borne pathogen: vertical transmission in a mammalian host. Ecology and Evolution of Infectious Diseases 15th annual meeting (*poster*).
- Tufts DM**, Vicente S, Rynkiewicz E, Diuk-Wasser M. (2016). Infection and transmission dynamics of tick-borne pathogens in *Peromyscus leucopus* populations. Postdoc Research Symposium at Columbia University (*selected poster presentation*).
- Tufts DM**, Diuk-Wasser M. (2016). Tick-borne pathogen interactions in white-footed mice. New York City Parasitology Symposium at New York University (*oral presentation*).
- Tufts DM**. (2016). Scientific diversity: Essentials for excellence. Girls in Science, Technology, Engineering, and Mathematics (GSTEM) at New York University (*Invited Guest Speaker*).
- Tufts DM**, Gardner SL. (2016). Evolutionary analysis of larval *Taenia* spp. tapeworms from Mongolia using morphological and molecular techniques. The American Society of Mammalogists (ASM) 96th annual meeting (*oral presentation*).
- Tufts DM**, Rynkiewicz E, States S, Diuk-Wasser M. (2016). Infection and transmission dynamics of tick-borne pathogens in small mammal populations. Ecology and Evolution of Infectious Diseases 14th annual meeting (*Invited oral presentation*).
- Rynkiewicz E, **Tufts DM**, Vicente SS, Diuk-Wasser M. (2016). Increased transmission of *Babesia microti* when co-infected with *Borrelia burgdorferi* may be mediated by within-host immune trade-offs. Ecology and Evolution of Infectious Diseases 14th annual meeting (*poster*).
- Gardner SL, **Tufts DM**. (2014). Parasites of mammals; systematics, phylogenetics, and genetic diversification. Population Biology Symposium (*Invited Symposium Talk*).
- Tufts DM**, Natarajan C, Revsbech I, Projecto-Garcia J, Hoffmann FG, Weber RE, Fago A, Moriyama H, Storz JF. (2014). Sign epistasis and stepwise changes in hemoglobin-O₂ affinity in high-altitude pikas. Society for Molecular Biology and Evolution meeting, Puerto Rico (*Invited Symposium poster*).
- Storz JF, Natarajan C, **Tufts DM**, Projecto-Garcia J, Witt CC, Moriyama H, Weber RE, Fago A. (2014). Causes and consequences of nonadditive mutational effects in the functional evolution of vertebrate hemoglobins. International Oxygen-Binding and Sensing Proteins meeting, UK (*Invited Symposium Talk*).
- Fago A, Revsbech IG, Damsgaard C, **Tufts DM**, Projecto-Garcia Hoffmann FG, Moriyama H, Storz JF, Weber RE. (2014). Regulation of hemoglobin oxygen affinity in hibernating animals. International Oxygen-Binding and Sensing Proteins meeting, UK (*Invited Symposium Talk*).
- Tufts DM**, Projecto-Garcia J, Storz JF. (2013). Genetic differences in hemoglobin function between high and low altitude pika species. The American Society of Mammalogists (ASM) 93rd annual meeting (*oral presentation*).
- Tufts DM**, Projecto-Garcia J, Storz JF. (2012). Genetic differences in hemoglobin function between high and low altitude pika species. The Wildlife Society annual meeting (*poster*).

- Tufts DM**, Gardner SL. (2011). Potential host sharing of endoparasites in *Ochotona princeps*. Evolution annual meeting and the American Society of Mammalogists (ASM) 91st annual meeting (*poster*).
- Tufts DM**, Gardner SL. (2011). Endoparasite species of the North American pika (*Ochotona princeps*) from Colorado. Southwestern Association of Parasitologists (SWAP) 42nd annual meeting (*poster*).
- Tufts DM**, Bextine B. (2010). Identification and integration of picorna-like viruses in two insect species. School of Biological Sciences Graduate Student Symposium, University of Nebraska-Lincoln (***Invited Oral Presentation***).
- Spencer K, **Tufts DM**, Hunter W, Bextine B. (2009). *Solenopsis invicta* virus (SINV-TX5) extraction and introduction to the red imported fire ant. 57th Annual meeting of the Southwestern Branch of the Entomological Society of America (*poster*).
- Tufts DM**, Hunter WB, and Bextine B. (2009). Integration and location of picorna-like viruses in various insect taxa. 57th Annual meeting of the Southwestern Branch of the Entomological Society of America (*poster*).
- Bextine B, **Tufts DM**, Timmons C, Hunter WB, Marutani-Hert M. (2008). Development of a Potato Psyllid (*Bactericera cockerelli*) cell culture. First International Research Conference on Huanglongbing (*poster*).
- Tufts DM**, Bextine B. (2008) Identification and integration of picorna-like viruses in multiple insect taxa. Annual meeting of the Entomological Society of America, Reno Nevada and University of Texas at Tyler Science, Technology, Engineering, and Mathematics (STEM) meeting (*poster*).
- Tufts DM**, Hunter WB, Bextine B. (2008). Identification and Possible Integration of Picorna-like Viruses in Multiple Insect Taxa. Entomological Society of America Annual meeting (*oral presentation*).
- Spencer K, **Tufts DM**, Hunter WB, Bextine B. (2008). *Solenopsis invicta* virus (SINV-TX5) extraction and introduction to the Red Imported Fire Ant (*Solenopsis invicta*). University of Texas at Tyler Science, Technology, Engineering, and Mathematics (STEM) meeting (*poster*).
- Tufts DM**, Bextine B. (2008). Red Imported Fire Ants and single stranded RNA viruses: Can viruses contribute to the management of insect pests? University of Texas at Tyler's Faculty Research day (***Invited Oral Presentation***).
- Tufts DM**, Hunter WB, Bextine B. (2008). Discovery of a genetically different form of the *Solenopsis invicta* virus (SINV-1) in East Texas. Southwestern Branch meeting of the Entomological Society of America (*oral presentation*).
- Tufts DM**, Gunawan S, Bextine B. (2007). The role of *Bacillus* species as possible obligate symbionts in queen *Solenopsis invicta* (Hymenoptera: Formicidae) Hemolymph. Annual meeting of the Entomological Society of America (*poster*).
- Tufts DM**, Bextine B. (2007). Differentiation of monogyne and polygyne Red Imported Fire Ant (RIFA) colonies using SYBR[®] Green-based QRT-PCR. Southwestern Branch meeting of the Entomological Society of America (*poster*).

TEACHING EXPERIENCE

Courses Taught as Adjunct Professor

Introduction to Environmental Biology (UN2001), Ecology, Evolution, and Environmental Biology, Columbia University (Fall 2017; 3-credit hour undergraduate course; ~30 students)

Fundamentals in Biology (Life 120), School of Biological Sciences, University of Nebraska (Summer 2014; 4-credit hour undergraduate course; ~50 students)

Ecology and Evolution (BIOS 207), School of Biological Sciences, University of Nebraska (Fall 2014; 4-credit hour undergraduate course; ~30 students)

Courses Taught as Teaching Assistant

Fundamentals in Biology (Life 120L), School of Biological Sciences, University of Nebraska (Fall and Spring 2012-2014; 1-credit hour undergraduate course; ~50 students)

Cell Structure and Function (BIOS 102 recitation, Head TA), School of Biological Sciences, University of Nebraska (Fall and Spring 2010-2012; 1-credit hour undergraduate course; ~50 students)

Field Epidemiology (BIOS 452/852, ACE10 course), School of Biological Sciences, Cedar Point Biological Station, University of Nebraska (Summer 2010-2012; 4-credit hours undergraduate course; ~16 students per semester)

Ecology and Evolution (BIOS 207L), School of Biological Sciences, University of Nebraska (Spring 2010; 1-credit hour undergraduate course; ~50 students)

General Biology (BIOS 101L), School of Biological Sciences, University of Nebraska (Fall 2009; 1-credit hour undergraduate course; ~50 students)

Cell and Molecular Biology (BIOL 4102L), Department of Biology, University of Texas (Fall and Spring 2007-2008; 1-credit hour undergraduate course; ~50 students)

Cell Biology (BIOL 3134L), Department of Biology, University of Texas (Spring 2007; 1-credit hour undergraduate course; ~50 students)

General Biology I and II (BIOL 1106L, 1107L), Department of Biology, University of Texas (Fall and Spring 2006-2007; 1-credit hour undergraduate course; ~50 students)

Guest Lectures

Conservation Biology course at Columbia University (Spring 2018); lecture topic: *Conservation Genetics*

Graduate student Professionalism course at the University of Nebraska (Fall 2014); lecture topic included: *How to survive in graduate school* and lead discussion panel

Cell and Molecular Biology course at the University of Texas (Spring 2008-2009), lecture topics included: *Cell Death; DNA Replication, and Central Dogma*

Cell Biology course at the University of Texas (Fall 2007-2008); lecture topics included: *Cell Membranes; Cell-Cell Signaling; Golgi Complex; Cell Cycle*

Other

Dissertation and Defense Workshop for PhD and MS Students – Designed and lead a graduate student workshop at Columbia University 2018-2019

PROFESSIONAL DEVELOPMENT

Statistics and R – Harvard University online courses (May 5 – July 31, 2020)

Inference and modeling, linear modeling, Bioconductor, genome and genomics assays, high-performance computing for genomics

Statistics for the Basic Sciences – Columbia University (March 27 – May 15, 2020)

Introduction to the basic statistics commonly used in biomedical research labs and application

RADcamp 2018 – Columbia University (August 28 – August 30, 2018)

Interactive class on how to use Phylogenetic and Population genetic bioinformatics programs (RADseq, ipyrad, RAxML, etc.)

Reflective Teaching Seminar – Columbia University (January 24 – April 12, 2018)

Developed pedagogical practices to improve teaching style and efficiency

Data Science Workshop – Columbia University (September 2015)

Understanding and using R

STUDENTS MENTORED

Graduate Students

Beryl Kahn, Molecular Biology, 2018-2019 (Columbia University, **Master's co-advisor**)
Laura Plimpton, Molecular Biology, 2019-Present (Columbia University)
Dan Mathisson, 2018-Present (Columbia University)
Thomas Hart, 2017-Present (University of Albany)
Avriel Diaz, Molecular Analyses, 2019-Present (Columbia University)
Meredith VanAcker, Molecular Biology, 2016-Present (Columbia University)
Sophia Raithel, Molecular Biology and Genetics, 2017-2018 (Columbia University)
Angel Weng, Fieldwork and Molecular Biology, 2017-2018 (Columbia University)
Patricia Zhang, Molecular Biology, 2017-2018 (SUNY downstate)
Max McClure, Fieldwork and Molecular Biology, 2015-2018 (Columbia University, Medical Student)
Sara Zufan, Molecular Biology and Parasitology, 2016-2017 (Columbia University)
Christina Olbrantz, Biology, 2016-2017 (Columbia University)
Samantha Kay, Molecular Biology, 2015-2016 (Columbia University)
Elizabeth Racz, Molecular Parasitology, 2013-2015 (University of Nebraska)
Altangerel "Auggie" Tsogtsaikhan, Molecular Parasitology, 2013-2015 (University of Nebraska)
Sajeni Mahalingam, Biology, 2013, (McMaster University)
Inge Revsbech, Biology and Fieldwork, 2010-2012, (University of Nebraska, Aarhus University)
Jake Pruett, Molecular Biology, 2008, (University of Texas)

Undergraduates

Kevin Zhao, 2017-Present (Columbia University)
Alexandria Soldo, 2019 (Columbia University)
Rachael Kaplan 2018-2019 (Columbia University)
Nina Tang, 2017-2018 (Columbia University/Barnard Women's College)
Lauren Hayashi, 2017-2018 (Columbia University/Barnard Women's College, **Senior Thesis Advisor**)
Soyon Jun, 2016-2017 (Columbia University)
Elsbeth Kane, 2016-2017 (Columbia University, **Senior Thesis Advisor**)
Sarah Dube, 2015-2016 (Columbia University)
Daniella Khan, 2015 (Columbia University)
Alexandria Bilanas, 2014 (University of Nebraska)
Alex Lai, 2014 (University of Nebraska)
Paras Patel, 2013 (McMaster University)
Kyle Spencer, 2007-2008 (University of Texas)
Chelsey Swatsall, 2007-2008 (University of Texas)
Andrew Ambort, 2006-2007 (University of Texas)
Stanley Gunawan, 2006-2007 (University of Texas)

REFERENCES

Research References

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Teaching References

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