Alina Avanesyan, Ph.D.

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Summary

- ***Areas of expertise:*** evolutionary ecology, organismal biology, entomology, molecular biology
- ***Research experience:*** plant-insect interactions and insect biology (7 years); DNA barcoding, phylogenetics, and population genetics (6 years); immune mechanisms of host-parasite interactions in snail-trematode model (5 years)
- ***New methods developed:*** (a) PCR-based method for detecting plant DNA within grasshopper gut contents; (b) non-destructive method for estimating plant biomass change in grasses; (c) protocol for determining drosophila mating status by tissue dissection and isolation of spermathecae (*all published*)
- ***Publications, presentations:*** 17 peer-reviewed publications, 20 conference presentations, six invited talks
- ***Selected courses taught (lectures and/or laboratories):*** Invertebrate Zoology, Animal Behavior, Animal Ecology, Introductory Biology, Microbiology, Genetics and Cell Biology, Molecular Biology
- ***Course developed***: Animal Ecology, Animal Behavior, Human Ecology, Bioindication

Education

- **Ph.D.,** Biological Sciences (2014). University of Cincinnati. *Dissertation*: Native versus exotic grasses: the interaction between generalist insect herbivores and their host plants
- **Candidate of Science** (*Ph.D.-equivalent*), Biological Sciences (2002). Herzen State University, St. Petersburg, Russia. *Dissertation*: The effect of defense responses of snails on development of trematode partenitae (with a focus on the family Echinostomatidae)
- **Diploma**, Biology, Psychology, *cum laude* (1997). Herzen State University, St. Petersburg, Russia

Professional Experience

Postdoctoral Associate, Department of Entomology, University of Maryland, College Park (01/2018–present)

- Research on ecology and evolution of plant-insect interactions with a focus on novel associations between native and exotic species and their effect on natural and managed systems
- Current projects: (a) host plant usage of the potato leafhopper based on molecular markers for ingested plant DNA; (b) DNA barcoding in isopods; (c) biodiversity of agricultural drainage ditches; (d) herbivore resistance and tolerance in exotic grasses; and (e) external morphology and host plant usage of the invasive spotted lanternfly, using molecular approach, light microscopy and scanning electron microscopy.
- Mentored four students in DNA barcoding work

Genetics Instructor, Biology Department, Grand View University, Des Moines, IA (2016–2017)

- Taught upper-level Genetics and Molecular Biology laboratory courses for biotechnology majors

- Trained students in standard molecular biology techniques: DNA extraction, PCR, agarose gel electrophoresis, DNA ligation, transformation, restriction digest analysis, sequence analysis, etc.

Research Associate, Department of Entomology, University of Wisconsin-Madison (Spring/Summer 2016)

- Worked on biology and distribution of *Drosophila suzukii*: went on regular field trips in Wisconsin and Minnesota; performed fly collection, identification, lab assays, dissection
- Developed and published a method for determining fly mating status by isolating spermathecae
- Trained high school student in tissue dissection, microscopy, staining, and slide preparation

Research Assistant/Teaching Assistant, Department of Biological Sciences, University of Cincinnati (2009–2014)

- Worked on plant responses to herbivory and insect feeding preferences (dissertation project)
- Designed and conducted field trials on herbivory, greenhouse experiments, and lab insect assays
- Developed and published two new methods: (a) PCR-based method for detecting plant DNA within insect gut contents; and (b) nondestructive method for estimating plant biomass changes
- Performed DNA-based identification and phylogenetic analysis of forensically important flies
- Worked on plant population genetics: performed DNA extraction, PCR, setup sequence reactions
- Taught laboratory courses (Microbiology, Biology Laboratory, Genetics and Cell Biology)
- Went on multiple field trips in Ohio, Maryland, Montana, and Iowa

Researcher, Laboratory of Cell Biology in Culture, Institute of Cytology of the Russian Academy of Science, St. Petersburg, Russia (2008–2009, part-time)

- Worked on genetic variation and hybridization in littoral snails: performed tissue processing, DNA extraction, PCR, sequence analysis; co-managed database for snail hybridization project
- Trained two students in DNA extraction, PCR, and agarose gel electrophoresis

Visiting Research Scholar, Department of Biology, University of Northern Iowa (Spring 2008)

- Worked on phylogeography of North-American fiddler crabs populations: extracted genomic DNA, conducted PCR, gel electrophoresis; prepared sequence reactions

Instructor/Docent, Department of Zoology, Herzen State University, St. Petersburg, Russia (2002–2009)

- Taught lectures, laboratories and field courses in ecology, biology and invertebrate zoology
- Trained students in microscopy, species identification, invertebrate morphology, basic morphometric analysis, standard bioindication and biomonitoring methods, etc.
- Mentored a total of 11 undergraduate students in research on animal ecology

Research Assistant, Department of Zoology, Herzen State University, St. Petersburg, Russia (1997–2002)

- Worked on cellular immune responses of snails to infection by trematodes (dissertation project)
- Conducted collection, identification, maintaining snails in lab; estimated snail infection rates
- Performed histological analysis of parasite encapsulation by snail hemocytes; morphological analysis of trematode larvae development; snail tissue dissection and processing
- Identified and characterized snail hematopoietic tissue (previously not described)
- Trained three students in tissue processing, dissection, microscopy, and slide preparation

Peer-Reviewed Publications

Journal Articles

1. **Avanesyan, A.**, Lamp, W., Snook, K., and P. Follett. (2019) Short-term physiological response of a native Hawaiian plant, *Hibiscus arnottianus*, to injury by the exotic leafhopper, *Sophonia orientalis* (Hemiptera: Cicadellidae). Environmental Entomology XX(XX): 1-7, https://doi.org/10.1093/ee/nvy193
2. **Avanesyan, A.** (2018) Should I eat or should I go? Acridid grasshoppers and their novel host plants: potential for biotic resistance. Plants: Special Issue "Plants Interacting with other Organisms: Insects", 7(4), 83; https://doi.org/10.3390/plants7040083. Invited paper.
3. Guédot, C., **Avanesyan, A**., and K. Hietala-Henschell. (2018) Effect of temperature and humidity on the seasonal phenology of *Drosophila suzukii* (Diptera: Drosophilidae) in Wisconsin. Environmental Entomology, 47(6): 1365–1375.
4. Jaffe, B.D., **Avanesyan, A.**, Bal, H. K., Grant, J., Grieshop, M.J., Lee, J.C., Liburd, O.E., Rhodes, E., Rodriguez-Saona, C., Sial, A.A., Zhang, A., and C. Guédot (2018) Multistate comparison of attractants and the impact of fruit development stage on trapping *Drosophila suzukii* (Diptera: Drosophilidae) in raspberry and blueberry. Environmental Entomology, 47(4): 935–945.
5. **Avanesyan, A.,** Jaffe, B.D., and C. Guédot (2017) Isolating spermatheca and determining mating status of *Drosophila suzukii*: a protocol for tissue dissection and its applications. Insects: Special issue "Invasive Insect Species", 8(1), 32; doi:10.3390/insects8010032. Invited paper.
6. **Avanesyan, A.** and T.M. Culley (2017) Tolerance of native and exotic prairie grasses to herbivory by *Melanoplus* grasshoppers: application of a non-destructive method for estimating plant biomass changes as a response to herbivory. The Journal of the Torrey Botanical Society, 144(1):15-25.
7. **Avanesyan, A.**, and T.M. Culley (2015) Feeding preferences of *Melanoplus femurrubrum* grasshoppers on native and exotic grasses: behavioral and molecular approaches. Entomologia Experimentalis et Applicata. 157: 153-163.
8. Merritt, B.J., Culley, T.M., **Avanesyan, A.**, Stokes, R., and J. Brzyski (2015) An empirical review: Characteristics of plant microsatellite markers that confer greater levels of genetic variation. Applications in Plant Sciences 3 (8): 1500025.
9. **Avanesyan, A.**, and T.M. Culley (2015) Herbivory of native and exotic North-American prairie grasses by nymph *Melanoplus* grasshoppers. Plant Ecology. 216: 451-464.
10. **Avanesyan, A.** (2014) Plant DNA detection from grasshopper gut contents: a step-by-step protocol, from tissues preparation to obtaining plant DNA sequences. Applications in Plant Sciences 2 (2): 1300082.
11. Granovitch, A.I., Maximovich, A.N., **Avanesyan, A.V.**, Starunova, Z.I., and N.A. Mikhailova (2013) Micro-spatial distribution of two sibling periwinkle species across the intertidal indicates hybridization. Genetica 141 (7): 293-301.
12. Ataev, G.L., Dobrovolskij, A.A., **Avanessian, A.V.**, and E.S. Loker (2001) Germinal elements and their development in *Echinostoma caproni* and *Echinostoma paraensei* (Trematoda) miracidia. The Journal of Parasitology 87 (5): 1160-1164.
13. Ataev, G.L., **Avanessian, A.V.**, Loker, E.S., and A.A. Dobrovolskij (2001) The organization of germinal elements and dynamics of *Echinostoma* mother sporocyst reproduction (Trematoda: Echinostomatidae). Parazitologia 35 (4): 307-319. (In Russian)

Published Abstracts

1. **Avanesyan, A.** (2005) Cellular defense mechanisms of *Planorbis planorbis* and *Planorbarius corneus* snails. Journal of Ural Immunology 1 (4): 2. (In Russian)

2. **Avanesyan, A.,** and M.A. Gvozdev (2003) Epidemical importance of the pathogenic organism activity in water reservoirs. *In* Environment and Human Health: The complete Works of International Ecologic Forum, p. 30.
3. **Avanesyan, A.,** and M.A. Gvozdev (2003) Trematode infections of freshwater snails in small water reservoirs of Leningrad Area. The Journal of Infectional Pathology 10 (4): 8-9. (In Russian)
4. Ataev, G.L., Dobrovolskij, A.A., **Avanessian, A.V.,** and C. Coustau (2000) Significance of the amebocyte-producing organ of *Biomphalaria glabrata* snails (strains selected for susceptibility/resistance) in cellular response to *Echinostoma caproni* mother sporocysts infection. Bulletin of the Scandinavian Society for Parasitology 10 (2): 65.

Conference Presentations (*****undergraduate students)

1. **Avanesyan, A.**, and W. Lamp (2018) Use of molecular markers for plant DNA to determine host plant usage for potato leafhopper, *Empoasca fabae*. Annual Meeting of the Entomological Society of America: 2018 ESA, ESC, and ESBC Joint Annual Meeting, Vancouver, BC, Canada. Oral presentation
2. **Avanesyan, A.** (2018) Should I eat or should I go? Acridid grasshoppers and their novel host plants: implications for biotic resistance. Annual Meeting of the Entomological Society of America: 2018 ESA, ESC, and ESBC Joint Annual Meeting, Vancouver, BC, Canada. Poster presentation
3. **Avanesyan, A.** (2018) Should I eat or should I go? Acridid grasshoppers and their novel host plants: implications for biotic resistance. Postdoctoral Research Symposium. University of Maryland, College Park, MD. Poster presentation
4. Omanovic, E.*, Welsch, A.*, Graving, S.*, Christiansen, K.*, **Avanesyan, A.**, and I. Hazan (2017) Sequencing of GAPDH Gene in Cilantro and Rosemary. Annual Grand View Scholarship Symposium. Grand View University. Des Moines, IA. Poster presentation
5. Christofferson, D.*, Miller, R.*, Piatt, D.*, Backer, S.*, Reyes-Zuniga, K.*, **Avanesyan, A.**, and I. Hazan (2017) Sequencing the GAPDH Gene of *Rosmarinus officinalis*. Annual Grand View Scholarship Symposium. Grand View University. Des Moines, IA. Poster presentation
6. Geisinger, S.*, Jones, K.*, Sopher, K.*, Salazar-Klock, L.*, **Avanesyan, A.**, and I. Hazan (2017). Sequencing of GAPDH Gene in *Coriandrum sativum* (Cilantro). Annual Grand View Scholarship Symposium. Grand View University. Des Moines, IA. Poster presentation
7. Merritt, B.J., Culley, T.M., **Avanesyan, A.**, Stokes, R., and J. Brzyski (2015) An empirical review: Characteristics of plant microsatellite markers that confer greater levels of genetic variation. Botany 2015: Annual Meeting of the Botanical Society of America, Edmonton, Alberta, Canada. Poster presentation
8. Culley, T. M., and **A. Avanesyan** (2014) Estimating the tolerance of native and exotic grasses to grasshopper herbivory. Botany 2014: Annual Meeting of the Botanical Society of America. Boise, ID. Oral presentation
9. **Avanesyan, A**., and T. M. Culley (2014) Prevalence of exotic and native plant food in the gut contents of *Melanoplus femurrubrum* grasshoppers: molecular confirmation of diet. 5th annual Midwest Graduate Research Symposium. Toledo, OH. Oral presentation
10. **Avanesyan, A**., and T. M. Culley (2013) Plant DNA detection from grasshoppers' gut contents: method and applications. 61st Annual Meeting of the Entomological Society of America, Austin, TX. Oral presentation
11. **Avanesyan, A**., and T.M. Culley (2013) Interaction of native and invasive grasses with a generalist herbivore insect (Updated: results from 2012-2013). 98th Annual Meeting of the Ecological Society of America. Minneapolis, MN. Oral presentation

12. **Avanesyan, A**., and T.M. Culley (2013) Interaction of native and invasive grasses with a generalist herbivore insect. 4th Annual Midwest Graduate Research Symposium. Toledo, OH. Oral presentation
13. **Avanesyan, A.**, and T.M. Culley (2013) Feeding preferences of the generalist insect herbivore, *Melanoplus femurrubrum* grasshopper, on invasive and native plants. Entomological Society of America Annual Meeting, Eastern Branch. Lancaster, PA. Oral presentation
14. **Avanesyan, A.**, and T.M. Culley (2013) A comparison of *Miscanthus sinensis* and two native grasses in their resistance and tolerance to herbivory by a generalist insect. Ohio Invasive Plants Council Research Conference. Columbus, OH. Poster presentation
15. **Avanesyan, A.**, Stamper, T.I. , Timm, A., Wong, E., Dahlem, G.A., and R. DeBry (2010) Phylogenetic relationships of the *Sarcophagidae* (Diptera), using three mitochondrial loci (COI, COII, and ND4) and one nuclear locus (PER). Entomological Society of America Annual Meeting, San Diego, CA. Poster presentation
16. **Avanesyan, A.**, Stamper, T.I., and R. DeBry (2010) Infection rate of grasshoppers in Montana, parasitized by *Sarcophagidae* flies: a host range and parasite species determination. Graduate Poster Forum, University of Cincinnati. Poster presentation
17. Berendzen, P.B., Ophus, J.D., and **A. Avanesyan** (2007) A cross-cultural study of students' understanding of evolution. The nature of science and their need for cognition. 10th Russian-American Conference: Modern Concepts in Higher Education. Herzen State University, St. Petersburg, Russia. Oral presentation
18. Gvozdev, M.A., and **A. Avanesyan** (2006) Bioethical aspects of the development of aquaculture in Russia. 6th Annual Methodological Seminar: Issues and Prospects of Biological and Ecology Education. Herzen State University, St. Petersburg, Russia. Oral presentation
19. **Avanesyan, A.,** and G.L. Ataev (2001) The organization of the amebocyte-producing organ in different pulmonate snails. International Symposium: Animal Physiology, I. M. Sechenov Institute of Evolutionary Physiology and Biochemistry, St. Petersburg, Russia. Poster presentation
20. Ataev, G.L., Dobrovolskij, A.A., **Avanessian, A.V.,** and C. Coustau (2000) Significance of the amebocyte-producing organ of *Biomphalaria glabrata* snails (strains selected for susceptibility/resistance) in cellular response to *Echinostoma caproni* mother sporocysts infection. International Symposium: Ecological Parasitology at the Turn of the Millennium. Organized by the Russian Parasitological Society and the Scandinavian Society for Parasitology. St. Petersburg, Russia. Oral presentation

Upcoming presentations

1. **Avanesyan, A.**, and W. Lamp (2019) Feeding preferences of native acridid grasshoppers for novel host plants: a case study of biotic resistance. Entomological Society of America Annual Meeting, Eastern Branch. Blacksburg, VA. Oral presentation
2. **Avanesyan, A.**, and W. Lamp (2019) External morphology of the spotted lanternfly, *Lycorma delicatula*, and its association with insect host plants. Entomological Society of America Annual Meeting, Eastern Branch. Blacksburg, VA. Poster presentation
3. Kutz, D., **Avanesyan, A.**, and W. Lamp (2019) Drainage ditches as sources of beneficial spiders on farms: A closer look at plant-spider community associations. Entomological Society of America Annual Meeting, Eastern Branch. Blacksburg, VA. Oral presentation

Invited Talks

1. Avanesyan, A. (2019) Spotted lanternfly: information and update. Maryland Organic Food & Farming Association, Maryland Dept. of Agriculture, Annapolis, MD.

2. **Avanesyan, A**. (2018) Novel plant-insect associations: implications of the lack of coevolution. Department of Entomology, University of Maryland, College Park, MD; weekly seminar series. Seminar speaker.
3. **Avanesyan, A**. (2018) Ecology of invasive species, consequences on society. Department of Entomology, University of Maryland, College Park, MD; HONR208D class. Guest lecturer.
4. **Avanesyan, A**. (2016) Identifying and controlling spotted wing drosophila. Berry Field Day organized by Wisconsin Berry Growers Association. River Falls, WI.
5. **Avanesyan, A**., and T. M. Culley (2014) Interaction of generalist grasshoppers with native and exotic grasses: behavioral and molecular approaches. 62nd Annual Meeting of the Entomological Society of America, Portland, OR.
6. **Avanesyan, A**. (2008) Biology education in Russia. Biology Department, University of Northern Iowa, Cedar Falls, IA; weekly seminar series. Seminar speaker.

Non Peer-Reviewed Publications

Research Reports

1. **Avanesyan, A.,** Thurman C.L., and P.B. Berendzen (2008) Exploring effective methods of DNA extraction and the amplification of specific mtDNA and nDNA regions in fiddler crabs (*Uca*). Functional Morphology, Ecology and Animal Life Cycles 8: 15-20. (In Russian)
2. **Avanesyan, A.** (2005) Structural changes in the amebocyte-producing organ of *Biomphalaria pfeifferi* snails during *Echinostoma caproni* infection. Functional Morphology, Ecology and Animal Life Cycles 5: 102-106. (In Russian)
3. **Avanesyan, A.** and G.L. Ataev (2004) Hematopoiesis in gastropods. Functional Morphology, Ecology and Animal Life Cycles 4: 105-111. (In Russian)
4. Ataev, G.L., and **A. Avanesyan** (2000) Snail defense responses to infection by trematodes. Functional Morphology, Ecology and Animal Life Cycles, pp. 118-122. (In Russian)

GenBank Submission (*****undergraduate students)

- Backer, S.*, Christiansen, K.*, Christofferson, D.*, Geisinger, S.*, Graving, S.*, Jones, K.*, Miller, R.*, Omanovic, E.*, Piatt, D.*, Reyes-Zuniga, K.*, Salazar-Klock, L.*, Sopher, K.*, Welsch, A.*, **Avanesyan, A.**, and I. Hazan (2017) *Salvia rosmarinus* isolate rs *GAPC-2* gene, partial cds. Direct Submission, *GenBank* Accession no. MF074139

Grants and Awards

1. Maryland Agricultural Experiment Station, McIntire Stennis Forestry Research Program, co-PI with William Lamp, "Stylet morphology of the invasive spotted lanternfly: implications for host tree–associations and potential tree damage"; 2018-2019; $30,000
2. Maryland Specialty Block Grant Program, primary researcher, PI: William Lamp, "The invasive spotted lanternfly, *Lycorma delicatula*, and its specialty crop host plants: insect host usage at each developmental stage."; 2018-2020; $37,831
3. Postdoctoral Research Symposium. University of Maryland. 2nd place in Poster Competition. College Park, MD; 2018; $300
4. Planting Science Digging Deeper Fellowship. Botanical Society of America; 2017; $2000
5. Entomological Society of America. 1st place in Graduate Student Ten-Minute Paper Competition. Austin, TX; 2013; $175

6. Entomological Society of America. Eastern Branch. 2nd place in Ph.D. Student Oral Competition. Lancaster, PA; 2013; $200
7. Wieman Wendel Benedict Awards. Department of Biological Sciences, University of Cincinnati; 2013: $200; 2012: $600; 2011: $1200
8. Graduate Research Fellowship for Outstanding Incoming Ph.D. Students Department of Biological Sciences, University of Cincinnati; 2009; $3000

Courses Taught (*courses developed)

Department of Entomology, University of Maryland, College Park (Spring 2018; teaching assistant):
- Insect Biodiversity: The Good, The Bad and The Weird (laboratory; 3 units)
- Aquatic Entomology (laboratory; 3 units)

Biology Department, Grand View University (2016–2017; instructor of record):
- Genetics (laboratory; 4 units; 2016–2017)
- Molecular Biology (laboratory; 4 units; 2017)

Department of Biological Sciences, University of Cincinnati (2010–2014; teaching assistant):
- Biology Laboratory (laboratory; 4 units; 2011)
- Genetics and Cell Biology (laboratory; 4 units; 2013–2014)
- Elementary Microbiology for Health Professionals (laboratory; 4 units; 2012)
- General Microbiology Laboratory (laboratory; 4 units; 2010–2013)

Department of Zoology, Herzen State University, St. Petersburg, Russia (2002–2009; instructor of record):
- Introductory Biology (lectures, laboratory; 2003–2006)
- General Biology (lectures; 2002–2005)
- Ecology (lectures, laboratory, field course; 2005–2007)
- Human Ecology* (lectures; 2007)
- Animal Ecology* (lectures, laboratory; 2003–2009)
- Bioindication* (lectures; 2008)
- Animal Behavior* (lectures; 2004)
- Invertebrate Zoology (laboratory, field course; 2002–2003)

Published Course Materials

1. **Avanesyan, A.** (2003) Animal Ecology: Lecture notes. Herzen State University. St. Petersburg, Russia. 40 p. (In Russian)
2. **Avanesyan, A.** (2003) Animal Ecology: Lab assignments. Herzen State University. St. Petersburg, Russia. 15 p. (In Russian)

Mentoring (*high school students)

Department of Entomology, University of Maryland, College Park (Summer 2018 – present):
- Brock Couch
- Kevin Clements
- Nina McGranahan*
- Bryan Stancliff*

(*Term projects in DNA barcoding: isopod species identification, host plant DNA detection from insect guts, plant phylogenetics*)

Department of Entomology, University of Wisconsin-Madison (2016; term project):

- Claire Mattmiller*

(*Term project: determining mating status of the spotted wing drosophila using light microscopy and histological analysis*)

Department of Zoology, Herzen State University, St. Petersburg, Russia (2002–2009):

- Tanja Perminova
- Maria Lopatkina
- Natalia Shamkina
- Luba Komarova
- Julia Sackina
- Anastasia Arsenieva
- Ekaterina Shapkina
- Natalia Kogotkova
- Egor Silin
- Irina Potapova
- Alexandr Mogilev

(*Senior thesis research projects and term projects in animal ecology and animal behavior: ecological monitoring of aquatic populations, environmental analysis, analysis of animal social behavior, etc.*)

Professional Development

- Teaching and Learning Transformation Center, University of Maryland. Workshops (2018-2019):
  - Teaching Thinking: Strategies to Support Student Engagement and Metacognition (Feb 12, 2019)
  - Starting Off On the Right Foot: Promoting Positive Classroom Climate and Student Inclusion (Sep 21, 2018)
  - Creating Effective Course Designs (Sep 17, 2018)
- Bayesian Modeling for Socio-Environmental Data: a nine-day short course; The National Socio-Environmental Synthesis Center (SESYNC), Annapolis, MD (May 29-June 8, 2018)
- Digging Deeper Summer Professional Development: a five-day workshop; Biological Sciences Curriculum Study (BSCS), Colorado Springs, CO (July 23-27, 2017)
- Coursework in mathematics (19 credit hours, GPA 4.0): Calculus I, Calculus II, Calculus III, Matrices & Linear Algebra, Differential Equations & Transformations; Department of Mathematics, Iowa State University, Ames, IA (June 2014– May 2015).

Research Skills

- ***Molecular biology:*** DNA/RNA extraction, PCR (mitochondrial COI, COII, and ND4; nuclear PER, ITS-1, ITS-2, GAPDH, and RAPD marker; chloroplast *trn*L (UAA) and *rbc*L; plant microsatellite markers), agarose gel electrophoresis, DNA/RNA spectrophotometry, DNA purification; restriction digest analysis, DNA cloning; sequence analysis (editing, aligning, assembling, estimating sequence quality, determining gene structure, etc.), phylogenetic analysis; preparation of human chromosome spreads (using HeLa cancer cells)

- ***Cell biology*:** protein and enzyme assays (spectrophotometric, colorimetric methods), protein quantification, enzyme activity analysis; cell fractionation (isolating mitochondria and non-mitochondria fractions); morphological analysis of cell proliferation and differentiation (germinal cells), embryo development, cellular composition (invertebrates)
- ***Histology, microscopy, cellular immunology*:** dissection and tissue isolation, tissue processing, embedding techniques, sectioning tissue using a microtome, differential staining of tissue sections; light microscopy, slide preparation, cell size measurements; identification and characterization of hematopoietic tissue; measuring cell proliferation (by quantification of mitotic activity); morphological analysis of encapsulation of parasites by hemocytes (with a focus on formation of hemocyte aggregations, types of capsules, hemocyte layers in a capsule, adhesion and destruction of a parasite by hemocytes); morphometric analysis of insect mouthparts and tarsi; scanning electron microscopy
- ***Microbiology*:** aseptic/sterile techniques, culturing, staining (simple, Gram, acid-fast), KOH string test, microscopic examination of morphological characteristics of bacteria; isolation streaking, measuring cell density, bacteriophage titer analysis; MIC determination, testing for antibiotic sensitivity (dilution method, Kirby-Bauer test); metabolic tests, preparation of Winogradsky columns; complementation test with yeast (*S. cerevisiae*), bacterial conjugation (*E. coli*)
- ***Field/greenhouse work*:** species collection and identification (plants, invertebrates); animal rearing and maintenance of lab colonies (snails, insects); establishing plots, planting, setting up feeding assays; measuring plant biomass, cover, growth, leaf damage, insect food consumption and assimilation, etc.; multiple field trips in Ohio, Maryland, Montana, Iowa, Minnesota, Wisconsin, and Russia
- ***Data analysis, programming, computer skills*:** R (data analysis), Python (basic programming); Linux shell, Vim (basic usage); HTML/CSS; sequence analysis (various software)

Extension and Outreach

Outreach Activities

- Scientist Mentor and member of Master Plant Science Team (2017-present)
  Planting Science Program, www.plantingscience.org

Extension Newsletters

1. **Avanesyan, A.** and C. Guédot (2016) Exclusion barriers as a sustainable strategy for management of Spotted Wing Drosophila. Wisconsin Fruit News, 1(6).
2. **Avanesyan, A.** and C. Guédot (2016) Raspberry varieties and their infestation by *Drosophila suzukii*. Wisconsin Fruit News, 1(4).

Service

- Subject editor: Journal of Orthoptera Research (June 2018-present)
- Reviewer: PeerJ (2019); Molecular Phylogenetics and Evolution (2018); PLOS One (2018); Journal of Biogeography (2018); International Journal of Molecular Sciences (2018); Acta Oecologica (2018); Global Change Biology (2017, 2018); Biodiversity Data Journal (2017); Journal of the Kansas Entomological Society (2017); Journal of Orthoptera Research (2016, 2017)

4. Organizer and moderator of a symposium, “Novel plant-insect associations: interactions between exotic and native species”, *upcoming* Entomological Society of America Annual Meeting, Eastern Branch. Blacksburg, VA. (2019)

- Moderator, Grad 10-min: P-IE, Forestry; Annual Meeting of the Entomological Society of America: 2018 ESA, ESC, and ESBC Joint Annual Meeting, Vancouver, BC, Canada (2018)
- Judge for student presentations: Grad 10-min: P-IE, Behavior; Undergrad 10-min: SysEB, Annual Meeting of the Entomological Society of America: 2018 ESA, ESC, and ESBC Joint Annual Meeting, Vancouver, BC, Canada (2018)
- Planning committee member: research symposium organized by Office of Postdoctoral Affairs, University of Maryland, College Park (2018)
- Volunteer: Maryland Day, University of Maryland, College Park (2018)
- Organizer and moderator of section symposium, "Novel plant-insect associations: implications of the lack of coevolution", 62nd Annual Meeting of the Entomological Society of America, Portland, OR. (2014)
- Judge for poster forums: 4th Scholarship Symposium, Grand View University (2017); Undergraduate Research Poster Forum, University of Cincinnati (2014); 7th Annual Southwest Ohio District Science & Engineering Expo for students in grades 6–12 (2014)
- Volunteer: Southwest Ohio District Science & Engineering Expo Coaching Day (2014)

Media Coverage

- UMD researchers study plant responses to leafhopper injury. University of Maryland, Department of Entomology. News and Events. February 5, 2019.
- Protect or destroy? The role of native grasshoppers in their home habitats. By Dylan Kutz and Serhat Solmaz. University of Maryland, Department of Entomology. Seminar blog. December 13, 2018.
- Meet the Journal of Orthoptera Research newest subject editor! University of Maryland, Department of Entomology. ENTM Newsletter | Summer 2018. August 16, 2018.
- Grasshoppers are what they eat. New method to extract plant DNA from grasshopper guts improves understanding of plant-insect interactions. Botanical Society of America News, ScienceDaily, ScienceNewsline, Phys.org, EurekAlert! February 5, 2014.
- New technique of studying insect physiology through DNA extractions. By Jen Ellis. LabRoots. February 18, 2014.
- Gut instinct. By Manupriya. Down to Earth, a magazine of The Society for Environmental Communications, India. March 15, 2014.
- UC doctoral student researches grasshopper guts to determine feeding patterns. University of Cincinnati News Release. April 9, 2014.
- Flying foe? By Dama Ewbank. University of Cincinnati Research Magazine. November, 2010.
- UNI biology researcher works with Russian counterpart. UNI newsletter. May 13, 2008.

Society Membership

- Botanical Society of America
- Ecological Society of America
- Entomological Society of America
- The Orthopterists' Society