Elizabeth A. Machunis-Masuoka

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EDUCATION

2011 M.A. History (emphasis: Early Modern Period and History of Epidemics)
Department of History, Midwestern State University
Wichita Falls, Texas
Thesis Advisor: Dr. Sharon Arnoult
Thesis: *'The Fury of Pestilence Winged on the False Terrors of Contagion': The 1793 Philadelphia Yellow Fever Epidemic in Biological and Historical Context*

1997 Ph.D. Biology (specialization: Biochemistry)
Department of Biological Sciences, University of California at San Diego
La Jolla, California
Dissertation Advisor: Dr. Paul D. Saltman (deceased)
Dissertation: *The Effect of Heme Pocket Mutations on the Peroxidase Activity of Recombinant Sperm Whale Myoglobin*

1992 B.S. Microbiology (specialization: Medical Microbiology); magna cum laude
Department of Biology, The California State Polytechnic University
Pomona, California

PROFESSIONAL EXPERIENCE

Research Mentor, Welch Scholars 2017 – Present
Dept. of Chemistry/Physics, Midwestern State University, Wichita Falls, Texas
Undergraduate research in the fields of organic chemistry and biochemistry, medicinal chemistry, and the spread of antibiotic resistance

Instructor 2013 – Present
Dept. of Biology, Midwestern State University, Wichita Falls, Texas
Undergraduate Introductory Biology; Graduate courses in Virology, Research Ethics, Biomedical Ethics, Writing

Dept. of Chemistry/Physics, Midwestern State University, Wichita Falls, Texas
Biochemistry, General Chemistry

Contract Science Editor 2011 – 2013
American Journal Experts
Specialization: Microbiology, Virology, Infectious Diseases, Public Health, Environmental Science, Ecology, History, Public Policy, Social Sciences

Adjunct Professor of Biology and Chemistry 2009 – 2013
Depts. of Biology and Chemistry, Midwestern State University, Wichita Falls, Texas
Chemistry (Allied Health), Botany, Anatomy and Physiology I & II,
Principles of Biology II, Graduate Seminar in Virology

Graduate Assistant 2008 – 2011
Dept. of History, Midwestern State University, Wichita Falls, Texas
American History, Western Civilization, European History

Adjunct Professor of Biology 2006 – 2007
Dept. of Biology, Bridgewater College, Bridgewater, Virginia
Introductory Biology

Co-Director/Director, Distinguished Majors Program in Human Biology 2003 – 2006
Dept. of Biology, The University of Virginia, Charlottesville, Virginia
Interdisciplinary Fourth Year Capstone Seminar, Guided Senior Thesis
Responsible for all major advising and final approval of senior theses.

Faculty Lecturer 1997 – 2006
Dept. of Biology, The University of Virginia, Charlottesville, Virginia
Introductory Biology, Microbiology, Virology, Cell Biology, Structural Biochemistry,
Molecular Biology, Bioterrorism, Research Ethics, Human Biology

Freelance Editor 1997 – 2007
Contract work for various science publishing agencies.

GRANTS AWARDED

Machunis-Masuoka, Elizabeth, "Isolation and Characterization of Antivenom and Antimicrobic Compounds from Rattlesnake Master (*Eryngium yuccifolium* Michx.)." 2024 MSU Texas Intramural Grant. $2,694.

CONFERENCE PAPERS

The Mythmaker of the House of Austria: Rudolf II's *Kunstkammer* and the Vision of Imperial Majesty. *Phi Alpha Theta North Central-North East Texas Regional Conference*, Abilene Christian University, Abilene, Texas, 2011.

Ss. Cyril and Methodius, Church Slavonic, Vladimir the Saint, and the Christianization of Russia. *Southwest Social Science Association 19th Annual Meeting*, Houston, Texas, 2010. Also presented at the *Phi Alpha Theta North Central-North East Texas Regional Conference*, Austin College, Sherman, Texas, 2010.

Ashes, Ashes, We All Fall Down: Plague and the Great Fire of London, 1665-1666. *Phi Alpha Theta North Central-North East Texas Regional Conference*, University of North Texas, Denton, Texas, 2009.

Human Subjects Research. *The Second National Undergraduate Bioethics Conference*, The University of Virginia, Charlottesville, Virginia, 2000.

GUEST LECTURES

The Bat Whisperer: Bioterrorism, COVID-19 and why Nature is more to blame than Nurture. *Redwine Honors Program*. Invited Speaker. Midwestern State University, Wichita Falls, Texas, October 20, 2020.

It's Just a Cough—Until It's Not: The history, current epidemiology, and bioterrorism potential of human and avian influenzas. *Redwine Honors Program.* Invited Speaker. Midwestern State University, Wichita Falls, Texas, March 6, 2019.

Are Girls Smarter than Boys? What DNA Can and Can't Tell You. *Math, Science and U Girls Conference*. Midwestern State University, Wichita Falls, Texas, 2008.

Birds, Flu and People: Biology and Its Consequences. *Gooch/Dillard General Faculty Lecture Series*. The University of Virginia, Charlottesville, Virginia, 2006.

Hurricanes, Bird Flu, and Bioterrorism: Are we doomed? Science, Ethics, and Public Health in the Face of a Moving Target. *Bioethics Society Lecture Series*. The University of Virginia, Charlottesville, Virginia, 2005.

Containing Biological 'Fallout': Public Health Necessities vs. the Ethical Treatment of Individuals following the Release of Biological Weapons into a Civilian Population. *Bioethics Society Lecture Series*. The University of Virginia, Charlottesville, Virginia, 2003.

PANEL DISCUSSIONS

The Poverty of Dying. *Inclusion Now! Festival*. Midwestern State University, Wichita Falls Texas, April 2019.

Sins of Omission: Does Claiming Faith Allow a Physician to Walk Away from Those in Need? *Inclusion Now! Festival*. Midwestern State University, Wichita Falls Texas, April 2018.

Reformation and the Scientific Revolution. *Reformation 500 Celebration*. Midwestern State University, Wichita Falls, Texas, October 2017.

Research Misconduct. *Bioethics Society Lecture Series*. The University of Virginia, Charlottesville, Virginia, 2001.

STUDENT POSTERS/ABSTRACTS

Austin Groth and Elizabeth A. Machunis-Masuoka (2024) Extraction and Identification of Novel Antibiotics in Plant Matter Effective Against *Staphylococcus epidermidis* with further analysis of Antivenom Properties. 23rd Undergraduate Research & Creative Activity Forum, MSU Texas.

Joshua de Waal and Elizabeth A. Machunis-Masuoka (2024) Antimicrobial Activity of Historical Native American Medicinal Plants against *Escherichia coli* and Investigation of Associated Antivenom Activity. 23rd Undergraduate Research & Creative Activity Forum, MSU Texas.

Austin Groth and Elizabeth Machunis-Masuoka (2024) Extraction and Identification of Novel Antibiotics in Plant Matter Effective Against *Staphylococcus epidermidis*. Poster Presentation. Texas Microbe Virtual Research Symposium, Texas ASM, Fall 2024 (Abstract and Poster).

Joshua de Waal and Elizabeth Machunis-Masuoka (2024) Antimicrobial Activity of Historical native American medicinal Plants Against *Escherichia coli*. Poster Presentation. Texas Microbe Virtual Research Symposium, Texas ASM, Fall 2024 (Abstract and Poster).

Elizabeth Bocanegra-Nunez and Elizabeth A. Machunis-Masuoka (2023) Assessing the Correlation Between Underlying Genetic Diversity and Antimicrobial Resistance in Enteric Isolates Obtained from a Year-Long Sampling of Canada Geese (*Branta canadensis*). Poster Presentation. Spring 2023 Celebration of Scholarship, MSUTexas, April 19-20, 2023.

Joshua de Waal, Austin Groth, Jacob Turnbow, and Elizabeth A. Machunis-Masuoka (2023) Metabolic Plasticity Observed in Multi-Drug Resistant Enteric Bacteria Obtained as Part of a Year-Long Study of Canada Geese (*Branta canadensis*). Poster Presentation. Spring 2023 Celebration of Scholarship, MSUTexas, April 19-20, 2023.

Dylan Graupmann and Elizabeth A. Machunis-Masuoka (2023) The Transmission of Multi-Drug Resistant Enteric Bacteria Between Migrant and Non-Migrant Populations of Waterfowl. Poster Presentation. Texas ASM Spring Branch Meeting, Abilene Christian University, March 24-25, 2023.

Elizabeth Bocanegra-Nunez, Zaniya Medlin, Elizabeth A. Machunis-Masuoka, and James Masuoka (2023) Tracing Antimicrobic Resistance and Virulence Factors of Enteric Bacteria Obtained from a Year-Long Sampling of Canada Geese (*Branta canadensis*). Poster Presentation. Texas ASM Spring Branch Meeting, Abilene Christian University, March 24-25, 2023.

Joshua de Waal, Austin Groth, Jacob Turnbow, and Elizabeth A. Machunis-Masuoka (2023) Metabolic Plasticity Observed in Multi-Drug Resistant Enteric Bacteria Obtained as Part of a Year-Long Study of Canada Geese (*Branta canadensis*). Poster Presentation. Texas ASM Spring Branch Meeting, Abilene Christian University, March 24-25, 2023.

Amy Arceneaux, Teresa Vu, Elizabeth Machunis-Masuoka. (2020) Antibiotic Resistance Correlates with Higher Levels of Genetic Diversity in *E. coli* Isolates Obtained from Migratory and Resident Bird Populations Associated with a Small Community Lake. *American Society for Microbiology Texas Branch Meeting*. (Cancelled due to the SARS-CoV-2 pandemic.) Poster Presentation.

Teresa Vu, Amy Arceneaux, Elizabeth Machunis-Masuoka, James Masuoka. (2019) Antibiotic Resistance and Underlying Genetic Diversity in *Escherichia coli* isolates from Migrant and Resident Bird Populations in a Small Community Lake. *Gamma Sigma Epsilon Society Conference*.

THESIS COMMITTEES

William Krogman (2016) **Potential adaptive advantages of the ontogenetic transition of conspicuously colored tails to a cryptic morphology in the skink *Plestiodon fasciatus***

Ibtissem DeRouiche (2018) **Cell Surface Hydrophobicity of *Candida albicans* Upon the Release of Cell Wall Proteins by Dithiothreitol Treatment**

Jonathan Ford (2019) **Detection of a Fas-L-Like Protein in *Candida albicans***

Esther Adenike Opoola (2021) **Analysis of the *W14-5200* mutation in albino maize seedlings**

Jordan Paige Cannedy (2021) **An analysis of nicotine metabolism and the effect of nicotine concentration on hatch success, survivorship, growth rate, and metabolic rate in the tobacco hornworm, *Manduca sexta***

Reid Armstrong, **Comparative Analysis of Fatty Acids Within Species of Spiders Found in North Texas** (Student opted for MA and graduated)

James Denton, **Utilization of Amber Suppression to Determine the Substrate Binding Sites on Membrane Protein Chaperone** (Student has left the program)

Merina Guiste (2024) **A Comparison of Oxygen-Regulated Metabolic Adaptations in *Escherichia coli* Using a Lung Mucus Model**

Anastasia Guseva (2025) **Effect of hydric stress on *Juniperus virginiana* (Eastern Red Cedar) leaf microbiome diversity**

Tenzin Shakya (2025) **Investigating the Mechanisms of *Candida albicans* Survival in the Presence of the Human Gut Bacterium *Escherichia coli***

Dalton Penick (In progress)

Pan Nihof (In progress)

PUBLISHED WORKS

Bauman, Robert W., *Microbiology with Diseases by Body System* 3/E, Clinical Consultants Cecily D. Cosby, Janet Fulks, and John M. Lammert, Contributions by **Elizabeth Machunis-Masuoka** and Jean E. Montgomery (Pearson Education publishing as Benjamin Cummings, 2011).

Bauman, Robert W., Mindy Miller-Kittrell, and **Elizabeth Machunis-Masuoka**, *Study Guide for Microbiology with Diseases by Body System* 3/E (Pearson Education publishing as Benjamin Cummings, 2011).

Machunis-Masuoka, Elizabeth. "Resources as a source of international conflict." In *Encyclopedia of Global Resources*, ed. Craig W. Allin. Pasadena: Salem Press, 2010.

Machunis-Masuoka, Elizabeth. "Antibiotics." In *The Forties in America*, ed. Thomas Tandy Lewis. Pasadena: Salem Press, 2010.

Machunis-Masuoka, Elizabeth. "Arctic Seafloor Claims." In *Encyclopedia of Global Warming*, ed. Steven I. Dutch. Pasadena: Salem Press, 2009.

Machunis-Masuoka, Elizabeth. "Stanley Norman Cohen." In *Great Lives from History: Inventors & Inventions*, ed. Alvin K. Benson. Pasadena: Salem Press, 2009.

Machunis-Masuoka, Elizabeth. "Raymond Damadian." In *Great Lives from History: Inventors & Inventions*, ed. Alvin K. Benson. Pasadena: Salem Press, 2009.

Machunis-Masuoka, Elizabeth and Cecie Starr, *Instructor's Resource Manual for Starr and McMillan's Human Biology* 7/E (Thomson, Brooks/Cole, 2007).

MANUSCRIPTS IN PREPARATION

Teresa Vu, Amy Arceneaux, Shayla Eaklor, Jordan Gardner, Qianying He, Yaning Liu, Elizabeth Machunis-Masuoka, James Masuoka. Antibiotic Resistance and Underlying Genetic Diversity in *Escherichia coli* isolates from Migrant and Resident Bird Populations in a Small Community Lake

Elizabeth A. Machunis-Masuoka. 'The Hundred Tongues of Rumour': Concepts of Racial Immunity and Resistance in the Historiography of Yellow Fever (working title; monograph)

STUDENT ORGANIZATIONS

Current Faculty Mentor: COAL (Coalition of Anime Lovers), Midwestern State University

AWARDS

Forrest D. Monahan Jr. Award, 2010-2011
Phi Alpha Theta Tau Gamma Scholarship, 2010-2011
Ben H. Proctor Research Award, European History, 2010 (For "Ss. Cyril and Methodius…")
Floyd E. Ewing Fellowship, 2009-2010

MEMBERSHIPS

The American Chemical Society, current member
Phi Alpha Theta History Honor Society, past member
The American Society for Microbiology (Virginia Branch), past member

COURSES PREVIOUSLY TAUGHT

University of Virginia

- **Introductory Biology Laboratory:** Required pre-medical introductory biology laboratory course covering molecular and biochemical techniques. Taught lectures and supervised graduate TAs who taught the laboratory sections. General class size: 600+ students.

- **General Microbiology:** Survey course for majors and non-majors; microbial physiology, disease ecology, evolution, epidemiology. Lecture only. General class size: 150-200 students.
- **Virology:** Upper-level majors course; molecular structure, molecular biology, function and evolution of animal viruses; sub-sections on epidemiology and public health. Lecture only. General class size: 150-200 students.
- **Molecular Biology Laboratory:** Part of rotating upper-level core modular laboratory series for majors; basic molecular techniques, experimental design, data analysis. Lecture and laboratory combined. General class size: 20 students.
- **Cell Biology:** Core course for majors; structure and function of the eukaryotic cell with emphasis on cell signaling and development. Lecture only. Summer session class size: 20-30 students.
- **Senior Seminar on Protein Structure and Evolution:** Course examined primary literature with emphasis on the study of structural change and conservation in proteins as these properties relate to function and evolution. General class size: 10 students.
- **Senior Seminar on Research Ethics:** Course examined primary literature and case studies addressing concepts of scientific integrity (fraud, fabrication, conflicts of interest), human and animal research policies, informed consent. General class size: 10 students.
- **Senior Seminar on Bioterrorism (Biology, Ethics and Policy):** Course examined the 6 major biological agents, their public health ramifications, effective response policy, ethical concepts of distributive justice, rationing, quarantine, and major US policies that shape our response capabilities. Capstone event was a live-action war game modeling a mock bioterrorism event on US soil. General class size: 10-15 students.
- **Human Biology and Disease:** General anatomy and physiology course with an infectious disease focus; course based on an integrative systems approach to the body, its structure, and its function using disease as a model. Course included non-majors and pre-nursing students. Lecture only. General class size: 100-150 students.
- **Fourth Year Capstone Seminar for Human Biology Distinguished Majors:** Seminar blended lectures in the sciences with corresponding lectures on law, ethics and policy to illuminate the merging of these disciplines in our everyday lives. Enrolled students were concurrently enrolled in senior thesis and at the end of the senior year students defended their senior theses in a public symposium. Class size was dependent on the number of students in the program, generally 10-12.

Bridgewater College

- **Introductory Biology and Laboratory:** General biology course required of all students enrolled in the college; combination of field biology and laboratory techniques covering everything from using dichotomous keys to identify tree species to antibiotic susceptibility. All students had to do group independent projects and present them to the class. Taught both the lecture and the labs. Class size: 30-40.

Midwestern State University

- BIOL 1103 Introduction to Biology Lab
- BIOL 1114 Life I: Molecular and Cell Concepts
- BIOL 1214 Life II: Evolution and Ecology
- BIOL 1134 Anatomy and Physiology I
- BIOL 1234 Anatomy and Physiology II
- BIOL 1544 General Botany
- BIOL 3054 Principles of Biology I

- BIOL 3064 Principles of Biology II
- BIOL 3314 General Microbiology
- BIOL 4001 Seminar in Biology
- BIOL 4143/5143 Evolution and Systematics
- BIOL 5012 Writing for the Biological Sciences (Graduate)
- BIOL 5803 Virology
- BIOL 5813 Biomedical Ethics
- BIOL 5801 Research Ethics
- CHEM 1103 (prior to restructuring of chemistry required for nursing)
- CHEM 1143 General Chemistry 1st Semester
- CHEM 1141 General Chemistry 1st Semester Lab
- CHEM 1243 General Chemistry 2nd Semester
- CHEM 1241 General Chemistry 2nd Semester Lab
- CHEM 2011 Organic Chemistry 2nd Semester Lab
- CHEM 4242/BIOL 5242 Biochemistry Lab
- CHEM 4243/BIOL 5243 Biochemistry Lecture
- HIST1333 Survey of Western Civilization
- Honors Seminar: Bioterrorism